MARINE MAMMAL COMMISSION

Annual Report to Congress

1994

Marine Mammal Commission
1825 Connecticut Avenue, N.W.
Washington, D.C. 20009

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EXECUTIVE SUMMARY

This is the 22nd Annual Report to Congress of the Marine Mammal Commission and its Committee of Scientific Advisors on Marine Mammals. The Commission, established under Title II of the Marine Mammal Protection Act of 1972, provides policy and programmatic guidance on Federal activities, both domestic and international, affecting marine mammal conservation.

The purpose of the Annual Report is to provide timely information on relevant issues and events to Congress and to appropriate Federal and state agencies, public interest groups, the academic community, private citizens, and the international community. When combined with previous reports, it provides a historical record of progress in identifying and resolving issues related to the conservation of marine mammals and their habitats. To ensure factual accuracy, the draft report was provided to representatives of fifteen Federal and state agencies as well as other involved persons for comment prior to publication. A summary of the report's contents is provided below.

Introduction (Chapter I)

Members of the Commission, its Committee of Scientific Advisors on Marine Mammals, and staff are listed in this chapter, as is a brief summary of the Commission's recent appropriations history.

Reauthorization of the Marine Mammal Protection Act and Related Legislation (Chapter II)

On 30 April 1994 the President signed into law the Marine Mammal Protection Act Amendments of 1994 reauthorizing the Act through fiscal year 1999. Among other things, the amendments provide for the taking of marine mammals incidental to commercial fishing operations under a new regime based in part on guidelines developed by the Marine Mammal Commission, legislation proposed by the National Marine Fisheries Service, and a proposal provided by fishing industry and environmental groups. Under the amendments, all marine mammal stocks in U.S. waters are being assessed to provide a scientific basis for determining which will be classified as "strategic stocks" and have take reduction plans prepared. The amendments also direct the National Marine Fisheries Service to assess interactions between pinnipeds and certain fishery resources and, where the effects on depleted salmonid stocks are particularly acute, to authorize lethal removal of pinnipeds. Other amendments revise certain requirements pertaining to public display and scientific research permits and add new permit categories for commercial and educational photography and the importation of hides and skulls

of polar bears shot by U.S. citizens in Canada. The amendments, as well as the legislative process leading to their enactment, are discussed briefly in this chapter and elsewhere in this report; they are reviewed in detail in Appendix D.

Principles for Wildlife Conservation (Chapter III)

In 1978 the results of efforts to develop principles to conserve wildlife were published as "New Principles for the Conservation of Wild Living Resources" by Sidney J. Holt and Lee M. Talbot. Since then, human-caused pressures on many species of wildlife — plant and animal, marine and terrestrial — have increased, as has the body of scientific and technological knowledge applicable to wildlife conservation. Recognizing these facts and that implementation of the 1978 principles has been limited, the Marine Mammal Commission decided to review the 1978 paper and other more recent information to develop more effective principles for guiding wildlife conservation. To this end, the Commission contracted for consultations with scientists and managers from more than 30 countries and held an international workshop on the subject in 1994. The results of the consultations and workshop, to be published in the spring of 1995, will update and refine principles in the 1978 paper and provide guidance for implementing them.

Consistent with its obligation to focus on habitat and ecosystems, the Commission also contracted in 1994 for a review of selected fisheries agreements to try to identify points for incorporation into future agreements to assure ecologically sound approaches to the conservation of species and stocks of fish and marine mammals and their ecosystems.

Species of Special Concern (Chapter IV)

Each year the Marine Mammal Commission devotes attention to certain marine mammal species and populations with special conservation needs. This chapter describes efforts by the Commission and others to conserve sixteen species, including Florida manatees, Hawaiian monk seals, Steller sea lions, northern right whales, and Gulf of Maine harbor porpoises.

West Indian Manatee — The Florida population of West Indian manatees is classified as endangered and as depleted. Its situation is grave. In 1994, 194 animals were found dead, at least 51 of which died of injuries received from boats. The number of recorded deaths, surely fewer than what actually occurred, approached record high levels; it is, because of the small population size, of serious concern. Late in the 1970s the Commission was instrumental in starting a recovery program now led by the Fish and Wildlife Service and the State of Florida with support from many other government agencies, industry groups, and private organizations. In 1994 the Commission continued to provide advice on many issues, and it played a central role in updating the Florida Manatee Recovery Plan.

In 1989 Florida expanded its efforts to reduce the number of manatees killed by boats and to protect manatee habitat by limiting boat speeds in 13 counties and by acquiring additional manatee habitat for protected area systems. By the end of 1994 speed zone rules for all but one county had been adopted, but because of delays in posting signs and enforcing rules, it is too

soon to judge their effectiveness. With respect to the need for manatee habitat acquisition, the Commission identified important areas in two major reports. In 1994 a large area along Crystal River, perhaps the most important habitat that the Commission had recommended for acquisition, was purchased by the State of Florida.

Also discussed in this chapter is the record high number of manatees that were killed in floodgates and navigation locks in south Florida in 1994. In response, the Army Corps of Engineers and the South Florida Water Management District accelerated work to design and install pressure-sensitive, gate-reversing mechanisms on gates where animals had been killed.

Hawaiian Monk Seal — The Hawaiian monk seal is the most endangered seal in U.S. waters. Found only in Hawaii and numbering something more than 1,200 animals, it breeds almost exclusively at six small atolls scattered across 1,200 miles in the Northwestern Hawaiian Islands. The principal known threats include disturbance from humans, interactions with commercial fisheries, and changes in prey availability. In the past five years, numbers have decreased by about 25 percent and the population's decline continues. While the reasons for the decline are not clear, it is apparent that the species will become extinct if the decline cannot be stopped.

As a result of its 1994 review of the National Marine Fisheries Service's monk seal program, the Commission recommended that the Service bring program support to an acceptable level, that it expand work to rehabilitate underweight pups likely to die, that it determine why survival rates and weights of juvenile seals at the species' largest breeding colony have been decreasing sharply, and that it make further efforts to control aberrant behavior of those adult males killing females and juveniles. The Commission also recommended that the Navy, which is closing its Naval Air Station on the Midway Islands, transfer the Islands to the Fish and Wildlife Service for use as a National Wildlife Refuge, that it clean up toxic wastes and debris fouling beaches on the Islands, and that it provide for the restoration of a viable monk seal breeding colony, since the Islands had supported such a colony before the Navy occupation which started in World War II.

Steller Sea Lion — Steller sea lions, found around the North Pacific rim from California to Japan, have declined in number by more than 75 percent since the 1960s. In U.S. areas, they declined from nearly 200,000 animals in the 1960s to slightly more than 50,000 in 1994, and in western Alaska, where the largest colonies occur, declines at some major rookeries have exceeded 90 percent. In 1994 the decline continued unabated for reasons that are not well understood. Incidental take by commercial fisheries and deliberate shooting of sea lions were a factor in the past, but these have now been reduced to low levels. Competition from commercial fisheries for sea lion prey species could be a factor.

In 1994 the National Marine Fisheries Service continued reviewing the species' threatened status to determine if it should be reclassified as endangered. As recommended by the Marine Mammal Commission, the Service reconvened the recovery team to provide advice on this and other recovery needs. The Commission also took steps to update its Steller sea lion

species account to help synthesize new information and advice on recovery needs. These and other matters are discussed in this chapter.

Northern Right Whale — The most endangered marine mammal in U.S. waters is the northern right whale, a species reduced to near-extinction by commercial whaling. The largest population, and perhaps the only one with a chance of recovery, numbers about 300 animals and occurs seasonally along the east coast of the United States and Canada. It does not appear to be increasing, and mortality due to ship collisions and entanglement in fishing gear, and perhaps disturbance by vessel traffic, impair recovery prospects.

At the Commission's urging, the National Marine Fisheries Service published a recovery plan in 1991 and in 1994 designated three areas, two off Massachusetts and one off Georgia, as critical habitat. The area off Georgia includes the only known calving ground for northern right whales. Late in 1994 the Service formed a team, which includes a representative from the Commission, to help implement measures to protect whales on their summer feeding grounds off Massachusetts and Canada. A full discussion of right whales and efforts to protect them is found in this chapter.

Gulf of Maine Harbor Porpoise — Harbor porpoises, found seasonally in coastal waters from the northern Bay of Fundy in Canada to North Carolina, are caught incidentally in coastal gillnet fisheries principally in New England and Canada and to a lesser extent off the mid-Atlantic states. Available information suggests the porpoise bycatch may have exceeded sustainable levels since the 1970s. Discussed in this chapter are the placement, starting in 1990, of observers to monitor bycatch on a subset of gillnet fishing boats; porpoise population surveys done in 1991 and 1992; a pending proposal to list the Gulf of Maine harbor porpoise population as threatened; a study of net-mounted sound sources to repel porpoises from gillnets; and time-area fishery closures put in place in the spring of 1994 to reduce incidental take. The closures, intended to reduce porpoise bycatch by 20 percent, were the first step in a four-year take reduction program recommended by the New England Fishery Management Council. Also discussed are a 1994 estimate of the potential biological removal level (516 animals) for the entire population and the Commission's recommendations in late 1994 that the Service undertake another harbor porpoise population survey in 1995, immediately constitute a harbor porpoise incidental take reduction team, and with the New England Fishery Management Council develop strengthened time-area closures that can be implemented by the summer of 1995.

Marine Mammal-Fisheries Interactions (Chapter V)

Marine mammals are caught and killed incidentally in some commercial fisheries. They also may damage or destroy fishing gear, take fish from nets and lines, and compete with fishermen for fish and shellfish. In some cases, fishermen may shoot marine mammals to protect themselves, their gear, and their catch. This chapter describes provisions of the 1994 amendments to the Marine Mammal Protection Act to establish a new regime to govern such interactions and steps that have been taken to implement it. Among other things, it describes what the National Marine Fisheries Service and the Fish and Wildlife Service, in consultation

with the Marine Mammal Commission, have done this year to assess the status of marine mammal stocks in areas under U.S. jurisdiction, and to estimate numbers that could be taken from each stock without causing it to be reduced or maintained for a significant length of time below its maximum net productivity level.

Since the mid-1970s there have been dramatic declines in the numbers of Steller sea lions, northern fur seals, harbor seals, and several species of seabirds in parts of the Bering Sea and the Gulf of Alaska. This chapter describes efforts by the Commission and others to determine the cause of these declines.

One issue that led to the Marine Mammal Protection Act was the death of hundreds of thousands of dolphins each year in the eastern tropical Pacific Ocean in the purse seine fishery for yellowfin tuna. Due to actions described in this chapter, dolphin mortality and injury in this fishery have been reduced dramatically.

Several species and stocks of anadromous fish in the Pacific Northwest have been severely depleted by overfishing and habitat degradation and loss. Predation on the remnant stocks by growing populations of California sea lions and harbor seals may be exacerbating declines and may be interfering with the recovery of some stocks. Perhaps the best known example is the decrease in the number of steelhead trout returning through the Ballard Locks in Seattle to spawn in the tributaries of Lake Washington, and the concurrent increase in the number of California sea lions observed preying on steelhead trout at the locks. Steps taken to assess and determine how best to prevent or mitigate these interactions are described in this chapter.

International Aspects of Marine Mammal Protection and Conservation (Chapter VI)

The Marine Mammal Protection Act directs the Commission to advise the Secretary of State and other Federal officials on international policies and activities affecting the conservation of marine mammals and their habitat. To further these objectives, in 1994 the Commission published *The Marine Mammal Commission Compendium of Selected Treaties, International Agreements, and Other Relevant Documents on Marine Resources, Wildlife, and the Environment*; made recommendations to the Department of State on the draft of an agreement to govern the exploitation of highly migratory fish stocks and fish stocks that straddle the high seas and areas under the jurisdiction of coastal nations; provided advice to the U.S. Commissioner to the International Whaling Commission on matters related to other countries' whaling; worked with the Department of State, the National Oceanic and Atmospheric Administration, the National Science Foundation, and other Federal agencies and non-governmental organizations to further conservation of marine mammals and other components of the Antarctic marine ecosystem; worked with Alaska Native groups, the Department of State, and other Federal agencies to implement the Arctic Environmental Protection Strategy adopted by eight Arctic nations in 1991; advised the Fish and Wildlife Service and the Department of State on measures needed to conserve the two polar bear populations that the United States

shares with Canada and Russia; and worked with the Fish and Wildlife Service on marine mammal issues considered during the November 1994 Conference of Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora. These and related activities are discussed in this chapter.

Marine Mammal Strandings and Die-Offs (Chapter VII)

This chapter describes efforts to determine the causes and significance of unusual marine mammal mortality events, which have become more common around the world in the past 25 years. Two significant events occurred in the United States in 1994. One involved the deaths of at least 220 bottlenose dolphins along the Texas coast, apparently caused by the same virus or type of virus that killed more than 1,000 striped dolphins in the Mediterranean Sea in 1990-1991. The other involved at least 46 common dolphins that died in central California of unknown causes.

Much of what is known about marine mammal biology has been learned from studies of stranded animals. Following a 1977 Commission-sponsored workshop, the National Marine Fisheries Service established and now coordinates a nationwide system of regional networks of volunteers to investigate strandings of live and dead marine mammals. The system has been greatly improved in recent years and, in 1993, the latest year for which data are available, participants reported strandings of 1,210 cetaceans and 2,671 pinnipeds on U.S. beaches.

The National Marine Fisheries Service has also formed an independent working group, as directed by the Marine Mammal Health and Response Act of 1992, to provide expert advice on ways to better detect and respond to unusual mortality events. In 1994 the working group, which includes a Commission representative, advised on developing a national contingency plan for responding to unusual mortality events and on criteria for deciding when rehabilitated marine mammals can be released without risk to either the released animals or the wild populations.

Impacts of Marine Debris (Chapter VIII)

Lost and discarded nets, rope, fishing traps, plastic bags, bottles and other marine debris kill and injure marine mammals and many other species. Debris also adversely affects human health and safety and causes economic damage and aesthetic degradation. As information on increasing impacts came to light in the early 1980s, the Commission assumed a lead role domestically and internationally in calling attention to the problem and in helping to identify and eliminate the causes. In 1994 a Commission-supported review documented interactions between marine debris and 41 percent of the world's marine mammal species, 43 percent of the world's seabird species, and all but one sea turtle species.

In 1994 the Commission also provided partial support for the Third International Conference on Marine Debris held in May 1994, presented the results of its review at the Conference, helped the National Marine Fisheries Service plan the 1995 Marine Entanglement Research Program, encouraged the National Marine Fisheries Service to assess the feasibility

of cleaning up derelict commercial fishing gear at sea, helped assess plans for a national marine debris monitoring system to provide feedback on the effectiveness of mitigation measures, and took part in international meetings on marine debris problems in the Wider Caribbean Region, including the Gulf of Mexico. These and other actions to reduce marine debris pollution are summarized in this chapter.

Marine Mammal Management in Alaska (Chapter IX)

With benefit of extensive consultations with the Marine Mammal Commission, Alaska Native groups, the State of Alaska, and others, the Fish and Wildlife Service adopted final conservation plans for walruses, polar bears, and sea otters in 1994. Also in 1994 the Commission updated its harbor seal species account and published a new account on killer whales.

One element of the walrus, polar bear, and sea otter conservation plans is a marking and tagging program to help detect illegal trade in skins and tusks and to gather information on subsistence harvests. Data compiled through this program indicate an increase in sea otter harvests in the past three years, a decrease in walrus harvests in the past four years, and an increase in the 1992-1993 polar bear harvest. The Commission has suggested that the National Marine Fisheries Service either develop a similar program for certain Alaska seal species or that it enter into cooperative agreements with Native organizations to obtain data on their subsistence harvests.

Outer Continental Shelf Oil and Gas Exploration and Development (Chapter X)

Marine mammals may be affected directly or indirectly by oil spills, routine discharges, noise, vessel traffic, and other environmental perturbations caused by activities associated with offshore oil and gas exploration and development. The Minerals Management Service, the National Marine Fisheries Service, and the Fish and Wildlife Service share responsibility for ensuring that such activities do not adversely affect marine mammals, their habitat, or their availability for subsistence use by Alaska Natives. In 1994 the Commission commented on a draft environmental impact statement by the Minerals Management Service assessing the possible effects of proposed Outer Continental Shelf lease sales in the central and western Gulf of Mexico. It also provided information to the Service on marine mammal-related issues for use in assessing the possible effects of contemplated new lease sales in the Gulf of Mexico and the Chukchi Sea, including a proposed joint U.S.-Russian lease sale.

The take of at least some marine mammals, principally by harassment, is an unavoidable consequence of offshore exploration and development activities in some areas. As discussed in this chapter, the Secretaries of Commerce and the Interior, in consultation with the Marine Mammal Commission, have promulgated regulations pursuant to section 101(a)(5) of the Marine Mammal Protection Act authorizing the taking of eight species of marine mammals incidental to oil and gas exploration and development activities in the Beaufort and Chukchi Seas. In addition, steps have been taken to authorize taking of small numbers of bottlenose dolphins and

other marine mammals incidental to the removal of abandoned offshore platforms in the Gulf of Mexico. Since rulemaking to authorize taking under section 101(a)(5) generally took at least eight months, the Marine Mammal Protection Act was amended in 1994 to streamline the authorization process by eliminating the rulemaking requirement and altering provisions for public comment on letters of authorization. No requests for authorization under the new provision were submitted in 1994.

Research and Studies Program (Chapter XI)

The Marine Mammal Protection Act directs the Marine Mammal Commission to undertake research and studies it deems necessary or desirable to further the objectives of the Act. In 1994 the Commission supported, among other things, a review of international conservation agreements to identify factors limiting their effectiveness and to recommend approaches to make existing and new agreements more effective; participation, through the Inuit Circumpolar Conference, of representatives of Alaska Native communities in international meetings related to the protection of Arctic flora, fauna, and ecosystems; publication of an updated plan prepared by the IUCN-The World Conservation Union's Species Survival Commission for the conservation of threatened and endangered cetaceans; the acquisition and evaluation of post-World War II Soviet whaling data; development of guidelines to minimize impacts of tourism on the Antarctic environment; analysis of aircraft survey data on a gray whale feeding aggregation in the Russian Chukchi Sea; acquisition and review of historic data on sea otters taken along the west coast of North America by Russians in the 18th and 19th centuries; and assessment of when and where conflicts are likely to occur between fisheries and the expanding sea otter population off Washington. These and other projects are discussed in this chapter, as are the Marine Mammal Commission's review of Federally-funded marine mammal research activities and actions taken to identify and guide development of needed marine mammal research programs.

Permits for Marine Mammal Research, Public Display, and Enhancement (Chapter XII)

As an exception to the Marine Mammal Protection Act's moratorium on taking marine mammals, the Secretaries of the Interior and Commerce, in consultation with the Marine Mammal Commission, are authorized to issue permits to take marine mammals for scientific research, public display, and enhancement of marine mammal populations. In 1994 the Commission reviewed and commented on 40 permit applications and 59 requests for permit modifications.

In 1994 certain problems associated with scientific research permits received considerable attention. Because some permit requirements seemed overly burdensome and some permits seemed to be used for non-scientific purposes, Congress amended the Marine Mammal Protection Act in 1994 to simplify authorizing research with little likelihood of injuring animals and to add a new permit category for commercial and educational photography. In 1994 the Commission worked with involved agencies to implement the new measures and to make other

permit requirements simpler and clearer. The Commission also reviewed and conditionally approved permit applications for studies to assess the effects on marine mammals from the long-term use of powerful underwater sound sources to detect changes in ocean temperatures.

Other issues discussed in this chapter include swim-with-a-dolphin programs, feeding wild marine mammals, and Navy ship-shock testing off California. The Commission provided advice to the National Marine Fisheries Service on each. With respect to the first two issues, final reports on marine mammal impacts and related matters were made available by the Service in 1994 and will be considered in rulemaking actions in 1995. The Commission's comments on the Navy ship-shock testing program, which involves underwater detonation of powerful explosives, were considered by the National Marine Fisheries Service in developing a rule to authorize the small take of marine mammals during the tests. The authorization was challenged successfully in a suit brought against the Navy and the Service. In a court-approved settlement, the Navy agreed to carry out the first of the planned tests further offshore and to prepare an environmental impact statement before doing further testing.

Marine Mammals in Captivity (Chapter XIII)

Before passage of the 1994 amendments, the National Marine Fisheries Service and the Fish and Wildlife Service were responsible for implementing and enforcing regulations on the care and transport of captive marine mammals under the Marine Mammal Protection Act. In 1994 the Act was amended to make it clear that primary responsibility rests with the Department of Agriculture's Animal and Plant Health Inspection Service, under the Animal Welfare Act. The Commission worked with the Animal and Plant Health Inspection Service to help it assess the implications of the shift in authority and effectively meet its new responsibilities. As a related but separate matter, the Service began a negotiated rulemaking process to update the standards, last reviewed in 1984, for the care and maintenance of captive marine mammals. The process will consider, among other things, previous Commission recommendations.

The export of marine mammals to foreign countries has been controversial because standards and care abroad are often lower than in the United States. This may place animals at greater risk. In 1994 the Marine Mammal Protection Act was amended to require that authorization to export live marine mammals be granted only if receiving foreign facilities meet standards comparable to U.S. standards. The Commission advised the Animal and Plant Health Inspection Service on meeting these new provisions and, among other things, recommended that the comparability determination include an inspection of the foreign facility seeking animals.

Appendices

Four appendices appear at the end of the report. Appendix A lists recommendations made by the Commission in 1994. Appendix B lists Commission-sponsored reports published by the National Technical Information Service. Appendix C provides citations for papers and reports resulting from Commission-sponsored work and published elsewhere. Appendix D fully describes the 1994 Amendments to the Marine Mammal Protection Act.

Chapter I

INTRODUCTION

This is the 22nd Annual Report of the Marine Mammal Commission, covering the period 1 January through 31 December 1994. 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 developing, reviewing, and making recommendations on the actions and policies of all Federal agencies with respect to marine mammal protection and conservation and with carrying out a research program.

Personnel

The Commission consists of three part-time Commissioners appointed by the President. The Marine Mammal Protection Act requires that Commissioners be knowledgeable in marine ecology and resource management. During 1994 the Commissioners were John E. Reynolds, III, Ph.D., (Chairman), Eckerd College, St. Petersburg, Florida; Paul K. Dayton, Ph.D., Scripps Institution of Oceanography, La Jolla, California; and Jack W. Lentfer, Homer, Alaska.

The Commission's full-time 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, General Counsel; Gregory K. Silber, Ph.D., Deputy Scientific Program Director; Jan M. Sechrist, Special Assistant to the Executive Director; Anne K. Kiley, Administrative Officer; Alison G. Kirk, Permit Officer; Lisa R. Jackson, Staff Assistant in charge of publications; and Darel E. Jordan and Susan E. Holcombe, Staff Assistants.

The Commission Chairman, with the concurrence of the other Commissioners, appoints persons to the nine-member Committee of Scientific Advisors on Marine Mammals. Committee members are required by statute to be scientists who are knowledgeable in marine ecology and marine mammal affairs. At the end of 1994, its members were Robert L. Brownell, Jr., Ph.D., (Chairman), National Marine Fisheries Service, La Jolla, California; Daryl J. Boness, Ph.D., Smithsonian Institution, Washington, D.C.; Daryl P. Domning, Ph.D., Howard University, Washington, D.C.; Lloyd F. Lowry, Alaska Department of Fish and Game, Fairbanks; Marc Mangel, Ph.D., University of California, Davis; Bruce R. Mate, Ph.D., Oregon State University, Newport; William Medway, D.V.M., Ph.D., University of Pennsylvania, Philadelphia; Tim D. Smith, Ph.D., National Marine Fisheries Service, Woods Hole, Massachusetts; and Jeanette A. Thomas, Ph.D., Western Illinois University, Macomb.

During 1994 William F. Perrin, Ph.D., National Marine Fisheries Service, La Jolla, California, and Thomas J. O'Shea, Ph.D., U.S. Fish and Wildlife Service, Fort Collins, Colorado, completed their terms of service on the Committee.

During most of 1994 Mr. Benjamin P. Nageak, Barrow, Alaska, served as Special Advisor to the Marine Mammal Commission on Native Affairs. He was succeeded by Mr. Caleb Pungowiyi, President of the Inuit Circumpolar Conference and resident of Anchorage and Kotzebue, on 1 November 1994.

Funding

Appropriations to the Marine Mammal Commission's in the past five fiscal years have been: FY 1991, $1,153,000; FY 1992, $1,250,000; FY 1993, $1,260,000; FY 1994, $1,290,000; and FY 1995, $1,384,000.

Chapter II

REAUTHORIZATION OF THE MARINE MAMMAL PROTECTION ACT AND RELATED LEGISLATION

Authorization of appropriations for three Acts of direct or indirect importance to marine mammals were up for renewal during 1994. They are the Marine Mammal Protection Act, the Endangered Species Act, and the Magnuson Fishery Conservation and Management Act. Authorization for the Endangered Species Act expired at the end of fiscal year 1992, and authorization for the other two Acts expired at the end of fiscal year 1993. During 1994 Congress reauthorized the Marine Mammal Protection Act through Fiscal Year 1999. Although bills were introduced to reauthorize the other two Acts, no final action was taken. Efforts undertaken by the Marine Mammal Commission and others to effect amendment and reauthorization of these measures are discussed below.

Marine Mammal Protection Act

The Marine Mammal Protection Act was originally enacted in 1972. Since then, the Act has been reauthorized and amended several times, most recently in 1994. As summarized below, the process leading to the 1994 reauthorization began with the previous reauthorization in 1988, when an interim exemption for commercial fisheries was added to the Act. Ultimately, Public Law 103-238, the Marine Mammal Protection Act Amendments of 1994, was enacted on 30 April 1994. Its provisions are discussed below.

Background

As discussed in previous Annual Reports, the interim exemption was enacted in response to a 1987 court ruling (*Kokechik Fishermen's Association* v. *Secretary of Commerce*), which created uncertainty about the Secretary's ability to issue incidental take permits to commercial fishermen. The 1988 amendments established a limited five-year exemption for most commercial fisheries, allowing them to continue in operation while enabling the National Marine Fisheries Service to collect information necessary for long-term management of marine mammal-fisheries interactions. The 1988 amendments directed the National Marine Fisheries Service, in consultation with the Marine Mammal Commission and others, to recommend to Congress a new regime to govern the take of marine mammals incidental to commercial fishing activities after expiration of the interim exemption on 1 October 1993.

As the first step in developing a new regime to replace the interim exemption, the 1988 amendments directed the Marine Mammal Commission to make available to the Secretary of Commerce and to the public recommended guidelines governing fisheries-related take of marine mammals. The amendments required the guidelines to provide a scientific rationale and basis for determining how many marine mammals may be incidentally taken; be based on sound principles of wildlife management; and be consistent with and in furtherance of the purposes and policies of the Act. The amendments further required that, to the maximum extent practicable, the guidelines base determinations of permissible take levels on (a) the status and trends of the affected marine mammal populations, (b) the abundance and annual net recruitment of those stocks, (c) the levels of confidence in the knowledge of the affected stocks; and (d) the extent to which incidental taking will likely cause or contribute to the decline of stocks or prevent their recovery to optimum sustainable population levels. After considering comments received on draft guidelines, the Commission transmitted its recommended guidelines to the National Marine Fisheries Service on 12 July 1990.

The 1988 amendments directed the Secretary of Commerce, after consultation with the Marine Mammal Commission, regional fishery management councils, and other interested agencies and organizations, to publish for public review and comment a suggested regime to govern incidental taking after 1 October 1993. The amendments mandated that the regime include scientifically sound guidelines for determining permissible levels of incidental taking, a description of the arrangements for consulting with other agencies and interested parties, and a description of the regulations and legislation necessary to implement the suggested regime. After consulting with the Commission and considering public comments on two draft versions of the proposed regime, the National Marine Fisheries Service, on 4 December 1992, transmitted to Congress its "Proposed Regime to Govern Interactions between Marine Mammals and Commercial Fishing Operations." The Commission's guidelines and the Service's proposed regime are summarized in previous Annual Reports.

Dissatisfied with some aspects of the Service's proposal, representatives of environmental groups and the fishing industry entered into negotiations to develop an alternative proposal. The negotiating group recommended an alternative approach that would have provided a general authorization to take marine mammals in the course of commercial fishing operations, subject to the following conditions: (1) taking from stocks determined to be "critical" would be subject to measures adopted in a conservation plan; (2) taking from other stocks would be subject to regulation by the Secretary; (3) fishermen would be required to report all incidental lethal takes; and (4) no intentional killing of marine mammals would be permitted. In addition, the taking of endangered and threatened marine mammals would be authorized under the Endangered Species Act (pursuant to a section 7 consultation), rather than under the Marine Mammal Protection Act, as recommended by the Marine Mammal Commission and the National Marine Fisheries Service.

Several environmental groups that participated in the negotiations, as well as others that did not, declined to support the proposal, believing that it did not sufficiently protect marine mammals. Among the concerns expressed by these groups were the need for a central vessel registry from which incidental take and fishing effort data could be collected, a mandatory observer program, sufficient funding of research into alternative fishing technologies, and a prohibition on the take of endangered species.

On 20 April 1993, the House of Representatives Subcommittee on Environment and Natural Resources held a hearing seeking the views of government agencies, the fishing industry, and environmental groups on the National Marine Fisheries Service's proposed regime. Drawing on testimony presented at that hearing and the elements of the various proposals that had been put forward, members of the House Committee on Merchant Marine and Fisheries introduced H.R. 2760 on 27 July 1993. In an effort to pass legislation before the interim exemption expired on 1 October, the Subcommittee on Environment and Natural Resources held a hearing on 14 August 1993 to solicit the views of interested parties on the bill.

Based on the diversity of views presented at the hearing, it was apparent that consensus on a single legislative proposal would not be easy to achieve. Therefore, to avoid reversion to the pre-1988 requirements pertaining to incidental take, and the likelihood that some fishermen would be unable to obtain authorization to take marine mammals under those provisions, Congress passed H.R. 3049, a bill to extend the interim exemption until 1 April 1994. That bill was enacted as Public Law 103-86 on 30 September 1993.

The Senate Committee on Commerce, Science, and Transportation also held hearings on the reauthorization of the Marine Mammal Protection Act during the summer of 1993. A 14 July 1993 hearing addressed the new regime to govern the take of marine mammals incidental to commercial fisheries. A second hearing, held on 28 July 1993, focussed on issues involving public display and scientific research permits.

A bill to reauthorize and amend the Marine Mammal Protection Act, S.1636, was introduced in the Senate on 8 November 1993. The bill would have reauthorized the Act for five years and established an incidental take regime that closely followed the proposal put forward by the negotiating group of fisheries and environmental representatives.

The Commission, in separate letters of 9 December 1993, provided comments on H.R. 2760 and S. 1636 to the appropriate congressional committees. The Commission identified two major problems with the bills. First, both bills would have instituted a fundamental shift in the burden of proof applicable to taking marine mammals. Rather than requiring those seeking authority to take marine mammals to demonstrate that their actions would not adversely affect marine mammal stocks, taking by fishermen would have been allowed unless and until the National Marine Fisheries Service could demonstrate that the taking was adversely affecting the stocks. The Commission noted that this shift in the burden of proof would reverse one of the basic concepts built into the Act when it was passed in 1972 and would run counter to the charge given the Commission by Congress in 1988 that the new regime "be based on sound principles of wildlife management."

The Commission's second concern with the introduced legislation was the requirement that an incidental taking plan be developed and an incidental taking team be established for each critical stock. The Commission noted that such plans would, to a certain extent, duplicate efforts to develop and implement conservation and recovery plans. Furthermore, in those instances when a critical stock is not depleted, threatened, or endangered, and only an incidental taking plan need be prepared, it would be appropriate to address a range of conservation issues broader than fishery-related mortality in the plan. In the Commission's view, divorcing conservation/recovery planning from incidental take planning was illogical and would result in duplication of effort.

Throughout the first part of 1994 Congressional staff continued to work with government agencies and other interested parties to reach a consensus on the new incidental take regime for fisheries. Concurrently, amendments addressing other concerns were being considered. The House Subcommittee on Environment and Natural Resources held an additional hearing on 10 February 1994 to review the provisions of the Act that govern public display, scientific research, and subsistence use of marine mammals. The hearing focused on identifying ways to streamline the permitting process and improve cooperation between Federal agencies and Alaska Natives regarding marine mammal management.

The Senate Committee on Commerce, Science, and Transportation reported S. 1636 with amendments on 25 January 1994. The House Merchant Marine and Fisheries Committee marked up H.R. 2760 on 16 March 1994 and reported the bill on 21 March. The House and Senate each passed its respective bill on 21 March. After working with the Senate to resolve differences between the two bills, the House of Representatives, on 22 March, amended and passed S. 1636. Two days later the Senate passed S. 1636 as it had been amended by the House, but with two additional amendments. The amendments would have required a study of the effect of a new provision to allow imports of polar bear trophies from Canada and would have deleted the addition of "harm" to the Act's definition of "take" passed by the House. Because of timber industry concerns that inclusion of the term "harm" in the Marine Mammal Protection Act definition would influence the consideration of habitat protection measures under the Endangered Species Act or prejudice pending litigation on whether "harm" under the Endangered Species Act includes adverse modification of habitat, the legislators found themselves at an impasse.

With the 1 April 1994 expiration of the interim exemption extension only days away, H.R. 4412 was introduced to extend the interim exemption until 1 May 1994. The bill was quickly approved by Congress and was signed into law (Public Law 103-228) on 31 March.

House sponsors of H.R. 4412 made it clear that no further extensions of the interim exemption would be entertained. This pronouncement placed renewed pressure on Congress to resolve the differences in the House and Senate-passed versions of S. 1636. Ultimately, reference to harm was dropped from the bill and S. 1636 was passed by both chambers on 26 April 1994. The bill was signed into law as Public Law 103-238 on 30 April 1994.

Summary of Amendments

As discussed above, Public Law 103-238, the Marine Mammal Protection Act Amendments of 1994,

was enacted on 30 April 1994. The amendments reauthorized appropriations for the Marine Mammal Commission, the Department of Commerce, and the Department of the Interior, the agencies responsible for implementing the Marine Mammal Protection Act, and made substantial changes to many of the Act's provisions. The most significant amendments involved adoption of a new regime to govern the take of marine mammals incidental to commercial fishing operations to replace the interim exemption which has been in place since 1988. Major changes were also made to the Act's permit provisions. A summary of the amendments is provided below. A more detailed discussion is provided in Appendix D.

Three new sections were added to the Act to address interactions between commercial fisheries and marine mammals. New section 117 requires the preparation of marine mammal stock assessments that will constitute the scientific basis for the new regime to govern the taking of marine mammals incidental to commercial fisheries. Each assessment, among other things, is to include a calculation of the stock's potential biological removal level, a conservative estimate of the number of animals that could be removed from the stock without causing it to decline below, or preventing it from increasing to, its optimum sustainable population level. The assessments are also to include information on the sources and levels of human-caused mortality and serious injuries. If (1) the level of mortality and serious injury exceeds the potential biological removal level, (2) the stock is listed as endangered or threatened under the Endangered Species Act, or is declining and likely to be listed in the foreseeable future, or (3) the stock is designated as depleted under the Marine Mammal Protection Act, the stock will be classified as a strategic stock.

New section 118 sets forth the requirements of the new incidental take regime. The new regime is to replace the interim exemption when implementing regulations are published by the National Marine Fisheries Service or on 1 September 1995, whichever occurs earlier.

The new regime, in certain respects, is patterned on the interim exemption. Classification of fisheries, and registration and monitoring requirements based on those classifications, are maintained. The basis for classifying fisheries has been changed, however, from the frequency of all incidental takes (including disturbances and temporary capture) to the frequency of incidental mortalities and serious injuries.

The new regime differs most significantly from the interim exemption by focusing agency resources on the most pressing marine mammal-fishery interaction problems - those involving strategic stocks. A take reduction plan is to be developed for each strategic stock that interacts with a fishery that frequently or occasionally kills or seriously injures marine mammals. The goal of these plans is to reduce, within six months of implementation, incidental mortality or serious injury to levels less than the calculated potential biological removal level. Priority is to be given to plans for stocks for which incidental mortality and serious injury exceeds the potential biological removal level, those that have a small population size, and those which are declining most rapidly.

The new regime retains the Act's goal of reducing incidental mortality and serious injury of marine mammals to insignificant levels approaching a zero rate, but establishes a seven-year time frame by which this is to be accomplished. The new regime also includes a mechanism for authorizing a limited incidental take of marine mammals listed as endangered or threatened, something the interim exemption did not allow.

Actions taken with respect to the preparation of stock assessments and implementation of the new incidental take regime are discussed in Chapter V.

New section 120 addresses interactions between pinnipeds and fishery resources. Under this provision, States may apply to the National Marine Fisheries Service to obtain authorization for the intentional lethal taking of pinnipeds in certain instances. Such authorization may not be granted if the pinniped stock is listed as threatened or endangered under the Endangered Species Act, is designated as depleted under the Marine Mammal Protection Act, or is determined to be a strategic stock.

Section 120 also directs the National Marine Fisheries Service to investigate the impacts of growing

sea lion and harbor seal populations on the recovery of salmonid stocks and on the coastal ecosystems of Washington, Oregon, and California. The Service is also to establish a Pinniped-Fishery Interaction Task Force to examine problems involving pinnipeds in the Gulf of Maine that may be interacting in a dangerous or damaging manner with aquaculture resources.

The establishment of a Pinniped-Fishery Interaction Task Force to consider the lethal removal of sea lions at the Ballard Locks and actions taken regarding interactions between pinnipeds and aquaculture operations in the Gulf of Maine are discussed in Chapter V.

Significant amendments to the Act's permit provisions were also enacted. The amendments simplified the procedures for authorizing transfers of marine mammals among display facilities and greatly limited oversight for the care and maintenance of captive marine mammals under the Act. While the authority of the Animal and Plant Health Inspection Service to regulate such matters under the Animal Welfare Act was not affected, it is expected that the amendments will result in that agency assuming greater responsibility over certain aspects of captive care.

In response to concerns from the Commission and others that the process for issuing scientific research permits was unnecessarily complex and cumbersome, Congress incorporated a general authorization for certain types of research that have the potential to disturb, but not to injure, marine mammals. Also greater flexibility was added to the permitting process by allowing the 30-day public review and comment period to be waived when delay could result in injury to a species, stock, or individual marine mammal, or in the loss of unique research opportunities.

The amendments also added a new permit category allowing the Secretary to issue permits for educational or commercial photography. Applicants for such permits must demonstrate that any taking will be limited to Level B harassment (actions that have the potential merely to disturb marine mammals, as differentiated from Level A harassment, which has the potential to injure animals) and must indicate the manner in which the films, photographs, or videotapes will be made available to the public.

These and other amendments affecting permits are discussed further in Chapter XII.

In addition, the amendments added a new permitting authority under which polar bear trophies may be imported from Canada. Before permits may be issued, the Fish and Wildlife Service, in consultation with the Marine Mammal Commission, must determine that Canada has a monitored and enforced sport hunting program consistent with the purposes of the Agreement on the Conservation of Polar Bears and that Canada's program is based on scientifically sound quotas that ensure the maintenance of the affected population stock at a sustainable level. Implementation of this provision is discussed in the polar bear section in Chapter IV.

Section 110 of the Act was amended to require the Secretary of Commerce to convene a regional workshop to assess human-caused factors affecting the health and stability of the Gulf of Maine marine ecosystem and to recommend a research and management program designed to restore or maintain the ecosystem. This section was also amended to require the Secretary of Commerce to undertake a research program to monitor the health and stability of the Bering Sea marine ecosystem and to resolve uncertainties concerning the causes of observed declines in populations of marine mammals, sea birds, and other living resources. Actions concerning the studies of the Gulf of Maine and Bering Sea ecosystems are described in Chapter V.

In response to concerns that the Agreement on the Conservation of Polar Bears may not have been fully implemented by the United States and other parties, Congress amended section 113 of the Act to require the Secretary of the Interior to initiate two reviews. First, the Secretary is to initiate an intergovernmental review of the effectiveness of the Polar Bear Agreement. Second, the Secretary is to review domestic implementation of the Agreement, particularly with respect to the habitat protection mandates of the Agreement. Actions with respect to the Agreement on the Conservation of Polar Bears and implementation of the amendments concerning the Agreement are discussed in Chapter VI.

Section 119 was added to the Act to encourage greater cooperation between the Federal agencies responsible for marine mammals and Alaska Natives. Among other things this section authorizes funding for the development of co-management programs. A discussion of this and other amendments is provided in Appendix D.

Endangered Species Act

The Endangered Species Act was last reauthorized in 1988 for a five-year period. While Congressional reauthorization of the Act was expected in 1992 and again in 1993 and 1994, no bill was passed. At the heart of the reauthorization debate is the interplay between the protection afforded listed species and economic interests. During 1993 and 1994, Members of the 103rd Congress proposed amendments to the Endangered Species Act and introduced wide-ranging legislation to give greater recognition to individual property rights, to prevent the Federal government from placing unfunded mandates on state and local governments, and to require that additional cost-benefit analyses of regulatory actions be undertaken.

During the 1993 session of Congress, ten bills to amend and/or reauthorize the Endangered Species Act were introduced. Of these, the two key bills were H.R. 1490, introduced by Representative W.J. (Billy) Tauzin on 25 March, and H.R. 2043, introduced on 6 May by Representative Gerry E. Studds.

H.R. 1490 would have made several fundamental changes to the Act. The recovery planning process would have been changed to require the Secretary to appoint economists and land-use specialists, as well as biologists, to recovery teams and to require those teams to assess the socioeconomic impacts expected to result from listing and conserving a species, including effects on employment and on the use and value of property. When designating critical habitat, the Secretary would have been required to consider the cumulative economic impact of the designation and of the underlying decision to list the species. In addition, the bill would have made mandatory the Secretary's discretionary authority to exclude areas from critical habitat designations based on economic considerations. The bill also would have established a binding arbitration process to enable private property owners to seek compensation if they believe that actions taken under the Act have substantially deprived them of "the economically viable use" of their property.

Changes also would have been made to the Act's section 7 consultation process. Currently, section 7 requires Federal agencies to ensure that their actions, and actions they fund or authorize, are not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. Under the proposed amendment, actions that would destroy or adversely modify critical habitat would be prohibited only if they also jeopardized the continued existence of the species. Reasonable and prudent alternatives suggested by the Fish and Wildlife Service or the National Marine Fisheries Service to avoid jeopardy would have to be designed to impose the least socioeconomic costs.

A consultation procedure also would have been established for private individuals. If an individual obtained a "no jeopardy" biological opinion for a proposed activity and complied with terms and conditions specified by the Service to minimize the impact of the action on listed species, any incidental taking of such species would not constitute a violation of the Endangered Species Act or the Marine Mammal Protection Act. This new process would likely have replaced the existing section 10 provision for authorizing incidental takes for non-Federal activities, which, among other things, requires an applicant to prepare a conservation plan, and would supersede the small-take provision of the Marine Mammal Protection Act for endangered and threatened species, thereby replacing the negligible impact standard with a no-jeopardy standard.

Under H.R. 1490 existing recovery plans issued by the Fish and Wildlife Service would have remained in place. However, the National Marine Fisheries Service would have been required to reissue recovery plans for species under its jurisdiction in accordance with new requirements set forth in the bill. The new requirements would have applied to recovery plans developed for Hawaiian monk seals, Steller sea lions, right whales, and humpback whales.

Other provisions of H.R. 1490 would have redefined the term "take" to exclude harassment or habitat destruction unless injury to an endangered animal species resulted; allowed any person to request an independent review of proposed species listings or critical habitat designations; authorized lawsuits to challenge agency determinations that listing petitions present substantial evidence that listing may be warranted; required that data relied upon for listing decisions be "verified by field testing"; and reauthorized the Act for a five-year period.

The Studds bill, H.R. 2043, would have reauthorized the Endangered Species Act for six years at funding levels considerably above those that would have been set under H.R. 1490. The bill would have moved away from the Act's current single-species approach by directing the responsible agencies to give priority to species listings that would reduce the need to list other species dependent on the same ecosystem and to the preparation of recovery plans that would benefit groups of listed and candidate species dependent on a common ecosystem. Like H.R. 1490, H.R. 2043 would have established an outside review process for listing proposals, but such review would be limited to instances in which there is a substantial scientific basis for questioning the Service's determination. It would also have directed the Service, concurrent with a species listing, to establish a procedure whereby a person could receive the agency's assessment as to whether a particular activity would constitute a prohibited taking.

Other key features of H.R. 2043 were provisions to increase the cooperation between Federal and state agencies with respect to listing actions and conservation efforts and to provide incentives to private landowners to conserve listed species. In this regard, the bill would have authorized appropriation of $25 million per year to assist private landowners in carrying out species conservation activities. The bill would also have established a policy making the conservation of listed and candidate species an affirmative obligation of all Federal departments and agencies and would have authorized and provided funding for the development of habitat conservation plans for candidate species.

S. 921, a companion bill to H.R. 2043 introduced by Senator Max S. Baucus, would also have clarified that the consultation requirements of section 7 apply to all Federal activities, including those taken abroad or having extraterritorial effects. S. 1521, a companion bill to H.R. 1490, was introduced in the Senate by Senator Richard C. Shelby.

During the 1994 session of Congress six additional bills to amend the Endangered Species Act were introduced. One bill would have, among other things, required the Secretary of the Interior to pay private and public land owners just compensation if the designation of a species as endangered or threatened, the designation of critical habitat, or the implementation of a recovery plan foreclosed an otherwise lawful use of the property. Another bill would have amended the Act to require the Secretary to prepare economic impact analyses concerning various actions taken to protect listed species. Three other bills would have imposed a moratorium on new listings of species as endangered or threatened until the Endangered Species Act is reauthorized. One of these would also have established a similar moratorium on new critical habitat designations. The remaining bill would have amended the Act to authorize the Secretary to provide assistance to state and local governments to support habitat acquisition pursuant to conservation plans.

Although the Senate and House both held hearings on Endangered Species Act reauthorization during the 103rd Congress, none of the 16 introduced bills were reported out of Committee.

It is expected that the 104th Congress will turn its attention to the Endangered Species Act early in its first session. Representative Don Young, the new chairman of the House Committee on Natural Resources, has established a task force to review the Act's provisions and draft proposed amendments.

Magnuson Fishery Conservation and Management Act

The Magnuson Fishery Conservation and Management Act was last reauthorized in 1990 for a four-year period. That authorization expired at the end of fiscal

year 1993. During the 1993 session of Congress, a single reauthorization bill (H.R. 780) was introduced. It would have reauthorized the Act through fiscal year 1997 without amendment. During the 1994 session, seven other reauthorization bills were introduced. Each of these would also have amended various provisions of the Act.

Among those bills were H.R. 4430 and S. 2138, which were introduced at the request of the Administration. The essentially identical bills would have required the regional fishery management councils to address instances of overfishing within a set time period, added new national standards to require the rebuilding of depleted stocks and to minimize wasteful bycatch, imposed user fees on commercial fishermen, required members of the regional fishery management councils to recuse themselves from voting on any issue in which they have a financial interest, provided protection for essential fish habitat, and established a national program for managing fisheries data.

On 29 June 1994 the Subcommittee on Fisheries Management of the House Merchant Marine and Fisheries Committee held a hearing on H.R. 4430, focusing on the proposal to impose user fees on commercial fishermen. Administration witnesses explained that the National Performance Review had concluded that private parties should compensate the nation for their use of public resources and noted that marine fisheries were the only public resource for which such fees are not assessed. The Administration's user fee proposal, however, was overwhelmingly rejected by both the House and Senate oversight committees.

The Senate Committee on Commerce, Science, and Transportation held a hearing on S. 2138 in New Bedford, Massachusetts, on 30 July. That hearing focused on the effects of the proposed amendments on New England fisheries.

The House Fisheries Management Subcommittee marked up the original reauthorization bill, H.R. 780, on August 10. The bill was amended to include provisions addressing, among other things, habitat protection, overfishing, bycatch, council member conflicts of interest, and treaty tribe representation on councils.

On 7 October 1994 Senator John Kerry and Senator Ted Stevens introduced S. 2538, the Sustainable Fisheries Act. That bill included new mechanisms to address overfishing and rebuild depleted fisheries stocks, improve habitat protection, provisions mandating bycatch and waste reduction, streamlined procedures for approving fishery management plans and associated regulations, revisions to fishery management council procedures and conflict of interest rules, authority to charge fees associated with the issuance of individual transferrable quotas, fisheries disaster relief, vessel or permit buy-outs for overcapitalized fisheries, provisions for vessel refinancing, and revised management of highly migratory species.

None of the reauthorization bills passed during the 1994 session of Congress. At the end of 1994 Senator Stevens and Representative Don Young were readying bills for introduction early in 1995.

Chapter III

PRINCIPLES FOR WILDLIFE CONSERVATION

The Marine Mammal Protection Act calls upon the Marine Mammal Commission to "recommend to the Secretary of State appropriate policies regarding existing international arrangements for the protection and conservation of marine mammals, and suggest appropriate international arrangements for the protection and conservation of marine mammals." To these ends, the Commission meets its immediate obligations by participating in and making recommendations on negotiations in process, and its long-term responsibilities by examining basic principles and policies affecting the conservation of wild living resources, particularly marine mammals. In furtherance of the latter objective, in 1994 the Commission undertook the work described below.

Workshop on Principles for the Conservation of Wild Living Resources

In 1974 and 1975 the Council on Environmental Quality, the World Wildlife Fund-U.S., the Ecological Society of America, the Smithsonian Institution, and the International Union for the Conservation of Nature and Natural Resources (now known as IUCN-The World Conservation Union) cooperatively sponsored a series of workshops to review basic principles for conserving wild living resources. The workshops concluded that traditional single-species, maximum sustainable yield management principles were outdated and recommended adoption of new principles for the conservation of wild living resources. The results of the workshops were published in 1978 in *New Principles for the Conservation of Wild Living Resources* by Sidney J. Holt and Lee M. Talbot.

By 1992 the principles had not been fully integrated into either domestic or international fisheries and wildlife conservation programs. Recognizing this, and the fact that there had been great scientific and technological advances since 1975, the Marine Mammal Commission concluded that a comprehensive update of the "New Principles" paper was indicated. The Commission therefore contracted for a global overview of wildlife conservation to be carried out in 1992 and 1993, and in 1994 held an international workshop of more than 40 experts to update the principles set forth in 1978 in light of the consultations held, papers prepared for the workshop by participants, workshop discussions, and other relevant factors.

Summary of Consultations

With respect to the worldwide consultations carried out in 1992 and 1993 with key research and management professionals, the purposes were:

(1) to review what has happened since the mid-1970s to the stocks of living resources themselves, changes in management theory and practice, and improvements in scientific knowledge and technology;
(2) to determine whether the principles described in 1978 should be augmented or modified; and
(3) to identify obstacles to the adoption of the "new principles" and what needs to be done to make the principles operational.

Consultations were carried out in Africa, Asia, Australasia, Europe, North America, the Pacific, and the Caribbean. More than 380 individuals were consulted from these and other areas, including Central and South America. The Commission believes that those consulted are broadly representative of the individuals who study, manage, or are otherwise directly involved with the conservation of wild living resources throughout the world. While the

people consulted are from 33 nations (including ten from the Americas, seven from Asia and Australia, four from Africa, and twelve from Europe), their field experience is truly global. About 53 percent of those consulted were involved with science through scientific research or other academic endeavors, and about 47 percent were involved with management, administration, or decision-making in connection with wild living resources. Approximately 54 percent specialized in marine resources and 46 percent in terrestrial and freshwater resources.

Those consulted believed that, among the dramatic changes in the understanding of and approach to conservation of living resources in the past 20 years, was a shift from believing that it is possible to manage living resource exploitation on a sustainable basis to seriously questioning whether it is possible to achieve sustainable exploitation of most living resources. They cited two major reasons for the changed perspective.

The first is that ecosystems generally are perceived differently than they were in 1975. They noted that the dominant view then was that ecosystems were stable, closed, internally regulated, and behaved in a deterministic manner. The new paradigm is of more open systems in constant flux, usually without long-term stability, and affected by a series of human and other often stochastic factors, many originating outside of the ecosystem itself. As a result, resource conservation and ecosystem change are recognized as probabilistic and multi-causal rather than deterministic and homeostatic; they are characterized by uncertainty rather than certainty.

The second factor noted by those consulted is the fundamental role of social and economic forces in determining management goals and management actions. Socioeconomic factors normally determine whether or not a management regime will be implemented, regardless of how sound it is scientifically. Two practical implications of the new perspective are that (1) management must recognize ecological uncertainty as one of the overriding factors determining whether or not it is possible to achieve the consumptive or non-consumptive objectives of management, and (2) any approach to management that does not take socioeconomic factors into account probably will not succeed.

There was strong agreement on the need to redefine the basic principles for the conservation of living resources and, more important, to implement those principles without delay. There was also agreement that, while the same basic principles apply in general to all living resources — aquatic or terrestrial, animal or plant — there may be significant differences in how the principles must be implemented for different types of resources in different areas.

Those consulted believed that virtually all species and stocks of wild living resources that are being harvested commercially have been or are being depleted. While habitat change is often a contributing factor, the harvest itself is regarded as the primary cause of depletion. Where there is depletion of species and stocks that are not commercially harvested, the main factor appears to be habitat change, ranging from destruction or degradation of habitat, competition for food (often with humans), or mortality incidental to other exploitative activities.

The principles published in 1978 were considered by those consulted as basically valid, the main criticism being that they have not been implemented. There was also agreement that the principles should be augmented by explanations of how they can be implemented.

The main obstacles to implementation identified were related to motivation. In large part, the motivating forces are economic, with the objective of resource users being to obtain maximum, immediate economic gain. The issue is aggravated by the differences between the timeframe within which politicians and business people work and the length of time required for resources to recover from overexploitation. The second major obstacle to implementation is the lack of political will to make ecologically sound decisions. The third major obstacle involves policy, law, and institutional arrangements — in short, the ways which those responsible for resource conservation make policy and implement decisions.

The importance of scientific knowledge as the foundation for effective management was recognized,

as was the fact that the need for more and better scientific information is almost universal. Those consulted noted, however, that there is usually enough information, when viewed within the context of uncertainty and risk assessment, to guide conservation action without delay. Postponement of management decisions until adverse effects have been documented irrefutably leads almost inevitably to management failure.

The application of ecosystem approaches to resource conservation was much discussed. While some believed that present knowledge and capabilities are not equal to the task and that discussion of ecosystem management simply diverts energy from the urgent business of managing species, there was broad agreement that an ecosystem perspective is essential to focus thinking and serve as a guiding principle.

Growth of the human population was nearly always mentioned as a major obstacle to effective long-term conservation of living resources. The resource needs of a growing population exert constantly mounting pressure, and the resulting physical changes to the earth, along with associated factors such as pollution, ozone depletion, and climate change, lead to ecosystem changes that may not be reversible. Most felt that scant attention will be paid to living resource conservation in situations where the priorities of peoples and their governments must be on increasing food production and further economic and social development.

The 1994 Workshop

With benefit of the 1978 paper by Holt and Talbot, the informal discussion papers prepared by participants and circulated before the Commission's workshop, and the preliminary reports on the global consultations noted above, 42 international experts met in March 1994 to review and refine principles for the conservation of wild living resources and determine what might be done to better implement them.

Workshop participants emphasized that many wild living resources (fish, wildlife, forests, grasslands, *etc.*) have been lost or severely depleted by unregulated or poorly regulated exploitation and that the welfare of the planet demands development of more effective means for conserving such resources. They endorsed the four basic principles proposed by Holt and Talbot (1978) for the conservation of wild living resources. They also noted that the principles have not been either adopted widely or effectively implemented largely because (1) the assumption was made that, given sufficient information, scientists could accurately predict sustainable yield levels and the effects of resource exploitation on other components of the ecosystems of which the resources are a part; (2) the principles failed to take into account the socio-economic consequences of both resource use and regulation of resource use and to involve "stakeholders" in the decision-making process; and (3) neither the principles nor the accompanying text described mechanisms for implementing the principles. In their deliberations, workshop participants also took into account the significant conceptual and technological advances that have occurred since the 1970s.

Among the many points noted during the meeting were:

- resource conservation demands a transparent decision-making process such that decision-makers can be evaluated on the process, on the data and assumptions used, and on the outcome;
- effective conservation may require taking actions that are sub-optimal in the short term, in order to generate information to improve long-term conservation;
- the concept of a "right to use the resource" must be replaced by the concept of "privilege to use the resource," and users must pay for the right of access to public resources in order to assure funding for needed research and management programs;
- the basic presumption governing resource use should be that resource use will damage the resource and the ecosystem of which it is a part, rather than the reverse, which is now the norm;
- human population growth and demands for resources are components of almost every conservation problem and must be recognized as such;
- the scientific, social, and economic components of conservation must be recognized in decision-making, as must the fact that the relative mix varies from issue to issue;

- understanding the organizational behavior of regulatory institutions is a key to improving the effectiveness of conservation policy;
- although scientific input is essential to address most conservation problems, scientists should not be used to set the goals of the community and scientific consensus should not be forced;
- policy-makers should neither ask scientists for firm conclusions when such do not exist nor interpret scientific results to suit preferred policy outcomes;
- uncertainty demands a conservative approach;
- immediate, simple solutions generally do not exist for conservation problems;
- dispute settlement procedures must avoid the dangers of management based on averaging the positions of all stakeholders;
- those involved in conservation need to learn the concepts and language of economics and sociology, and *vice versa*, in order to communicate more effectively and successfully;
- open and clear communication based on mutual respect can greatly aid conservation efforts;
- although ecosystem management may not be practicable now, resource use must be managed from an ecosystem perspective that compels one to take into account the interconnectedness of effects; and
- because economic systems can respond much faster than ecological systems and because modern communications allow economic decisions to be made rapidly and far from where the resources occur, ways must be devised to prevent the extremely rapid economic time-scale from overtaking the biological one.

The draft of the report now under review sets forth seven general principles proposed by workshop participants to guide conservation of wild living resources. They are:

(1) maintenance of healthy populations of wild living resources in perpetuity is inconsistent with growing human consumption of and demand for those resources;
(2) the goal of conservation should be to maintain present and future options by maintaining biological diversity at genetic, species, population, and ecosystem levels, and as a general rule, neither the resource nor other components of the ecosystem of which it is a part should be perturbed beyond natural boundaries of variation;
(3) assessment of the possible ecological and socioeconomic effects of resource use should precede both proposed use and proposed restriction of ongoing use of a resource;
(4) regulation of living resource uses must be based on an understanding of the structure and dynamics of the ecological system of which the resource is a part and take into account the economic and sociological influences affecting resource use, directly and indirectly;
(5) the full range of knowledge and skills from the natural and social sciences must be brought to bear on conservation problems;
(6) effective conservation requires understanding and taking account of the motives, interests, and values of all users and stakeholders, but not by simply averaging their positions; and
(7) effective conservation requires communication that is interactive, reciprocal, and continuous.

The report of the meeting, expected to be published in 1995, will include detailed discussions of means to implement each of the principles.

Analysis of Fishery Conservation Agreements

Most international regimes governing the conservation and management of living marine resources were negotiated and concluded several decades ago when commercial landings of fish and shellfish were steadily rising. Since the late 1980s, however, total commercial landings have generally declined, and the landings of many species of great economic value such as Atlantic bluefin tuna and Atlantic cod have declined dramatically. Other changes have occurred as well. Government subsidies and the discovery of unexploited populations of fish have fed an extraordinary growth in the world's fishing fleet, and advancements in technology have made possible and profitable fishing in areas and for fish stocks that previously were inaccessible. Whether through incidental taking or through alteration of marine ecosystems, fishing activities have also affected the conservation of marine mammals around the world.

Concerned that conflicts between commercial fishing and marine mammals will increase as competition for declining fishery resources intensifies, the Marine Mammal Commission initiated a study in 1994 of selected international regimes for the conservation of living marine resources to which the United States is a party. The study has been undertaken to achieve three objectives: to identify deficiencies and causes of deficiencies in international fisheries and conservation regimes to which the United States is a party; to identify provisions that should and should not be included in international fisheries regimes if they are to be effective; and to identify the types of decision-making and scientific advisory bodies best suited to effectively guide implementation of ecologically sound fisheries management regimes.

The report will be published in 1995. The review draft now being circulated sets forth 18 principles, including several that focus on important considerations for decision-making: sustainability and abundance, ecosystem perspective, integrative perspective, adaptive management, conservative management, anticipatory management, and accountability. The draft also notes that successful implementation of conservation regimes requires the involvement of harvesting nations, non-governmental organizations, intergovernmental organizations, and objective scientific bodies.

Finally, the draft proposes procedures and mechanisms for fostering sound conservation, including adequate financing mechanisms, integrated monitoring, accurate and timely reporting by harvesters and processors, independent data collection, full economic accounting, impact assessment, and compliance monitoring and enforcement.

The draft assesses the degree to which these elements are reflected in the text and operation of 15 international conservation regimes, including the Convention for the Establishment of an Inter-American Tropical Tuna Commission, the International Convention for the Regulation of Whaling, and the Convention on the Conservation of Antarctic Marine Living Resources.

The Commission believes that this analysis, which is being widely reviewed by persons in government, commercial fisheries, academia, and the environmental community, should contribute to the negotiation of ecologically stronger agreements from which everyone will benefit.

Chapter IV

SPECIES OF SPECIAL CONCERN

Section 202 of the Marine Mammal Protection Act directs the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, to make recommendations to the Department of Commerce, the Department of the Interior, and other agencies on actions needed to protect marine mammals. To help meet this charge, each year the Commission devotes special attention to particularly vulnerable species or populations. Such species may include marine mammals listed as endangered or threatened under the Endangered Species Act or depleted under the Marine Mammal Protection Act (Table 1), as well as others.

During 1994 special attention was directed to a number of endangered, threatened, or depleted species or populations found in the United States and elsewhere. These included West Indian manatees, dugongs, sea otters, Steller sea lions, northern fur seals, northern right whales, humpback whales, bowhead whales, and vaquitas. Other species and populations not so listed but which nonetheless received special attention in 1994 included harbor seals, Pacific walruses, killer whales, gray whales, harbor porpoises, and polar bears.

West Indian Manatee (*Trichechus manatus*)

West Indian manatees occur in coastal waters of the Atlantic Ocean, the Gulf of Mexico, and the Caribbean Sea from the southeastern United States to northeastern Brazil. They also occur around the Greater Antilles and Trinidad and Tobago. There are two recognized subspecies: the Florida manatee, *T. manatus latirostris*, found only in the southeastern United States, and the Antillean manatee, *T. manatus manatus*, found throughout the remainder of the species' range. The species is listed as endangered under the Endangered Species Act, as vulnerable in the Red Data Book, published by IUCN-The World Conservation Union, and on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

The largest known group of animals anywhere in the species' range is in the southeastern United States. Based on aerial surveys of its winter range in January 1992, Florida manatees number at least 1,856 animals. They appear to be divided into two nearly separate groups of roughly equal size — one along the Gulf of Mexico coast of Florida and the other along the Atlantic coast of Florida.

During cold weather manatees aggregate in Florida and southern Georgia at natural warm-water springs, heated outfalls from power plants and other industrial facilities, and in the year-round warm waters at the extreme southern tip of the Florida. In spring they begin to disperse and by late summer they occur throughout Florida and coastal areas north to South Carolina. On rare occasions, individuals may wander as far north as Maryland to the Chesapeake Bay and as far west as Texas, although animals sighted in Texas may be migrants from Mexico rather than Florida. Historical records indicate Florida manatees are as geographically widespread today as in the past.

The Florida manatee is one of the most endangered marine mammals in the United States. The most immediate and apparent threat is the high level of known manatee mortality, a third or more of which is human-related (see Table 2). Manatee deaths in the southeastern United States increased steadily from the late 1970s to 1990, when a record high of 214 carcasses were documented. Although some 45 animals killed by an unusually severe cold spell were recovered in January 1990, the total mortality in 1990 would have been close to the previous record level of 176 deaths in 1989 even without those deaths.

Table 1. Marine mammal species and populations listed as endangered (E) or threatened (T) under the Endangered Species Act and depleted (D) under the Marine Mammal Protection Act, as of 31 December 1994[1]

Common Name	Scientific Name	Status	Range
Manatees and Dugongs			
West Indian manatee	*Trichechus manatus*	E/D	The Atlantic coast and rivers of North, Central, and South America from southeast United States to Brazil; Puerto Rico and other Greater Antilles Islands
Amazonian manatee	*Trichechus inunguis*	E/D	Amazon River basin of South America
West African manatee	*Trichechus senegalensis*	T/D	West African coast and rivers; Senegal to Angola
Dugong	*Dugong dugon*	E/D	Northern Indian Ocean from Madagascar to Indonesia; Philippines; Australia; southern China; Palau
Otters			
Marine otter	*Lutra felina*	E/D	Western South America; Peru to southern Chile
Southern sea otter	*Enhydra lutris nereis*	T/D	Central California coast
Seals and Sea Lions			
Hawaiian monk seal	*Monachus schauinslandi*	E/D	Hawaiian Archipelago
Caribbean monk seal	*Monachus tropicalis*	E/D	Caribbean Sea and Bahamas (probably extinct)
Mediterranean monk seal	*Monachus monachus*	E/D	Mediterranean Sea; Atlantic coast of northwest Africa
Guadalupe fur seal	*Arctocephalus townsendi*	T/D	Baja California, Mexico, to southern California
Northern fur seal	*Callorhinus ursinus*	D	North Pacific Rim from California to Japan
Steller sea lion	*Eumetopias jubatus*	T/D	North Pacific Rim from California to Japan
Saimaa seal	*Phoca hispida saimensis*	E/D	Lake Saimaa, Finland
Whales, Porpoises, and Dolphins			
Baiji	*Lipotes vexillifer*	E/D	Changjiang (Yangtze) River, China
Indus river dolphin	*Platanista minor*	E/D	Indus River and tributaries, Pakistan
Vaquita	*Phocoena sinus*	E/D	Northern Gulf of California, Mexico
Northeastern offshore spotted dolphin	*Stenella attenuata*	D	Eastern tropical Pacific Ocean
Eastern spinner dolphin	*Stenella longirostris orientalis*	D	Eastern tropical Pacific Ocean
Mid-Atlantic coastal bottlenose dolphin	*Tursiops truncatus*	D	Atlantic coastal waters from New York to Florida
Northern right whale	*Eubalaena glacialis*	E/D	North Atlantic, North Pacific Oceans; Bering Sea
Southern right whale	*Eubalaena australis*	E/D	All oceans in the Southern Hemisphere
Bowhead whale	*Balaena mysticetus*	E/D	Arctic Ocean and adjacent seas
Humpback whale	*Megaptera novaeangliae*	E/D	Oceanic, all oceans
Blue whale	*Balaenoptera musculus*	E/D	Oceanic, all oceans
Western North Pacific gray whale	*Eschrichtius robustus*	E/D	Okhotsk Sea to South China Sea
Finback or fin whale	*Balaenoptera physalus*	E/D	Oceanic, all oceans
Sei whale	*Balaenoptera borealis*	E/D	Oceanic, all oceans
Sperm whale	*Physeter catodon*	E/D	Oceanic, all oceans

1 From Fish and Wildlife Service Regulations at 50 C.F.R. §17.11 and National Marine Fisheries Service Regulations at §216.15.

Table 2. Known manatee mortality in the southeastern United States (excluding Puerto Rico) reported through the manatee salvage and necropsy program, 1978-1994

Year	Vessel-Related Deaths No. (%)	Flood Gate and Lock Deaths No. (%)	Other Human-Related Deaths† No. (%)	Perinatal Deaths No. (%)	Other Deaths‡ No. (%)	Total Deaths in S.E. U.S.
			1 (1)			
1978	21 (25)	9 (11)	9 (12)	10 (12)	43 (51)	84
1979	24 (31)	8 (10)	2 (3)	9 (12)	28 (36)	78
1980	16 (25)	8 (12)	4 (3)	13 (20)	26 (40)	65
1981	24 (21)	2 (2)	2 (2)	13 (11)	74 (63)	117
1982	20 (17)	3 (3)	5 (6)	14 (12)	78 (67)	117
1983	15 (19)	7 (9)	1 (1)	18 (22)	36 (44)	81
1984	34 (26)	3 (2)	3 (2)	26 (20)	66 (51)	130
1985	35 (28)	3 (2)	1 (1)	23 (19)	59 (48)	123
1986	33 (26)	3 (2)	4 (3)	27 (22)	61 (49)	125
1987	39 (33)	5 (4)	4 (3)	30 (26)	39 (33)	117
1988	43 (32)	7 (5)	5 (3)	30 (22)	50 (37)	134
1989	51 (29)	3 (2)	4 (2)	39 (22)	78 (44)	176
1990	49 (23)	3 (1)	6 (3)	45 (21)	113 (53)	214
1991	53 (30)	9 (5)	6 (4)	53 (30)	54 (30)	175
1992	38 (23)	5 (3)	7 (5)	48 (29)	70 (42)	167
1993	35 (24)	5 (3)	5 (3)	39 (27)	61 (41)	147
1994*	51 (26)	16(8)		46 (24)	76 (39)	194

† Includes deaths due to entanglement and ingestion of marine debris, drowning in shrimp nets, poaching, vandalism, *etc.*

‡ Includes deaths due to cold stress, other natural causes, and undetermined causes.

* Figures for 1994 are preliminary.

Source: Florida Department of Environmental Protection

Although manatee mortality declined early in the 1990s, in 1994 it again rose to 194 animals, the second highest total recorded to date. The 1994 figure is particularly alarming because it represents a 32 percent increase over 1993. Moreover, unlike the record level reached in 1990, only four stress-related deaths due to cold temperatures were reported in 1994. Contributing to the high mortality were near-record levels of vessel-related deaths and perinatal deaths and a record high number of deaths in flood gates and navigation locks.

Most of the overall trend in manatee mortality has been driven by changes in the numbers of vessel-related and perinatal (*i.e.*, stillborn and newborn calf) deaths. Vessel-related deaths (*i.e.*, from propeller wounds, hull impacts, or crushing under the weight of watercraft hulls) represent the vast majority of human-related manatee mortality. Over the past ten years, 27 percent of all recorded deaths (427 of 1,572 animals) have been attributed to watercraft. From the late 1970s to 1991 annual vessel-related death totals increased steadily, roughly doubling in size (Table 2). This increase paralleled increases in the number of registered boats in Florida, in the power and speed of

new boats, and in the ability of new boats to operate at high speeds in shallow, non-channel areas.

In 1992 and 1993 vessel-related deaths declined significantly. The reasons are uncertain, but may have been due to extensive new vessel speed rules being implemented for Florida waterways, a decrease in boating activity due to economic forces, or some combination of these and other factors. In 1994, however, the number of vessel-related deaths (51 deaths including two deaths outside of Florida) matched the second highest yearly total. The reason for the sudden increase is also uncertain.

Perinatal deaths, the other major factor driving the overall manatee mortality trend, have followed a pattern nearly identical to that of watercraft-related deaths. Over the past ten years, perinatal deaths have made up 24 percent of recorded manatee mortality (380 of 1,572 animals). The 1994 total of 46 perinatal deaths was the third highest yearly total and included 18 deaths attributed to natural causes and 28 deaths due to undetermined causes.

The causes of perinatal deaths usually are not apparent from recovered carcasses but may involve both natural and human-related factors. Among the possible factors contributing to the increase in perinatal deaths are physiological stress due to the subspecies' location at the northern edge of the species' range, disease, a possible increase in the size of manatee population, disruption of physiological or biochemical processes by pollution, increased stress among pregnant and nursing females due to vessel traffic or other human activity, and an increased proportion of young mothers less able to bear and raise their calves due to high levels of human-caused mortality. To date, little has been done to try to improve understanding of the causes of perinatal mortality and its increasing trend.

High mortality is one immediate concern for the survival of Florida manatees, but probably an even greater long-term threat is degradation and loss of habitat due to coastal development. No other marine mammal lives in such close association with human populations as manatees. And in recent years, Florida's rapidly increasing human population has spurred widespread development that ultimately could leave little room for that association to continue. Much of this development has occurred along coastal waters and rivers important to manatees. Resulting siltation, nutrient enrichment, and other forms of water pollution, as well as removal or filling of wetlands for construction projects, degrade or eliminate natural feeding, resting, mating, nursing, and calving areas. If current rates of increase in human population growth, development, and waterborne activity continue unabated, resulting habitat modification and increased vessel traffic will probably eliminate or nearly eliminate Florida manatees from the wild.

To address these threats the Department of the Interior's Fish and Wildlife Service (and more recently its newly formed National Biological Service) and the Florida Department of Environmental Protection have collaborated to form what has become a model for interagency cooperation in endangered species recovery programs. One of the program's greatest strengths has been the outstanding contributions made by many Federal, State, and local government agencies, industry, public interest organizations, academic groups, and the general public.

Among the many other notable contributors have been the Army Corps of Engineers, the Coast Guard, the U.S. Navy, the National Aeronautics and Space Administration, the Florida Governor and Cabinet, the Florida Game and Freshwater Fish Commission, the Florida Inland Navigation District, the Florida Department of Community Affairs, the South Florida Water Management District, county planning departments throughout Florida, the Georgia Department of Natural Resources, the Save the Manatee Club, the Florida Power & Light Company, Sea World, Inc., the Lowry Park Zoo, the Miami Seaquarium, and the general public, whose voluntary donations to the State and to the Save the Manatee Club make up much of the funding for the manatee program. As discussed in previous annual reports, the Marine Mammal Commission has provided advice and assistance at key points in the development of the manatee program.

Progress to improve the Florida manatee recovery program continued on a number of fronts in 1994. As discussed below, particular efforts were devoted to updating the Florida manatee recovery plan, developing and implementing rules to regulate vessel speeds

in important manatee habitat, developing county manatee protection plans, reducing manatee deaths in flood gates and navigation locks, protecting manatees at the Kings Bay warm-water refuge in Crystal River, and facilitating the release of captive-held and rehabilitated manatees back into the wild.

Updating the Florida Manatee Recovery Plan

Section 4 of the Endangered Species Act requires the Fish and Wildlife Service to prepare recovery plans identifying priority actions needed to restore listed endangered and threatened species or populations under its jurisdiction. In 1980 the Service adopted an initial manatee recovery plan that was the first such plan for any marine mammal. As the plan was implemented, some of its priorities became outdated. Therefore, at the recommendation of the Marine Mammal Commission, the Service updated the Florida Manatee Recovery Plan to reflect new information and planning needs. The revised plan, adopted in 1989, included a five-year planning horizon ending in Fiscal Year 1994. The plan has been used by the Service as well as other agencies and organizations to help coordinate their participation and project their respective budgeting needs for recovery work.

In part because of the anticipated need to update the recovery plan again, the Marine Mammal Commission undertook a comprehensive review of the Florida manatee recovery program during its annual meeting in spring 1992 in Tallahassee, Florida. As one result of its review, the Commission developed a revised step-down outline of recovery tasks to use in updating the 1989 recovery plan revision. The suggested outline was sent to the Service on 16 October 1992 with a request that it be forwarded to the Florida Manatee Recovery Team for review at its 5 November 1992 meeting. The Service did so and, during the meeting, the team agreed that the revised outline was a useful starting point to begin updating the plan. In addition, the team established a drafting committee, chaired by the Marine Mammal Commission's representative on the team, to prepare a recommended revised recovery plan for the Service.

The recovery team completed and transmitted its recommended revised Florida Manatee Recovery Plan to the Service in September 1993. At the end of 1993 it was expected that the Service would revise the plan as necessary and circulate it for public and agency review early in 1994. By fall 1994 a revised draft plan had not yet been distributed. Therefore, the Commission wrote to the Service on 1 September. Noting that many agencies rely on the recovery plan to help plan and justify their manatee-related budget requests and work plans, the Commission recommended that the Service expedite completion and distribution of a draft revised plan for public review and that it adopt a final revised plan by the end of 1994.

The Service replied to the Commission on 21 September 1994, noting that it hoped to complete and circulate a review draft by late fall and to have an approved final revised plan by early in 1995. In late November, the Service circulated a revised draft Florida Manatee Recovery Plan to interested agencies and organizations for review. The draft closely followed the suggested version developed by the recovery team. Like the 1989 revision, it covers a five-year planning period (*i.e.*, Fiscal Years 1995 through 1999). It identifies and describes approximately 120 tasks designed to (1) identify and minimize causes of manatee mortality and injury, (2) protect essential manatee habitat, (3) determine and monitor the status of manatee populations and essential manatee habitat and (4) coordinate and oversee cooperative recovery activities.

At the end of 1994 the Commission was reviewing the draft plan and it understood that a second revised Florida Manatee Recovery Plan, modified to reflect public and agency comments, would be adopted by the Service early in 1995.

Program Funding

Most financial support for carrying out the manatee recovery program has come from the Fish and Wildlife Service and the Florida Department of Environmental Protection (formerly the Florida Department of Natural Resources). With regard to the Fish and Wildlife Service, the Commission wrote to the Service on 2 March 1990 recommending manatee-related research and management priorities and needed levels of support for a five-year period (1991 through 1995). On 17 June 1992 the Commission updated its recommendations based on the above-mentioned 1992

manatee program review and extended the funding projections through Fiscal Year 1997.

The two letters identify the highest priority funding needs for management work carried out by the Service's Endangered Species Field Station and for research carried out by the Sirenia Project. The needs were identified based on both the recovery plan and progress achieved since the first revision was drafted in 1988. For Fiscal Year 1994, the 1992 letter recommended that the Service provide $314,000 to its field station for support of essential management tasks and $693,000 to the Sirenia Project for manatee research. The Service agreed with the recommendations in those letters, and its support for manatee work at the field station and the Sirenia Project has closely approximated levels recommended by the Commission.

In 1993, however, the Department of the Interior established the National Biological Survey (recently renamed the National Biological Service) to unite its research expertise under one organization. As part of the accompanying departmental reorganization, the Fish and Wildlife Service's Sirenia Project was shifted to the new Service. In 1994 a director for the new department was appointed. In light of the transfer of manatee research functions, the Marine Mammal Commission wrote to the National Biological Service's director on 30 November 1994 to ensure that the Service was aware of and would consider the Commission's recommendations regarding funding and personnel needs for the Sirenia Project. At the end of 1994 the Commission had not yet received a reply from the National Biological Service.

Because of the broad scope of work involved in the manatee recovery program, the Fish and Wildlife Service has recognized and encouraged cooperative support from other responsible and affected agencies and organizations. In response, the State of Florida, under the direction of the Governor and Cabinet and the State Legislature, has developed a strong complementary program to meet manatee recovery needs beyond the scope and resources available to the Service. To pay salaries and other operating expenses for its program, the State Legislature authorized a Save the Manatee Trust Fund in 1989. Through this trust fund, approximately $2.5 million has been provided annually in recent years in support of manatee protection work.

While a significant part of the trust fund balance is derived from a portion of State boat registration fees, most of its income (more than 60 percent in the most recent fiscal year) is from voluntary contributions and sources other than mandatory taxes or fees paid by State residents and businesses. That is, most of its funds come from concerned citizens who purchase special manatee automobile licenses, an optional check-off donation boat owners may add to their boat registration fee specifically for the manatee program, other donations, and trust fund interest earnings. In a very real sense, therefore, the State's program is a tribute to the citizens of Florida and a reflection of their concern and support for its activities.

Boating Regulations

Because vessel operators cannot reliably detect and avoid manatees, resource managers have sought to decrease the number of vessel-related manatee deaths by establishing regulations to slow boats down in areas where manatees are most likely to occur. This gives the animals a chance to detect and avoid oncoming boats. Late in 1989 the Florida Governor and Cabinet agreed with this approach and directed that the Florida Department of Natural Resources (now the Florida Department of Environmental Protection) develop county-wide boat speed regulations for 13 key Florida counties. The 13 counties include those where vessel-related manatee deaths and manatee abundance are greatest.

In consultation with local officials and residents, the Department immediately began developing site-specific speed rules on a county-by-county basis. Using information on manatee distribution and movement and local vessel traffic patterns, efforts were made to design rules balancing manatee protection needs with the needs of local boaters and commercial watermen. For navigable waters throughout the counties, rulemakers negotiated a network of measures including channel-exempt, channel-inclusive, and shoreline slow-speed areas, high-speed water sports areas, and no-entry zones.

By the end of 1993 final rules had been adopted for 11 of the 13 counties. In 1994 final rules for the 12th county were adopted and draft rules for the last county had been developed. In addition, work began on drafting manatee-related boat speed rules for three other counties with significant manatee habitat that were not included in the original 13 counties.

While substantial progress in the rulemaking process has been realized, intense controversy over the new measures has impeded their implementation. In several counties, the rules have been challenged under State administrative procedure rules. Although all challenges reviewed to date have been rejected in favor of the State, the actions have delayed posting signs and enforcement efforts and have diverted attention from work on other rules. In other cases, local opposition has prompted the State to amend or substantially revise the rules.

Other factors also have slowed implementation. In some cases, sign posting has lagged a year or more behind rule adoption, preventing enforcement action. Also, until 1993, when the Florida legislature relaxed the penalty for violating manatee speed zones from a second degree misdemeanor to an infraction, enforcement officers were reluctant to issue citations for manatee violations. As a result of these actions, it will probably be several more years before enforcement and compliance records are adequate to assess the effectiveness of the new rules.

County Manatee Protection Plans

When the Florida Governor and Cabinet directed that boat speed regulations be developed for the 13 counties in 1989, they also directed those counties to develop manatee protection plans and they adopted an interim policy for siting boating facilities. The boat speed regulations noted above were to be one element of county manatee protection plans, while other elements were to address the siting of new boating facilities and public awareness provisions. Pending departmental approval of county plans, the interim policy adopted by the Governor and Cabinet called for conditionally limiting the expansion or construction of new boating facilities in the 13 key counties to one power boat slip per 100 feet of shoreline controlled by the developer.

Initially, demands associated with developing the boating regulations precluded attention to other manatee protection plan provisions. However, this has gradually changed. At the end of 1994 one county manatee protection plan had been adopted and plans for the other 12 counties were in varying stages of development. Once a county's manatee protection plan is approved, its provisions relating to boating facilities will supersede the interim policy provisions approved by the Governor and Cabinet.

As a related matter, the Florida Department of Environmental Protection is considering incorporating the provisions it has followed to implement the interim policy on constructing new boating facilities into a formal rule under the Florida Administrative Code. The proposed rule would continue to apply in the 13 key counties only as long as departmentally approved manatee protection plans have not been developed. During 1994 three public workshops were held on the proposed rule. At the end of 1994 a formal proposal had not yet been put forward.

Flood Gates and Navigation Locks

The second highest cause of human-related manatee mortality is the crushing and drowning of animals caught in closing flood gates and navigation locks. As indicated in Table 2, such deaths generally declined from 8 or 9 a year in the late 1970s to about 3 animals a year during the early 1980s. The decline followed a change in gate closing procedures instituted to prevent such deaths. An increase in these deaths in the late 1980s, however, suggested that this mitigation measure was less effective than initially thought. As noted above, flood gate and navigation lock deaths reached a new record level of 16 animals in 1994; this far surpassed the previous record of 9 deaths and confirmed that further mitigation work was an urgent matter. Most of the gates and locks in which manatees have been killed are owned and operated by the South Florida Water Management District or the Army Corps of Engineers.

In response to the increase in manatee deaths in these structures, a task force was established in 1992 to consider potential solutions. The task force included representatives of the South Florida Water Management District, the Corps of Engineers, the Florida

Department of Environmental Protection, Dade County, and the Fish and Wildlife Service. Based on advice of the task force, the Water Management District and the Corps began designing a pressure-sensitive reversing-door mechanism, similar to that used on elevator doors, that could be fitted to existing gates and locks. In 1993 the District tested the device on one of its gates. The results were encouraging although further design work is needed to improve the reliability of the mechanisms. Nevertheless, anticipating that the technical refinements can be developed quickly, the District approved a cost-sharing proposal with the Army Corps of Engineers to retrofit the new mechanisms on problem structures.

In late June 1994 the Commission learned that funding for the proposal was uncertain. On 4 July 1994 it wrote to the Army Corps of Engineers, noting the importance of the proposal and asking for information on its status. On 15 August the Corps replied, sending a detailed summary of the status of efforts to modify the problem structures. The summary noted that the Corps was funding a feasibility study due to be completed in November 1994 on modifying problem structures in central and south Florida; it had received a $3 million appropriation in 1994 to install the new mechanisms; and construction was due to begin in July 1995. It also noted that the South Florida Water Management District had already begun installing the devices on flood control structures under its jurisdiction.

On 1 September 1994 the Commission wrote to the Corps noting that it was pleased and impressed by all that had been done and planned, and that the Corps' efforts would be an outstanding contribution to the manatee recovery program. By the end of 1994 the South Florida Water Management District had completed retrofitting the water control structures with the highest number of manatee deaths, including two structures which together accounted for more than half the flood gate-related fatalities in Dade County. It also had developed an implementation schedule to retrofit some 20 other structures under its control by 1998. Included are all structures under the District's control known to have caused manatee deaths, as well as several structures where fatalities have not been reported but are possible.

Release of Captive Manatees

The Fish and Wildlife Service has authorized five marine parks and institutions in Florida to rehabilitate and maintain injured or distressed manatees. Whenever possible, manatees are to be released back into the wild as soon as possible. In recent years about 15 to 25 rescues have been attempted annually. While many animals are treated and released immediately, others must be brought to one of the five authorized facilities for treatment. In some cases (*e.g.*, severely injured manatees, manatees born in captivity, or manatees held for a long period of time) there has been a reluctance to release animals because of uncertainty about their ability to adapt or readapt to wild conditions. As a result, more than 50 manatees are now held at the five facilities, and space is very limited, as is funding for treating and maintaining additional animals.

To facilitate the release of rehabilitated manatees and to help assess the potential for releasing animals previously judged unreleasable, the Service initiated a "soft release" program in 1994. The program involves transferring captive manatees to an enclosure containing natural vegetation in order to monitor their readaptation or adjustment to natural conditions prior to release. With partial funding from the Florida Department of Environmental Protection and the Save the Manatee Club and permission from the National Aeronautics and Space Administration, the Service constructed a 4.5-acre enclosure in the upper Banana River at the Kennedy Space Center on Florida's east coast in early 1994.

The enclosure was tested early in August when the first manatee, a rehabilitated adult male held for six months, was moved to the new pen. By the end of August, two young orphaned calves from Sea World had also been moved to the enclosure. All animals appeared to do well. They interacted with one another as well as with wild manatees attracted to the pen perimeter after the first animal was introduced. The orphaned manatees also appeared to learn to feed on wild vegetation from the more experienced rehabilitated wild manatee.

After checking the adult manatee's health, he was tagged with a satellite tag and released into the Banana

River on 1 September. He remained in the upper Banana River until the first cold front in mid-December when he moved to a warm-water power plant outfall on the Indian River. The two calves were returned to Sea World in mid-September. They were not released because of the approaching cold season, their inexperience in locating warm-water refuges, and the short amount of time to associate with wild manatees that could lead them to warm-water refuges. The two orphaned calves will probably be among the first animals to be released in 1995. A fourth animal, rescued from the Chesapeake Bay in Maryland early in October and flown back to Florida, also was placed in the enclosure briefly before being released.

Early indications of the enclosure's value are encouraging and bode well for testing increasingly difficult cases. The pen proved safe for manatees, and data on grazing impacts within the enclosure were collected for estimating the facility's carrying capacity. The results indicate that animals not accustomed to feeding on wild food sources will learn to do so from more experienced animals or from wild animals attracted to waters around the enclosure. If further tests confirm the pen's value, another facility likely will be built to help release animals on Florida's west coast.

The Crystal River National Wildlife Refuge

The largest natural warm-water refuge for manatees in Florida is Kings Bay, a lake-like body of water at the head of Crystal River on Florida's west coast. About a mile long and one-half to one mile wide, the bay is fed by hundreds of small warm-water springs and one main spring. The temperature of the springs remains at a constant 74 degrees year-round. The manatees using the bay in winter form one of the few groups in Florida that has clearly increased in number. The peak winter count of about 100 individuals in 1980 is now nearly 300 animals although at least part of that increase is due to the immigration of animals from other areas.

In 1980 the Fish and Wildlife Service adopted regulations establishing three small sanctuaries to protect manatees using the bay in winter. Together, the three areas cover about 11 acres near the main spring and a smaller secondary spring. Each is marked off by buoys and ropes. Within their boundaries, all waterborne activity, including diving, swimming, and boating, is prohibited during the winter manatee season (15 November to 31 March) to provide a retreat from disturbing human activities. To halt plans to develop the small islands in Kings Bay for residential purposes, The Nature Conservancy purchased the islands in 1982 and then sold them to the Fish and Wildlife Service in 1983. The Service subsequently added them to its National Wildlife Refuge System as the Crystal River National Wildlife Refuge.

While the number of manatees using Kings Bay has more than doubled since the early 1980s, so too has the number of divers attracted to the bay by a chance to swim with manatees in the wild and to dive in its warm, clear waters. The number of diver trips in the bay each winter may now exceed 80,000. Unfortunately, these increases have caused increasing levels of harassment. Some divers knowingly or unknowingly engage in illegal manatee harassment activities, such as chasing, grabbing, and even riding animals that are found outside the sanctuary areas. Also, because some divers use lights to dive at night, manatees may be disturbed around the clock.

In response to these concerns, the Service promulgated emergency rules for the winters of 1991-1992 to 1993-1994 to expand one existing sanctuary and establish three new sanctuaries covering a total of 28 additional acres. On 13 May 1993 the Service published proposed rules to make the emergency sanctuary areas permanent. By letter of 8 July 1993 the Marine Mammal Commission recommended that the Service adopt the proposed rules. If public education and enforcement efforts to prevent manatee harassment under the new rules prove inadequate, the Commission also recommended consideration of a permit system, similar to that used in wilderness areas, to regulate the number and density of divers in certain portions of the bay.

On 12 May 1994 the Service published final rules adopting the proposed sanctuaries. The new rules bring the total number of manatee sanctuaries in Kings Bay to six, covering a total of 39 acres. In addition, late in 1993 the Service adopted a public use management plan for the Crystal River National Wildlife

Refuge. Among other things, the plan prohibits access to the main spring for purposes of night diving between 7 p.m. and 7 a.m, and requires local dive shops and others leading dive tours into the sanctuary to obtain special-use permits to help ensure consistent visitor education and resource interpretation.

The staff of the Service's Crystal River National Wildlife Refuge also submitted a proposal to the National Fish and Wildlife Foundation late in 1994 for funding to design and construct an educational display on manatees in a newly renovated headquarters building for the nearby Homosassa Springs Wildlife Park. Homosassa Springs is another natural warm-water refuge used by some Crystal River manatees, and many visitors to the Crystal River Refuge also visit the State park. The park features manatees as one of its attractions and maintains several captive animals that may be viewed by visitors. On 20 December 1994, the Commission wrote to the foundation in support of the Service's proposal. A final decision on funding was expected early in 1995.

Manatee-Related Parks, Refuges, and Reserves

One of the most important tasks in the Florida Manatee Recovery Plan to meet long-term protection needs is acquiring essential manatee habitats for inclusion in the existing network of Federal and State protected areas. In this regard, three major land-acquisition programs have made important contributions. At the Federal level, the Land and Water Conservation Fund has provided money to acquire manatee habitat for inclusion in the National Wildlife Refuge System. At the State level, the Conservation and Recreation Land Trust Fund and the Save Our River Program have acquired important manatee habitat for addition to State protected areas, including State parks, State preserves, and State reserves. As noted in previous annual reports, the Marine Mammal Commission has helped identify and encourage cooperative Federal and State land acquisition efforts through reports on manatee habitat protection needs in the Crystal River area and on Florida's east coast (see Appendix B, Marine Mammal Commission 1986 and 1989).

In 1994 the State of Florida made several major acquisitions and also expanded several approved acquisition projects important for manatees. Probably of greatest importance were actions affecting a project first approved in the mid-1980s along the Crystal River and a more recent project added early in the 1990s along Sebastian Creek on Florida's east coast. The former area, as noted above, includes the largest natural warm-water refuge for manatees in Florida. The latter area is a major resting area and freshwater source for manatees migrating along Florida's east coast. For both projects, the State expanded the project boundaries and completed a major acquisition.

For the Crystal River project, two small areas around Kings Bay, totaling about 26 acres, were authorized to be added to the project design. One of the areas includes a warm-water spring used by manatees. The additions increased the total project boundary to 14,758 acres. Most of the undeveloped shoreline along Crystal River is included in the project. Its completion would help protect the manatees' only access corridor to Kings Bay and would connect the warm headwaters with important manatee feeding areas already purchased by the State and the Fish and Wildlife Service along this stretch of coast. In 1994 the State purchased 4,795 acres for $10 million using funds from the Conservation and Recreation Lands Trust Fund, bringing total project acquisitions to date to nearly 7,250 acres.

For the Sebastian Creek acquisition project, an 8,370-acre addition was authorized, bringing its total proposed size to 15,639 acres. In 1994 a 6,894-acre parcel was purchased for $11 million with funds from the Conservation and Recreation Lands Trust Fund and the Save Our Rivers Program.

Dugong
(Dugong dugon)

The dugong is one of four surviving species in the Order Sirenia, the others being three species of manatees. Dugongs occur in shallow tropical and subtropical waters throughout the Indo-Pacific region from East Africa to Vanuatu in the western tropical Pacific Ocean. Human exploitation has led to extirpation of the species in several previously inhabited archipelagoes, including Mascarene, Laccadive,

Maldives, Barren, Narcondam, Cocos (Keeling), and Christmas Islands around the rim of the Indian Ocean and the Lesser Sunda Islands in Indonesia east of Java. The species is listed by IUCN-The World Conservation Union as vulnerable to extinction. As discussed below, with the exception of the population in waters off Palau, the species is listed as endangered under the U.S. Endangered Species Act.

On 2 December 1970 the Fish and Wildlife Service listed the dugong as endangered under the Endangered Species Conservation Act of 1969. At the time, separate lists were maintained for foreign and domestic protected species. The dugong was placed on the list of foreign species, but was not included on the list of domestic species. When the Endangered Species Act of 1973 succeeded the Endangered Species Conservation Act, the lists of foreign and domestic species were merged into a single List of Endangered and Threatened Wildlife. The dugong was included on this list as endangered throughout its range.

In 1988, however, the Fish and Wildlife Service discovered that the inclusion of the dugong population of Palau was made without the required public notice. Under the Endangered Species Act, any state, including the Trust Territory of the Pacific Islands (which then included Palau), must be notified of listing proposals and invited to comment on them. When this procedural oversight was discovered, the Service amended the List of Endangered and Threatened Wildlife to delete the Palauan dugong population. As a result, dugongs in Palau currently are not protected under the Endangered Species Act or the Marine Mammal Protection Act. Palauan law protects the dugong, but enforcement is inadequate due to limited resources and personnel.

On 5 August 1993 the Service published a proposed rule to list the dugong population off Palau as endangered. The proposal noted that the population is declining and currently numbers fewer than 200 animals. The Service identified illegal hunting as the primary threat to the population and noted that hunting pressure, coupled with the species' low reproductive rate, could lead to the extinction of the population by the end of this decade. The proposed rule also cited threats associated with habitat loss.

On 8 September 1993 the Commission wrote to the Fish and Wildlife Service supporting the proposed listing of the dugong population in Palau as endangered. In its letter, the Commission also recommended that the Service promptly develop and implement a recovery plan for the population. To assist in this task, the Commission contracted in 1993 with a dugong specialist to prepare a draft recovery plan for dugongs in Palau. The draft plan has been reviewed by the Commission and is being revised by the contractor. It is expected to be completed early in 1995.

Although the draft plan was intended for use by the Fish and Wildlife Service in developing a recovery plan, on 1 October 1994 Palau became an independent nation, and the Service no longer has authority for management of the dugong population off Palau. Therefore, when work on the draft plan is finished, the Commission will make it available to the Government of Palau to assist in its management of the population.

As of the end of 1994 the Service had not published a final rule to list the dugong population in Palau as endangered.

Hawaiian Monk Seal (*Monachus schauinslandi*)

The Hawaiian monk seal is the most endangered seal in U.S. waters. After the northern right whale, it also is the nation's most endangered marine mammal. The history of the monk seal genus underscores the fact that monk seals are exceedingly vulnerable to human impacts. The genus includes only two other species, one of which, the Caribbean monk seal (*M. tropicalis*), was last sighted in the 1950s and is now believed to be extinct. The third monk seal species, the Mediterranean monk seal (*M. monachus*), may soon follow the path of the Caribbean species. Mediterranean monk seals have declined to a few hundred animals scattered across the Mediterranean Sea; they exist in isolated groups rarely numbering more than a few individuals, and on the northwestern coast of Africa in a few colonies, the largest of which numbers slightly more than 100 animals.

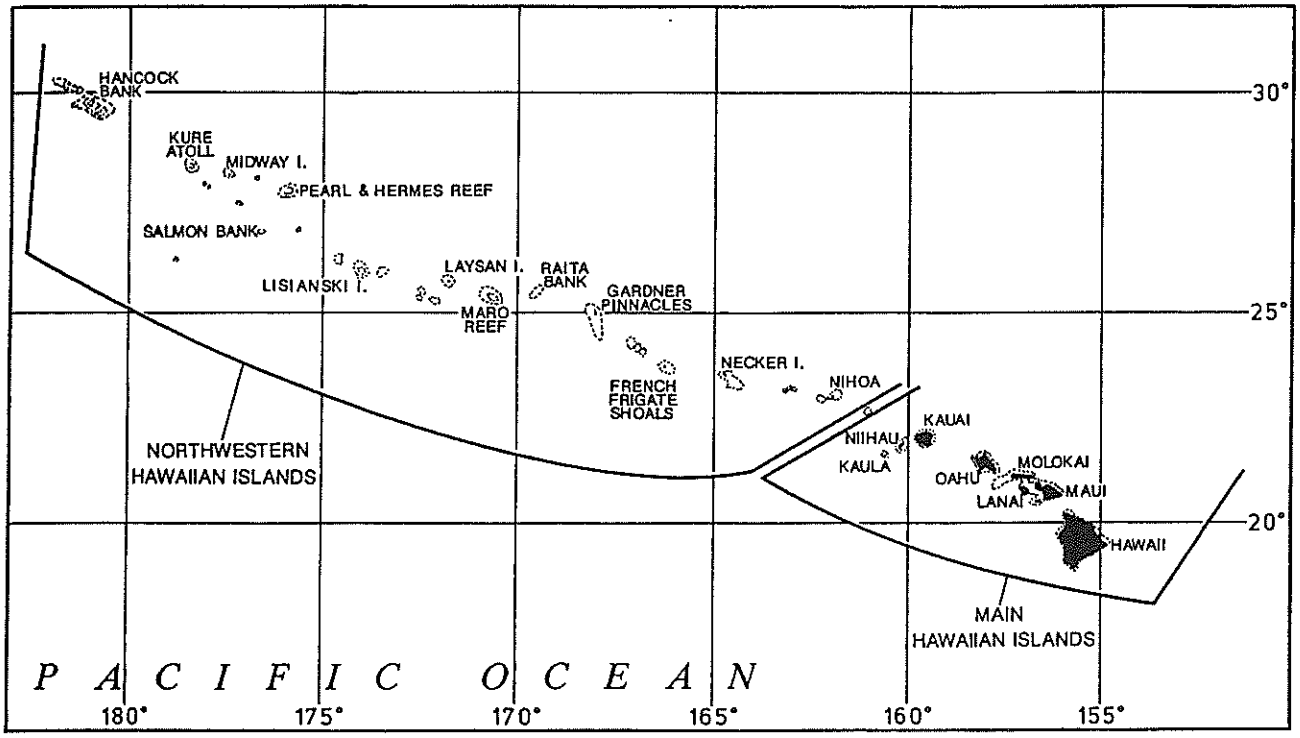

Figure 1. The Hawaiian Archipelago

Hawaiian monk seals occur only in the Hawaiian archipelago where pupping habitat is limited almost exclusively to the chain of small, mostly uninhabited islands and atolls extending some 1,200 miles northwest of the main Hawaiian Islands (Figure 1). Although there is neither archaeological evidence nor Polynesian records to indicate that monk seals occurred historically in the main Hawaiian Islands, their presence there before human occupation seems likely. In recent years, sightings in the main Hawaiian Islands, principally around Kauai, have increased and a few scattered monk seal births have been recorded.

Historical records indicate that Hawaiian monk seals were significantly reduced in numbers late in the 1800s. Initially killed for food by bird hunters and shipwrecked sailors, they were taken later during a short-lived period of commercial sealing. Disturbance of pupping beaches by these transient visitors, as well as by a few permanent residents at some islands early in this century, undoubtedly also contributed to the species' decline and limited its recovery.

More than 90 percent of the Hawaiian monk seal population is now centered at five major breeding islands and atolls: French Frigate Shoals, Laysan Island, Lisianski Island, Pearl and Hermes Reef, and Kure Atoll. A sixth site, the Midway Islands, was a major breeding site as recently as the late 1950s, but is now used by only a few individuals. Although some seals move between atolls, most return to the atolls of their birth to rest, molt, and pup. Consequently, population trends and management needs at each of the major breeding islands are considered relatively discrete.

The total population is now estimated at about 1,200 to 1,400 animals. Based on beach counts at the major pupping sites, monk seal numbers have declined by 20 percent over the past five years and 35 percent since 1985. Most of this decline is due to a sharp

decrease in numbers at French Frigate Shoals, which is the species' largest breeding colony. However, monk seals also have declined at Laysan Island and Lisianski Island, the second and third largest colonies, respectively. Slight increases at the other two major breeding colonies (*i.e.*, Kure Atoll, where intensive population restoration work has been done, and Pearl and Hermes Reef) are far too small to offset the overall decline.

A variety of natural and human threats affects Hawaiian monk seals. Natural threats include shark predation, die-offs due to disease or biotoxins, attacks on female and juvenile seals by groups of aggressive male seals attempting to mate (generally referred to as "mobbing"), and natural environmental changes that affect the availability of prey resources. Human threats include disruption of normal haulout patterns by people and pets on the beaches, interaction with commercial fishermen, overfishing of monk seal prey species, entanglement in lost or discarded fishing gear, entrapment in decaying shore protection structures, and pollution from abandoned equipment or supplies.

In some cases, human and natural threats may combine synergistically. For example, human disturbance of pupping beaches may force pups into the water prematurely where they become easy prey for sharks. Similarly, commercial fishing, which may itself reduce the availability of fish and shellfish eaten by monk seals, may also reduce the capacity of target and non-target stocks to recover from natural ecosystem perturbations, such as climatological changes, and add to the magnitude and duration of prey species depletions. Coastal construction, such as dredging, also may precipitate or intensify blooms of biotoxin-producing phytoplankton whose toxin can kill monk seals.

The National Marine Fisheries Service has lead Federal responsibility for restoring the Hawaiian monk seal population under both the Marine Mammal Protection Act and the Endangered Species Act. The Fish and Wildlife Service also shares important research and management responsibilities because most of the species' pupping and haulout habitat lies within the Hawaiian Islands National Wildlife Refuge, which includes most of the islands and atolls of the Northwestern Hawaiian Islands. Other agencies that have been directly involved in monk seal recovery work include the Coast Guard, the Navy, the Army Corps of Engineers, the Western Pacific Regional Fisheries Management Council, and the Hawaii Division of Aquatic Resources. As noted in previous annual reports, the Marine Mammal Commission was instrumental in initiating the monk seal recovery program and has provided advice and assistance at key points in the program's development.

Marine Mammal Commission Program Review

Over the past three years, a number of important developments have arisen that may significantly affect monk seal recovery plans and priorities. Among other things, the Coast Guard closed a LORAN station it had operated on Kure Atoll since 1960, thereby returning the atoll to an uninhabited state; the Navy initiated steps to close its Naval Air Station on Midway Islands and to relinquish ownership to a new entity; and the Fish and Wildlife Service proceeded with planning to construct a new shore protection system for Tern Island in French Frigate Shoals.

In view of these and other developments, the Marine Mammal Commission initiated a thorough analysis of the Hawaiian monk seal recovery program in the fall of 1994. As part of the analysis, the Hawaiian monk seal recovery program was a major topic at the Commission's annual meeting in Falmouth, Massachusetts, on 16-18 November 1994. To make the best use of the limited time available at the meeting, the Commission wrote to the National Marine Fisheries Service on 20 October 1994 and to the Fish and Wildlife Service on 7 November 1994 asking each to present information on specific issues related to the monk seal recovery activities.

It was apparent to the Commission and the National Marine Fisheries Service that the time available for monk seal discussions at the Commission's annual meeting would not be adequate to fully consider all the relevant data and issues and that a more extensive program review would be needed. By letter of 21 October 1994 the director of the National Marine Fisheries Service's Honolulu Laboratory, where day-to-day operation of the recovery program is conducted, invited the Commission to undertake a more

extensive review of the monk seal program bringing together representatives of involved Federal and State agencies and other outside experts. The Commission fully agreed with the timeliness and importance of such a review and on 26 October accepted the invitation. A preliminary date for the review has been scheduled for spring 1995.

Assessment of Recovery Program Priorities and Needs

Based on information gathered prior to and during the Commission's annual meeting, including the National Marine Fisheries Service's Fiscal Year 1994-1996 Hawaiian monk seal work plan, it was apparent that work during the past 10 years by the Service's monk seal staff had established a firm foundation for the recovery program. However, it also was apparent that work on high-priority tasks had been critically constrained by limited funding and that many important issues were being addressed only partially or not at all. Because a number of actions were obvious and immediately needed, the Commission, in consultation with its Committee of Scientific Advisors, wrote separate letters on 30 November 1994 to the National Marine Fisheries Service, the National Oceanic and Atmospheric Administration, and the Navy. As discussed below, the letters provided views and recommendations on a variety of priority recovery needs.

Restoring Monk Seals to the Midway Islands — The Midway Islands comprise an atoll near the western end of the Northwestern Hawaiian Islands. The two main islands, Sand and Eastern Islands, have been occupied since 1903, first as the site of a trans-Pacific cable relay station and later as a refueling base for trans-Pacific flights. On 4-6 June 1942 the waters around Midway were the site of a crucial World War II naval battle considered to be the turning point for the United States in the Pacific campaign. The islands were briefly occupied by several thousand troops during the war. Since the early 1940s they have been used as a naval air station and at times more than 2,000 people have been stationed there. Recently the number has been about 250. Infrastructure for the station includes a paved runway, a protected harbor, numerous fuel storage tanks, bulkheads, barracks, and other service buildings.

Midway also was the site of a major breeding colony of Hawaiian monk seals. The first beach counts at Midway in 1957 and 1958 averaged about 55 animals. Considering the effects of prior human uses and the large amount of suitable beach habitat for seals, it seems likely that a seal population many times the early counts existed prior to human occupation and should still be supportable. However, when a count was next made in 1968, only a single animal was seen. Since then beach counts have ranged from 0 to about 10 seals with no signs of recovery and most sightings have involved transient animals born or tagged at other islands. Given population declines at other atolls coincident with human occupation, and the available information, the Commission believes there is little doubt that activity associated with use of the islands as a Naval Air Station was the principal reason for the virtual disappearance of seals.

In spring 1992 an unusually large number of underweight seals were found on French Frigate Shoals. The National Marine Fisheries Service sought emergency authorization to rehabilitate and move some of those animals to the Midway Islands in an attempt to restore a breeding colony of seals there. A similar effort had been highly successful in reversing a decline at nearby Kure Atoll during the 1980s. With support from the Commission, the request was granted and by the end of 1992, 15 seals had been released at Midway and nine other seals remained on Oahu undergoing rehabilitation. In January 1993 three more seals were moved to Midway.

Shortly thereafter seven of the 18 seals moved to Midway were found dead and nine other introduced seals had disappeared. Because of limited funding, the Service was unable to maintain people on the islands to monitor animals after they were released and, by the time carcasses could be collected, they were too badly decomposed to determine their cause of death. The pups remaining on Oahu were therefore rehabilitated and released at Kure Atoll, and no further attempts to move seals to Midway have been made. The cause of the seal deaths and disappearances remain uncertain. Two possibilities are toxic effects from eating prey contaminated with ciguatera,

a natural biotoxin, and manmade pollutants. To help assess these possibilities, prey species at the atoll have been collected for ciguatera analyses and tissues from dead seals collected for pollutant studies. Results of the analyses are not yet available.

While the failed reintroduction attempt at Midway was a serious setback for the program, further efforts to rebuild the seal population there seem warranted for a number of reasons: establishing a major breeding colony of seals clearly would be a momentous step towards the species' recovery; there are no other sites within the species' range that could support a major new monk seal colony; past pup rehabilitation and translocation work at Kure Atoll has been highly successful; and, despite uncertainty as to why the first attempt at Midway was unsuccessful, it still seems possible that, with better planning, preparation, support, and follow-up, limiting factors can be identified and overcome.

Long-term prospects for restoring a seal population at Midway also were enhanced in 1993 when the Navy announced plans to close its air station there and to relinquish ownership of the islands and surrounding waters out to three miles. To begin the process of closing and transferring Midway to a new owner, the Navy solicited other Federal agencies, State agencies, and the public for indications of interest in owning or using the atoll. The Fish and Wildlife Service, the only Federal agency to request ownership, proposed adding Midway to its National Wildlife Refuge System. The Coast Guard expressed an interest in using the airfield and harbor to refuel its planes flying enforcement and search and rescue missions, but noted that it did not have funds to pay for the maintenance and operation of the airfield's infrastructure. Other State and private entities declared an interest in owning or using the atoll as a base for fishermen to tranship their catch, a refueling base for private planes, a tourist resort, an eco-tourism destination, and a national historical park. All agencies and groups with an interest in the atoll were invited to participate on a Midway Reuse Committee.

In the summer of 1994 the Navy advised the Fish and Wildlife Service that it was the leading candidate for ownership of the atoll and that it intended to transfer the atoll to a new owner by June 1997. The Navy also proceeded to explore other possible uses compatible with the Service's objectives in order to help meet the Coast Guard's need for a refueling site and to develop an airfield customer base that would defray maintenance and operational costs neither agency could support.

Concurrent with efforts to determine Midway's future, the Navy began work to clean up contaminants and debris left on the island from years of use. In this regard, it established a Base Realignment and Closure Team, with representatives of the Fish and Wildlife Service, the National Marine Fisheries Service, and other Federal and State agencies, to help plan and guide work to ready Midway for its new owner. In consultation with the team, the Navy contracted for an analysis of contaminants that would need to be cleaned up. Once initial contaminant sampling and analysis are completed early in 1995, specific clean-up projects will be identified and scheduled in consultation with the advisory team. Pending results of the analysis and also in consultation with the team, the Navy began work to address obvious needs. Among the actions undertaken in 1994 were efforts to remove old fuel supplies and underground storage tanks and to clear rubble strewn across a beach once used by monk seals.

In light of these developments, the Commission's 30 November letter to the National Marine Fisheries Service noted that it believed the highest priority for the Hawaiian Monk Seal Recovery Program should continue to be restoring a major breeding colony to the Midway Islands. It also noted that a new effort to move seals to the islands should be undertaken as soon as possible but not before it is clear that ciguatera toxins and pollution are not threats to monk seals and there are assurances that clean-up activities will not disturb seals on the beaches. In this regard, the Commission recommended that the Service (a) expedite completion of the analyses for ciguatera and other toxic pollutants from biological samples collected at Midway and (b) encourage the Navy to assign high priority to completing clean-up activities that would pose a risk of disturbing seals on pupping beaches.

Assuming that the analyses and disruptive beach clean-up work can be done soon, the Commission also recommended that the Service (1) immediately devel-

op plans to carry out the limited translocation of 5 to 10 seals to Midway, (2) establish a field camp on Midway in 1995 to collect tissues from seals now at the atoll for contaminant analyses and to radio-tag and track animals for comparison of behavior patterns with seals introduced at a later date, (3) when the next translocation effort is completed, establish a field station on the islands to tag, track, and monitor all released seals, (4) monitor clean-up activities to ensure that they do not disturb seals, (5) complete a long-term plan and budget in consultation with the Fish and Wildlife Service, the Navy, the State of Hawaii, and others for work on restoring a viable seal colony at Midway, and (6) solicit funding and logistic support from the Navy for future work to implement the long-term restoration plan.

Also on 30 November 1994 the Commission wrote to the Navy noting that the decision to close the Midway air station offered a much-needed opportunity to restore a viable monk seal colony to the site. In addition, noting that past Navy activity was the probable cause of the collapse of the Midway seal colony, the Commission expressed its belief that the Navy had both a legal obligation under the Endangered Species Act and an ethical obligation to help re-establish that colony. The Commission therefore recommended that the Navy (a) consult with the National Marine Fisheries Service to determine the financial and logistic support needed to carry out a Midway Islands monk seal recovery program, and (b) provide such funding and logistic support (other than salaries) to carry out that work at least until the Midway seal colony has been restored to the size observed in the late 1950s.

Regarding clean-up activities, the Commission's letter commended the Navy for its prompt attention to this pressing need. It also asked to be advised as to the actions the Navy would be taking to consult with the Fish and Wildlife Service and the National Marine Fisheries Service once clean-up needs had been identified, what materials would need to be removed or otherwise treated, the schedule for future clean-up activities, and the steps that would be taken to ensure that deteriorating seawalls on the island would not become a threat to seals and other wildlife. Finally, the Commission recommended that the Navy (a) transfer ownership of the Midway Islands to the Fish and Wildlife Service for use as a National Wildlife Refuge and (b) make no commitments to parties other than the Fish and Wildlife Service for the use of the islands or the runway unless the Fish and Wildlife Service and the Marine Mammal Commission have been consulted and confirm that such uses would be compatible with the goals of protecting island wildlife and wildlife habitat.

Maintenance of Monk Seals in Captivity — Maintaining monk seals in captivity has been a fundamental part of the monk seal recovery program since the early 1980s. At that time, the Service began a program at Kure Atoll to reduce high juvenile mortality and increase recruitment of mature females. Under the so-called "headstart" program, female pups born on Kure Atoll were held through their first summer in an enclosure on a beach at the atoll. In 1984 this work was supplemented by a program to rehabilitate underweight pups found on French Frigate Shoals and judged unlikely to survive because of an apparent decline in prey resources surrounding that atoll (see below). The pups were nursed back to health at facilities on Oahu and then transported to Kure for release. These efforts continued through the early 1990s at Kure Atoll and successfully reversed steady declines in the total number of seals and the number of pups born on Kure since the Coast Guard first occupied the atoll in 1960.

The maintenance of monk seals in captivity also has helped resolve key research questions on ways to attach radio tags, the effectiveness of drugs to mitigate mobbing behavior, the identification of prey remains in scat samples, *etc.* Captive facilities also provide important options for treating and maintaining animals with serious injuries (*e.g.*, shark bites or wounds from entangling debris) and for removing animals from the wild for management purposes (*e.g.*, to balance sex ratios and minimize attacks on adult females and juveniles by aggressive adult male seals).

Presently, the Service has only one small facility that is capable of holding up to four animals. Most captive seals are therefore held at two marine parks on Oahu that together can hold up to 17 animals. While the cooperation of the parks has been excellent and will, it is hoped, continue in the future, their capacity is limited and their own operational needs sometimes

constrain decisions to capture and treat animals. Also, the Service's program staff has limited expertise to oversee captive-care projects, treat sick and injured animals, and provide routine care of captive animals. It therefore has had to rely to an inappropriate degree on the advice, assistance, and availability of outside experts. This has hindered work to improve husbandry techniques and diverted the time and attention of program staff to other urgent recovery work more in line with their training.

Therefore, to adequately meet future captive maintenance needs with the flexibility essential for carrying out fundamental recovery tasks, the Commission's 30 November letter to the Service recommended that it explore the possibility of using the Navy's facilities at Kaneohe Bay that until recently were used to maintain marine mammals. If that is not possible, the Commission recommended that the Service provide funds for enlarging its small facility at Kewalo Basin to handle at least 15 animals. In addition, the Commission recommended that the Service hire a full-time veterinarian to oversee the care and maintenance of all captive animals.

Prey Availability at French Frigate Shoals — As noted above, the largest monk seal colony is found at French Frigate Shoals. It accounts for nearly half the species' total population and nearly half the number of pups born annually. Since 1989 beach counts at the atoll have declined by nearly 45 percent due to increased juvenile mortality and starvation of pups. The decline continued in 1994, and it seems likely that pup production will decline significantly in the future because of reduced recruitment of reproductive-age females. Available data suggest that prey species, including lobsters taken by commercial fishermen in surrounding waters, have become a limiting factor for this colony, that the colony has exceeded its carrying capacity, and that the carrying capacity itself may have declined due to natural long-term changes in regional environmental conditions.

Assessments of predator-prey relationships have been limited by a poor understanding of monk seal prey preferences and at-sea foraging patterns. To improve information in this regard at French Frigate Shoals, the Service has been collecting and analyzing scat samples to identify prey species but has not yet completed a report on the results. As recommended by the Marine Mammal Commission, the Service also conducted pilot studies in 1992 and 1993 to test the use of satellite tracking methods for determining habitat-use patterns at sea. Those studies demonstrated that tracking technology can provide needed data on at-sea foraging patterns of adult seals, and that foraging patterns of juvenile seals could be investigated using smaller VHF tags and time-depth recorders. A program to tag and track animals, however, has not been undertaken or planned because money is not available.

To develop a program to assess monk seal diet and foraging patterns, the Commission's 30 November letter to the National Marine Fisheries Service recommended that it (1) plan and implement a five-year telemetry program to tag and track an adequate sample of adult and juvenile animals (up to about 40 seals per year) at French Frigate Shoals beginning in 1995, (2) continue studies to collect and analyze scat samples at the atoll, and (3) complete a summary report on the results of past scat analyses.

Mobbing Behavior — At some locations, aggressive sexual behavior by groups of adult male seals is thought to cause the death or serious injury of a significant number of adult females and juveniles of both sexes. The behavior is most common at Laysan and Lisianski Islands. The adult sex ratios at both sites have been more strongly skewed towards males than at other locations and this is thought to be a contributing factor. At Laysan Island, which has been more thoroughly monitored, the number of deaths and disappearances among seals seen with apparent mobbing wounds (*i.e.*, lacerations and open wounds on the back) has been highly variable. Since 1982 it has ranged from three to five animals in most years to as high as 10 to 11 in other years.

The Service has identified two options for reducing mobbing behavior: (1) treating selected adult male seals with a testosterone-suppressing drug to reduce aggressive behavior, and (2) removing enough males to balance the sex ratio. Under both options, work was to focus on non-dominant adult males identified through on-site behavior studies. The former option was tested on captive animals and showed promise; however, the protocol required administering the drug

on two separate occasions several months apart. Therefore, the Service determined that the latter option was preferable.

After considerable planning and behavioral observation and several delays due to insufficient funding, the Service captured and removed 22 adult male seals from Laysan Island in August 1994. The removals left the adult sex ratio at Laysan Island at about 1:1. All but one animal, which died shortly after capture, were transported, tagged, and released in the main Hawaiian Islands. Satellite tags attached to some animals indicate that, as of the end of 1994, all animals had remained in the main Hawaiian Islands.

The Laysan Island monk seal colony must now be watched to assess the effectiveness of the action and to determine if the translocated seals return. The Commission's 30 November letter to the Service therefore recommended that, over the next five years, the Service maintain a seasonal field camp on Laysan Island to monitor the incidence of mobbing and any return of the removed males. In addition, the Commission recommended that the Service maintain a field camp on Lisianski Island over the next five years to collect behavioral data that will allow the selection of adult males for removal or drug treatment, should such work be deemed appropriate at that location.

Population Monitoring — Information on the population status, trends, and conditions of the five major monk seal breeding colonies and the three smaller colonies at Necker, Nihoa, and Midway Islands provides a fundamental basis for identifying and assessing management needs. For example, population data for Kure Atoll identified the cause of its declining seal abundance as high juvenile mortality and led to the highly successful headstart project that has helped reverse the decline. Site visits to collect basic population data also provide opportunities to perform important routine management actions (*e.g.*, removing entangling debris from beaches, disentangling animals, and inspecting for signs of fishery interactions).

Given the species' alarming decline and ongoing management actions, the Commission's 30 November letter to the Service noted the importance of establishing seasonal field camps at monk seal breeding locations. The letter noted that all major colonies as well as the colony on Midway should be monitored annually, and that the smaller colonies at Necker and Nihoa Islands should be monitored at least once every three years until it is clear that the population is increasing. Therefore, noting that work to carry out the above-mentioned recommendations would require field camps on most but not all major breeding atolls and none of the minor breeding islands, the Commission recommended that the Service provide support over the next five years for field camps on Kure Atoll, Pearl and Hermes Reef, Necker Island, and Nihoa Island.

As a related matter, because of funding restrictions, seasonal field camps established in the past by the Service on various islands have had to rely extensively on part-time volunteer help. Without some financial support, however, competent, trained volunteers often cannot be induced to return after the first year and staff must continually train new individuals. In this regard, the Commission's letter noted that the Service relied to an inappropriate degree on volunteer help and recommended that the Service decrease its dependence on volunteers by providing support for five additional part-time employees.

Shore Protection at Tern Island — During World War II, the Navy expanded Tern Island at French Frigate Shoals from an 11-acre sand island to a 37-acre island with a 3,000-foot runway. Shaped like an aircraft carrier, the island was created by constructing a sheet metal bulkhead around most of the island and back-filling with sand and coral. From 1952 to 1979 the Coast Guard occupied the island and operated a LORAN station. Since then, it has been used by the Fish and Wildlife Service as a field station for the Hawaiian Islands National Wildlife Refuge.

The field station and runway have been vitally important to the monk seal recovery program. Over the past ten years the runway has made it possible to rapidly airlift underweight pups found on French Frigate Shoals to rehabilitation facilities on Oahu. Personnel stationed year-round on the island also were instrumental in detecting the sudden increase in seal injuries by commercial longline fishermen, which precipitated adoption of a no-fishing zone near the Northwestern Hawaiian Islands early in the 1990s. In

addition, the island runway has significantly eased logistic burdens and costs for field work at the atoll. And in the future, the runway could well become an indispensable support link for work to restore the French Frigate Shoals seal colony.

The Tern Island field station, however, is at great risk. The perimeter bulkhead protecting the runway is badly deteriorated and could fail completely if hit by a major storm. Such loss would make permanent occupation of the field station too hazardous to continue. For the monk seal recovery program, it would seriously impede pup rehabilitation work. It would expose debris now buried on the island and open erosion pockets behind the seawall that would pose hazards to seals. It would also have a major impact on important research and management work for other wildlife, particularly green sea turtles.

To address this impending danger, the Fish and Wildlife Service contracted with the Army Corps of Engineers to identify alternative approaches for a new shore protection system at Tern Island. Although the Corps' report was to have been completed in 1991, it was not transmitted to the Service until March 1993. Based on the results, the Service chose a preferred alternative involving the construction of a rock revetment around most of the island and, in December 1994, it again contracted with the Corps, this time to prepare detailed construction drawings and plans for its preferred alternative. These plans are to be completed by the end of 1995. In addition, the Service drafted an environmental assessment for the proposed project. Pending receipt of final design details from the Corps early in 1995, the Service expects to complete its assessment by March 1995.

To help ensure that construction work proceeds expeditiously and that appropriate seal protection measures can be factored into the construction planning process at its outset, the Commission's 30 November letter to the National Marine Fisheries Service recommended that it schedule and carry out consultations pursuant to section 7 of the Endangered Species Act as soon as the detailed project plans are available. The earliest date that construction could actually begin is 1996. Funding for project construction, however, must still be appropriated by Congress to the Fish and Wildlife Service.

Interactions with Commercial Fisheries — Past annual reports describe actions that have been taken by the Service, the Western Pacific Regional Fisheries Management Council, the Commission, and others to prevent the death and injury of monk seals attracted to or caught during commercial fishing operations in the Northwestern Hawaiian Islands. In addition to direct interactions with commercial fishing, monk seals also may be affected indirectly by depletion of prey resources. Although evaluating such effects is difficult because information on the diet and foraging patterns of monk seals is very limited, lobsters are a known component of the diet of monk seals and are also a target of commercial fishing operations in the Northwestern Hawaiian Islands.

As noted above, the monk seal colony at French Frigate Shoals is the species' largest and has declined by about 45 percent over the past five years. The cause of the decline appears to be reduced prey availability, and young seals appear to be most affected. Pups born at this atoll often die of starvation and tend to be smaller at weaning than those born on other atolls. Juveniles also tend to be smaller and their survivorship rates, particularly in the first year of life, have declined sharply over the past five years. Although the relative importance of lobsters in the diet of lactating females and juvenile seals is uncertain, they may be an important prey item, particularly for young animals inexperienced in catching more mobile species.

Commercial fishing for lobster in the Northwestern Hawaiian Islands began in 1977. The take soon exceeded sustainable levels and stocks declined. Since 1983 the number of vessels in the fishery has ranged from 9 to 16 per year. Catch per unit of effort among participating vessels declined steadily from 2.75 lobsters per trap haul in 1983 to 0.56 in 1991.

In 1992 the Service adopted recommendations by the Western Pacific Regional Fisheries Management Council to protect the lobster stocks' spawning biomass. The measures limited fishing to a six-month period, limited the number of participating vessels to 15, and established a fleet harvest quota. However, due to continuing stock declines, the Service, again at the recommendation of the Council, closed the fishery in 1993. It was reopened briefly in a portion of the

Northwestern Hawaiian Islands in the summer of 1994 to help assess whether the stocks had recovered. However, catch per unit of effort remained low and the fishery again was closed. While fishing pressure may be one factor contributing to the decline of lobster stocks, an apparent ten-year cycle in regional oceanographic conditions is also thought to be an important factor that has reduced the productivity of lobster as well as other marine species in the Northwestern Hawaiian Islands.

Given the declining number of monk seals at French Frigate Shoals and the apparent difficulty that seals at that site are having in locating prey, the Commission's 30 November letter to the Service noted that a resumption of lobster fishing at this site may well be inconsistent with monk seal recovery objectives. The Commission therefore recommended that the Service close the waters within 20 nautical miles of French Frigate Shoals to all lobster fishing until better information on monk seal prey preferences and foraging patterns has been gathered and demonstrates that commercial fishing for lobster is not likely to limit growth of the seal colony.

Program Funding and Staffing — As indicated above, support for monk seal recovery program tasks has not been adequate to address fundamental needs. For Fiscal Year 1994, about $490,000 was provided to the program. Based on its analysis of the most essential recovery tasks, the Commission concluded that presently the minimum annual funding level to carry out a program having a reasonable chance of success was twice the amount allocated in 1994. Therefore, for the program to have a reasonable chance of succeeding, the Commission advised that the Service must commit itself to a five-year program of substantially increased support. In this regard, the Commission's 30 November letter to the Service set forth a five-year outline of estimated costs for specific research and management tasks and recommended that the Service seek funding at the indicated levels. For Fiscal Year 1995, the first year of the cost outline, the Commission estimated funding for the most essential recovery work at approximately $1.2 million. The Commission is pleased to note that, at year's end, the Service had directed $989,000 toward support of the Hawaiian monk seal program in Fiscal Year 1995.

In a separate letter to the National Oceanic and Atmospheric Administration, also sent on 30 November 1994, the Commission stressed the importance of including an adequate funding base for the program in the budget of the National Oceanic and Atmospheric Administration/National Marine Fisheries Service.

Interagency Coordination — Many agencies and groups now contribute directly or indirectly to the monk seal recovery program. While the Fish and Wildlife Service may be the National Marine Fisheries Service's most important partner, other agencies such as the Navy, the Coast Guard, the Army Corps of Engineers, the Western Pacific Regional Fisheries Management Council, the Hawaii Division of Aquatic Resources, Sea Life Park, the Waikiki Aquarium, and others also have related interests and responsibilities. Coordination between the National Marine Fisheries Service and these agencies and groups is now done on an *ad hoc* basis through individual consultations under the section 7 of the Endangered Species Act.

Improved communications regarding program activities, accomplishments, and needs could help identify additional ways in which cooperating agencies might contribute to logistical or other program needs. Therefore, to keep cooperating agencies informed of the status of recovery program work and to help identify how agencies might best use their authorities and capabilities to augment monk seal recovery activities, the Commission's 30 November letter to the Service recommended that it establish an interagency monk seal recovery implementation team that would help encourage, direct, and coordinate agency participation in the monk seal recovery program.

Related Actions

For the past several years, the Hawaiian Monk Seal Recovery Team has met each year to review program progress and plans for the coming field season. The team met on 6-7 December 1994 to review 1995 plans. A Commission representative participated in the meeting as an observer and, to share its views and help the team with its deliberations, the Commission also sent copies of its letters to the Service and the Navy to the team prior to its meeting. At the end of 1994, the Commission had not yet received a report of the meeting or the team's recommendations.

Steller Sea Lion (*Eumetopias jubatus*)

Steller sea lions, the largest of the eared seals (family Otariidae), inhabit coastal areas along the rim of the North Pacific Ocean from southern California through the Gulf of Alaska and Aleutian Islands to northern Hokkaido, Japan. Rookeries occur in California, Oregon, Alaska, British Columbia, and Russia. Most of the world's Steller sea lions, however, are located in U.S. waters and about 70 percent of all animals occur in Alaska. The largest sea lion concentrations are in the Aleutian Islands and western Gulf of Alaska. The species' prey includes a wide array of bottom and mid-water fishes and invertebrates, including walleye pollock and other commercially important species.

Although commercial interest in Steller sea lions has never been great, they were harvested in the eastern Aleutian Islands and Gulf of Alaska from the late 1950s to the early 1970s. Between 1963 and 1972, about 45,000 animals, including pups and older animals, were taken from that area. In other areas, bounties were placed on Steller sea lions to reduce their predation on commercial stocks of fish. For example, between 1912 and 1963 thousands of sea lions were shot on rookeries and haulouts in British Columbia. Steller sea lions also are harvested by Alaska Natives for subsistence purposes. In the past, skins were used for boat coverings and clothing, the meat was used as food for humans and animals, and the fat became fuel. Although many of these uses have now been replaced by synthetic material, some animals still are taken principally for food.

Over the past 30 years an alarming decline has occurred in the number of Steller sea lions throughout most of their range (see Table 3). Declines of more than 90 percent have been observed at some major rookeries and haulouts in the western Gulf of Alaska, the eastern Aleutian Islands, and Russia. The causes of the decline are uncertain, but may be due to a combination of factors that vary in different parts of the species' range and at different periods of the decline. Some of the possible contributing factors include reduced availability of prey due to commercial fishing or climatic change, human disturbance of rookeries and haulouts, incidental taking and deliberate shooting by fishermen, and subsistence harvests.

For example, commercial harvests in Alaska that ended in the early 1970s may have had an effect on declines through the mid-1970s. Also, incidental and deliberate killing by commercial fishermen in Alaska probably was a factor throughout the 1970s and much of the 1980s. Estimates of the incidental catch by foreign and joint venture trawl fisheries operating off Alaska from 1966 to 1988 exceed 20,000 sea lions. More recent incidental catch estimates, however, number only a few tens of animals annually. An unknown number of animals also were, and perhaps still are, shot by fishermen to protect gear, prevent predation on catch, or simply eliminate a potential source of competition for commercial fish species.

A reduction in the quantity or availability of Steller sea lion prey species due to commercial fishing or climatic change also is a possible, if not a likely, factor contributing to the decline. Among the sea lion prey species harvested intensively by commercial fishermen are walleye pollock, Atka mackerel, herring, salmon, haddock, yellowfin sole, and rockfish. Depletion of prey species in important sea lion foraging areas could reduce the carrying capacity of the environment to support sea lions.

In this regard, there is evidence that food supplies for sea lions have been reduced. The sizes of Steller sea lions in age classes less than 10 years old collected in the 1980s are significantly smaller in weight, length, and girth than those collected in the 1970s. Also, pup survival after weaning has decreased, perhaps due to prey reductions in feeding areas used by juveniles. Some limited data also suggest a shift in sea lion prey selection. Studies in the Gulf of Alaska from 1975 to 1978 found pollock, squid, octopus, herring, capelin, Pacific cod, and salmon to be primary prey species, but in the mid-1980s, the diet of sea lions sampled in the Kodiak Island area was made up almost entirely of pollock, octopus, and flatfishes.

The infrequent observations of entangled animals suggests marine debris pollution has not been a significant factor and there is no indication of any major redistribution of sea lions that might imply

emigration is a factor. Few studies of contaminant levels have been done so possible effects of chemical pollution are largely unknown.

In light of the species' decline, the National Marine Fisheries Service designated Steller sea lions as threatened under the Endangered Species Act in 1990. Since then, the Service has continued surveys to monitor population trends, established a Steller Sea Lion Recovery Team, adopted a species recovery plan, begun efforts to reconsider the species's status under the Endangered Species Act, designated critical habitat, and taken steps to reduce impacts by commercial fishing. Activities related to these matters are discussed below.

Steller Sea Lion Population Surveys

Since 1989 the National Marine Fisheries Service, in cooperation with scientists in Alaska, California, Washington, and Oregon, has carried out surveys of major Steller sea lion rookeries and haulouts to monitor population trends throughout the species' range in the United States. Surveys again were done in 1994. As discussed below and shown on Table 3, the results indicated that the number of sea lions west of the central Gulf of Alaska, which includes most animals, continued to decline in 1994, while the number in the eastern part of the species' range, from the central Gulf of Alaska to California, continued to remain stable.

The markedly different population trends east and west of Cape Suckling, Alaska, which is located along the Gulf of Alaska coast about 150 kilometers east of Prince William Sound, suggest that Steller sea lions may be divided into two relatively discrete stocks at this point. The existence of separate eastern U.S. and western U.S. stocks also is supported by some initial analyses of genetic material from animals east and west of Cape Suckling completed late in 1993.

For all of Alaska, results from the 1994 survey produced a current state-wide estimate (not including pups) of about 45,000 animals, representing decreases of 30 percent since 1989 and 76 percent since the 1960s. All of this decline has occurred west of Cape Suckling. If only the Gulf of Alaska, Aleutian Islands, and Bering Sea are considered, the western U.S. Steller sea lion population estimate (excluding pups) for 1994 is 33,600, which is a decline of 35 percent since 1989 and 81 percent since the 1960s. Since 1990 abundance estimates for all age classes in these western areas have declined, with both pups and non-pups declining at an average rate of about 8 percent per year.

For areas in California and Oregon the 1994 estimate of juvenile and adult Steller sea lions was 7,200 animals representing a 36 percent increase from the 1989 estimate. At the southern end of the species range in central California, however, numbers have declined, possibly suggesting a shrinking of its range due to climatic or other changes. Recent Steller sea lion population estimates for California, Oregon, British Columbia, and southeast Alaska suggest that the overall number of animals in the eastern portion of the species' range is stable.

Steller Sea Lion Recovery Plan and Recovery Team

To help identify and address conservation needs for Steller sea lions in Alaska, the Marine Mammal Commission prepared a species account with research and management recommendations as part of a series of accounts for ten marine mammal species in Alaska (see Appendix C, Lentfer 1988). In 1988, the Commission provided the accounts to the National Marine Fisheries Service. In doing so, the Commission recommended, among other things, that the Service establish a conservation team for Steller sea lions and that the sea lion species account be used to develop a conservation plan for Steller sea lions as had been mandated by amendments to the Marine Mammal Protection Act late in 1988.

The Service agreed, but because of action to list Steller sea lions as threatened under the Endangered Species Act, it instead constituted a Steller Sea Lion Recovery Team and used the Commission's species account as a basic reference for preparing a Steller Sea Lion Recovery Plan. The team, which first met in April 1990, took the lead in drafting a recovery plan. With some changes the Service adopted the plan in December 1992.

Table 3. Steller sea lion population estimates (not including pups), 1960s to 1994

Area	1960s	1970s	1985	1989	1994	% Difference 1960 to 1994
Russia	41,000-52,300	--	--	10,000	--	--
Aleutian Islands	99,000	90,000	61,000	19,000	14,800	-85%
Bering Sea	9,000	4,000	3,000	900	1,700	-81%
Gulf of Alaska	69,000	55,000	38,000	31,600	17,100	-75%
Southeast Alaska	7,000	8,000	8,000	12,300	11,400	+63%
British Columbia	11,500	6,100	6,100	6,100	--	--
Oregon and California	8,000	5,000	5,200	5,300	11,400	+42%
Eastern Stock (U.S. areas only)	15,000	13,000	13,200	17,600	18,600	+24%
Western Stock (U.S. areas only)	177,000	149,000	102,000	51,000	33,600	-81%

Sources:
Loughlin, T.R., A. S. Perlov, V.A. Vladimirov. 1992. Range-wide estimation of total abundance of Steller sea lions in 1989. Marine Mammal Science 8:220-239.
Merrick, R.L, T.R. Loughlin, and D.G. Calkins. 1987. Decline in abundance of the northern sea lion, *Eumetopias jubatus*, in Alaska 1956-86. Fisheries Bulletin 85:351-365.
National Marine Fisheries Service. Unpublished data.

Among other things, the plan identifies work to monitor the population, identify essential habitats, designate critical habitat, assess and minimize mortality and injury due to commercial fishing, monitor subsistence harvests, and determine diet and foraging patterns. One plan element recommended by the team, but not included in the Service's adopted plan, was criteria for delisting the species and upgrading its status to endangered under the Endangered Species Act. On this matter the Service determined that further analysis and discussion was needed.

In addition to drafting a recommended recovery plan, the recovery team also provided recommendations for designating critical habitat, consulting with the Governments of Canada and Russia to protect sea lion habitat, and supporting priority research. The team's plan and recommendations provided useful guidance and were reflected in research and management actions taken by the Service to promote recovery of Steller sea lions in 1992 and 1993. Following the recovery team's meeting in November 1992, however, the Service's intent to maintain the team became uncertain. By letters of 13 May and 30 September 1993 the team chairman wrote the Service asking that it clarify its intent with regard to the team's future responsibilities.

On 18 October 1993 and again on 1 December 1993 the Marine Mammal Commission also wrote to the Service about the team. In view of new information at the time on the population's continuing decline and pending research and management decisions, the Commission recommended that funds be provided to reconvene the team as soon as possible. On 16 December 1993 the Service replied advising that it

had decided not to reconvene the team but instead to convene a new group to review information on the species' status and whether it should be reclassified under the Endangered Species Act.

The Service's reply focused only on the question of the species' status under the Endangered Species Act and did not reflect the value of the team's advice on the broader spectrum of research and management decisions. In view of this broader role, the Commission wrote back to the Service on 6 January 1994 recommending that it reactivate the recovery team on a permanent basis to advise on steps to reverse the species decline as well as to reclassify it under the Endangered Species Act. On 31 January 1994 the Service replied to the Commission's letter stating that it had decided to maintain the recovery team to provide recommendations on specific management issues.

The Service subsequently asked the team to meet in the fall of 1994 to review the results of the 1994 population survey and to consider the species status under the Endangered Species Act. The recovery team met on 29-30 November 1994 and, after its meeting as discussed below, the team wrote to the Service on 20 December commenting on actions with regard to the species' status under the Endangered Species Act. Its advice on other research and management matters had not yet been distributed by the end of 1994.

As a related matter, anticipating the need to carefully review management actions to protect Steller sea lions and recognizing the large amount of new information that was developed in the early 1990s, the Commission contracted for an update of its Steller sea lion species account. At the end of 1994 the account was expected to be completed in 1995 and to be provided to the Service, the recovery team, and others to help ensure that interested parties have access to a clear, up-to-date summary of relevant information for evaluating future research and management needs.

Endangered Species Act Status Review

Because of declines beginning in the 1970s in the number of Steller sea lions, the Environmental Defense Fund petitioned the National Marine Fisheries Service in November 1989 to list Steller sea lions as endangered under the Endangered Species Act. An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. The Service found that information was sufficient to merit consideration of the action and the Marine Mammal Commission supported the listing. The Service, however, determined that the species should be listed as threatened rather than endangered. A threatened species is one that is likely to become endangered in the foreseeable future. Thus, in April 1990 the Service took emergency action to list the Steller sea lion as threatened throughout its range and in December 1990 made the listing final.

From 1990 through 1992 Steller sea lion numbers in the United States continued to decline and, in early 1993 the Service conducted a population viability analysis to help evaluate the long-term implications of its continuing downward trend. Such analyses consider the statistical likelihood of a population going extinct and, based on population survey data from 1985 to 1992, the analysis indicated a high probability that the Steller sea lion population would go extinct within 60 to 100 years unless the trend were reversed or abated.

Although a population survey was not undertaken in 1993, counts of pups were undertaken at some rookeries. The pup counts indicated that the decline was continuing and, in some key areas the rate of decline had increased. Therefore, on 1 November 1994 the Service published a *Federal Register* notice announcing its intent to conduct a status review of the Steller sea lion population to determine if the threatened listing under the Endangered Species Act should be changed to endangered. In its notice, the Service noted that it planned to consider results of a range-wide survey to be done in 1994.

On 6 January 1994 the Commission responded to the Service's notice. Noting that results of the 1994 range-wide survey would not be available until late 1994 and that it was important to complete the review and take appropriate management actions as soon as possible, the Commission recommended that the Service complete its status review using existing data, and that it reexamine and expand efforts to identify the cause or causes of the decline. In addition the

Commission recommended that the Service develop and circulate, to the Commission and the Steller Sea Lion Recovery Team, draft criteria for judging whether Steller sea lions should be listed as endangered. As noted above, the Commission also wrote to the Service on 18 October and 1 December 1993 recommending that it reactivate the recovery team to address this and other research and management issues. The Commission again recommended the action in its 6 January 1994 letter.

The Service responded to the Commission on 31 January 1994. In its letter the Service noted that population survey results from 1989 to 1992 indicated that the overall rate of decline was slower than between 1985 and 1989. Thus, the Service concluded it was important to defer a review of the population's status pending the 1994 population survey results to see if the decline was leveling off. The Service also noted that it annually reviewed work to determine the cause of the decline to identify other steps that should be taken, that it believed it was too soon to determine if the management actions taken over the past several years were working, and that it would develop reclassification criteria and provide them to the Commission and the recovery team for review.

Having received no draft reclassification criteria by spring, the Commission wrote to the Service on 10 June 1994. In its letter, the Commission recommended that, if had not already done so, it take immediate steps to develop the criteria and provide them to the Commission and others for review.

During the Commission's annual meeting on 16-18 November 1994 representatives of the Service reviewed the results of its 1994 Steller sea lion population survey. As noted above, the results indicated that the rate of the decline in the western portions of its range had not slowed, and that the numbers in the eastern portion of its range were stable. During the meeting, representatives of the Service also noted that decreases in pup counts at some key areas had actually accelerated over the past two years; new population viability analyses considering the 1994 population survey results again concluded a high probability of extinction within 100 years; because some rookeries could disappear within 20 years, actions taken in the next 20 years would be critical; new genetic evidence also indicated that there were two stocks rather than one stock of Steller sea lions; and the Service was proceeding with its status review and expected to make a determination with regard to a proposal for changing the species status by early 1995.

On 30 November 1994 the Commission wrote to the Service noting that it had not yet responded to the Commission's 10 June 1994 letter requesting that draft reclassification criteria be provided to the Commission and others. The Commission also noted that no mention had been made during the its annual as to the criteria to be used to make its reclassification determination. It therefore asked that the Service advise the Commission what had been done to develop objective, measurable criteria for determining whether Steller sea lions should be reclassified as endangered. By the end of 1994 the Service had not responded to the Commission's letter and a decision on how the Service would proceed with regard to a listing proposal for the species had not been announced.

As a related matter noted above, the Steller Sea Lion Recovery Team met on 29-30 November 1994 to consider, among other matters, new information on the status of the species and actions that should be taken with respect to the species' listing status under the Endangered Species Act. On 20 December 1994 the team provided the results of its deliberations on this matter to the Service. In its comments on the species' status, the team concluded that Steller sea lions should be managed as two separate stocks — an eastern stock, including areas from Cape Suckling, Alaska to California, and a western stock from Cape Suckling through the Aleutian Islands into Russia. The team also concluded that the western stock should be listed as endangered and the eastern stock should remain listed as threatened.

Habitat Protection

At the same time that the National Marine Fisheries Service listed Steller sea lions as threatened, it also adopted regulations to protect the species and its habitat. Among other things, it adopted regulations to prohibit (1) discharging firearms within 100 yards of sea lions, (2) the operation of vessels within three nautical miles of 35 major sea lion rookeries in Alaska, and (3) approaching rookeries by land to

closer than one-half mile. The Service also repealed existing regulations allowing commercial fishermen to shoot sea lions to protect their gear and catch, and it reduced allowed incidental take limits from 1,350 to 675 sea lions per year. The Commission supported these measures, but also noted that because the declines may be due to reduced food availability, larger buffer areas or changes in fishing seasons or practices should also be considered.

Pollock is a major prey species for Steller sea lions. Late in 1990 the North Pacific Fisheries Management Council recommended increasing the annual quota of pollock in the Gulf of Alaska from 73,400 to 133,400 metric tons for the 1991 fishing season. The Service subsequently adopted a reduced quota of 103,400 metric tons in light of potential effects on sea lion prey availability. A lawsuit was filed to prevent action to increase the quota because of the importance of pollock as sea lion prey; however, the court upheld the quota. Since 1991 pollock catch quotas have remained stable at about 100,000 mt while pollock biomass levels have declined.

Also in 1991 the Service took steps to increase the size of fishery closures around key sea lion rookeries and to alter fishing harvest limits so as to divert fishing operations away from sea lion foraging areas. Final rules were adopted by the Service and became effective early in 1992. The new rules (1) prohibit trawl fishing within ten nautical miles of major rookeries in the Gulf of Alaska, Aleutian Islands, and Bering Sea areas, (2) prohibit trawling within 20 nautical miles of five rookeries during the winter, and (3) establish measures for time and area fishing restrictions to limit operations in important foraging areas.

Throughout the process of designating Steller sea lions as threatened, adopting measures to protect sea lion rookeries, and preparing a species recovery plan, consideration also was given to designating critical habitat under the Endangered Species Act. Critical habitat is defined in the Act as areas with physical or biological features essential for the conservation of a species and which may require special management considerations. Critical habitat is to be designated at the time a species is listed to help ensure consideration of appropriate management action in key geographic areas. The Service, however, was not able to identify critical habitat at the time of listing and instead noted that it intended to propose critical habitat at the earliest possible date.

The Marine Mammal Commission and the Steller Sea Lion Recovery Team subsequently recommended actions to be taken in this regard, but it was not until April 1993 that the Service proposed areas to be designated. Final rules to designate Steller sea lion critical habitat were published by the Service in the *Federal Register* on 27 August 1993 and became effective on 27 September 1993. The areas designated as critical habitat included beaches and buffer areas around 42 major rookeries and haulouts in Alaska, six major rookeries and haulouts in Oregon and California, and three offshore foraging habitats — one in the Gulf of Alaska and two in the Bering Sea and Aleutian Islands areas. Buffers around the terrestrial habitats extended 20 nautical miles off rookeries and haulouts west of Cape Suckling and 3,000 feet off listed areas east of Cape Suckling. Inland and aerial buffers also were included.

Prior to 1993 most aerial surveys and research on Steller sea lions had been conducted in non-winter periods. In 1993 and 1994, however, the National Marine Fisheries Service and the Alaska Department of Fish and Game conducted aerial surveys of rookeries and haulouts in winter in order to assess possible seasonal differences in sea lion distribution. The results indicate that habitat-use patterns on rookeries and haulouts differ between the breeding and non-breeding seasons. The Service therefore has indicated that in 1995 it intends to review its regulations to protect sea lions in these areas to determine if management provisions in these areas should be changed to better reflect knowledge about seasonal changes in sea lion distribution.

Subsistence Harvests

Information on the subsistence harvest of Steller sea lions prior to the 1990s is very limited. To develop such information, the Steller Sea Lion Recovery Plan includes a task to determine and monitor harvest levels. To address this and a similar need for harbor seals in Alaska, the National Marine Fisheries Service contracted with the Alaska Department of Fish

and Game to assess subsistence use of both species. To carry out the study, Native hunters and households in 65 coastal villages in the ranges of the two species were interviewed in 1992 about their subsistence use of these species. The results have provided the first reliable estimates of the number of Steller sea lions taken by Alaska Natives.

For 1992 the study estimated the total take of Steller sea lions by Alaska Natives, including animals struck and lost, was 548 animals (with a 95 percent confidence interval of 452 to 711 animals). More than three-quarters of the take was in the Pribilof and Aleutian Islands area. As noted above, these are the areas where Steller sea lion declines have been greatest. About 10 percent and six percent were in the Kodiak Island area and southeast Alaska, respectively. For 1993 Alaska's state-wide subsistence harvest estimate was 487 sea lions (with a 95 percent confidence interval of 391 to 630 animals) again with most of the catch in the Pribilof and Aleutian Islands. About 25 to 30 percent of the total estimated take was of animals struck and lost. Animals were taken throughout the year, but the peak harvest period was in the fall.

As noted above, a variety of factors are thought to contribute to the decline of Steller sea lion numbers in Alaska. However, the concentration of subsistence harvest in areas where declines have been greatest is a source of concern, and this has been recognized by the Native community. In response, Native residents in the Pribilof and Aleutian Islands acted in the fall of 1994 to establish a Steller sea lion commission to develop a system of self-regulation. During the Commission's 16-18 November annual meeting, representatives of the Service said that it welcomed the action and noted that steps were being taken to work closely with the new Commission and to explore the development of a co-management arrangement similar to that established or being established between the Native community and government agencies on other marine mammal species in Alaska.

Steller Sea Lion Stock Assessment

As noted in Chapter V, the 1994 amendments to the Marine Mammal Protection Act establish a new regime to govern the taking of marine mammals incidental to commercial fisheries and require that the National Marine Fisheries Service prepare stock assessments for marine mammals, including Steller sea lions, in U.S. waters. Among other things, the assessments are to include a best estimate and minimum estimate of population size and an estimate of maximum annual growth rate. The assessments also are to calculate the potential biological removal level that can be safely taken, to identify human sources of mortality, and to determine if a stock is a strategic stock requiring special management attention.

The Service provided its draft stock assessments, including one on Steller sea lions, to the Commission for review in August 1994. On 1 December 1994 the Commission returned comments to the Service on certain stock assessments, including the one on Steller sea lions.

Based on population surveys through 1993, the draft assessment for Steller sea lions included a best estimate of population size for all U.S. waters of 72,518 animals and a minimum population estimate of 71,547 animals. Noting there were no reliable estimates of maximum productivity rate for the Steller sea lion stock, the draft assessment recommended using a generally accepted default value for all pinnipeds of 12 percent per year. From these estimates, a potential biological removal level of 2,146 animals was calculated. Based on fishery observer data from 1989 to 1993 for the Alaska groundfish trawl fishery, the Prince William Sound driftnet fishery, and the California gillnet fishery, the Service estimated a combined incidental take rate of 44 animals per year and noted that this level satisfied the Marine Mammal Protection Act's goal of reducing incidental takes in fisheries to levels approaching zero. Considering subsistence harvests by Alaska Natives (548 animals in 1992) and shootings by commercial fishermen, the Service also concluded that human-related mortality was less than the potential biological removal level, but that because the species was listed as threatened, it would be classified as a strategic stock.

In its comments on this draft stock assessment the Commission noted that, rather than preparing a single stock assessment for all U.S. waters, available information indicated two assessments should be prepared — one for the Gulf of Alaska and Aleutian Islands

stock shared with Russia, and one for the stock extending from southeast Alaska to California, shared with Canada.

The Commission also noted that the purpose of calculating the potential biological removal level is to determine levels of human-caused mortality that will allow populations to equilibrate to levels at or above their optimum sustainable population level. Because the population is not increasing, the Commission noted that this stock assessment should indicate the possible reasons for the lack of growth, such as (1) the calculated potential biological removal level is wrong, (2) human-caused mortality is much higher than believed, or (3) carrying capacity has been substantially reduced, possibly due to development of the pollock fishery in Alaska. The Commission also suggested that the stock assessment identify uncertainties concerning the cause or causes of the population decline and the measures required to resolve those uncertainties.

Harbor Seal in Alaska
(Phoca vitulina)

Harbor seals inhabit temperate and sub-arctic coastal waters of the North Pacific and North Atlantic Oceans and contiguous seas. In the North Pacific, they occur nearly continuously along the shoreline and nearshore islands from San Ignacio Lagoon, Mexico, north through southeastern Alaska, west into the Bering Sea and the Aleutian, Commander, and Kuril Islands, and south to Hokkaido, Japan. They occur principally within 20 km of shore, and appear to concentrate in estuaries and protected waters, although some occupy fresh water streams and lakes on a seasonal basis (except Lake Iliamna in Alaska, which is occupied year-round).

Harbor seals are not migratory. Tagging studies indicate that at least some animals may move long distances, both along shore and off-shore. They haul out on remote beaches, tidal mud flats, offshore rocks and reefs, glacial and sea ice, and objects such as buoys and log booms to rest, pup, and molt. In Alaska, pupping occurs in May-July and molting in June-October. Harbor seals feed on a diverse array of nearshore sub-littoral and benthic prey, including walleye pollock, herring, octopus, squid, shrimp, Pacific cod, capelin, eulachon, sculpin, and flatfishes. Very little is known about the at-sea distribution, movements, or behavior of harbor seals.

Population Status

In the early 1970s approximately 270,000 harbor seals were estimated to occur in Alaska coastal waters. Substantial declines were detected in the 1980s in south-central Alaska, from Prince William Sound through the Kodiak region, and in the south-eastern Bering Sea. Numbers in southeast Alaska appear to have been relatively stable. Numbers in California, Oregon, Washington, and parts of British Columbia have been increasing. In many areas, not enough is known about historic abundance to know whether numbers have increased, decreased, or remained stable.

Over the years, there have been many counts of harbor seals in different parts of Alaska. The counts were not all done in standard ways, at the same time of day, and at the same time of year. Therefore, it has been difficult to determine whether differences in counts from the same areas reflect changes in population size or changes in when and how the counts were done.

In the early 1980s the Alaska Department of Fish and Game began a program to monitor harbor seal trends by making counts of selected "index" sites in the same way, at the same time of year, over several years. The Marine Mammal Commission provided funding for these standard trend counts in 1988 and 1990. In 1991 the National Marine Fisheries Service began a program to obtain a minimum estimate of harbor seal abundance throughout Alaska in order to calculate the potential biological removal level, as now required by section 117 of the Marine Mammal Protection Act. The survey program was continued in 1994. Also in 1994 the National Marine Fisheries Service conducted a radio-tagging study to estimate the proportion of the harbor seal population not hauled out and therefore not likely to be seen during counts done at different times of the day and different times of the year. These data will be used to develop a

correction factor that can be used to estimate actual population size, using the count data.

Aerial surveys were done in 1991 in eastern Bristol Bay, the north side of the Alaska Peninsula, Prince William Sound, and the Copper River Delta; the combined maximum count for all areas was 17,360 animals. In 1992 further surveys were done in Prince William Sound and the Gulf of Alaska, including the south side of the Alaska Peninsula, Cook Inlet, the Kenai Peninsula, and the Kodiak Archipelago; the combined maximum count was 7,823 seals. Southeast Alaska was surveyed in 1993; the combined maximum count was 22,447 animals. The Aleutian Islands were surveyed in 1994, but the results were not yet available at the end of the year.

In Prince William Sound, harbor seal counts declined by more than 50 percent from 1984 to 1992. On Tugidak Island, which historically had one of the largest concentrations of harbor seals in the world, counts at an index area declined from 6,919 in 1986 to 571 in 1992 (a 92 percent decline). Counts throughout the Kodiak region declined 75 to 90 percent between the mid-1970s and 1992. In the past three years, however, counts done by the Alaska Department of Fish and Game indicate that the number of seals at index sites in the Kodiak region increased from 1,562 in 1992 to 2,427 in 1993 and 3,009 in 1994. Likewise, counts at index sites on Tugidak Island increased from 770 in 1992 to 1,424 in 1993 and 1,604 in 1994. Surveys done in 1993 and 1994 in the Sitka and Ketchikan areas of southeast Alaska suggest that harbor seal abundance there is remaining stable.

The reason for the apparent harbor seal decline in the central Gulf of Alaska and southeastern Bering Sea in the 1980s and early 1990s is not evident. Like the Steller sea lion decline in the same area, it appears most likely to be food-related. It is not known whether the decrease in food availability is due to over-harvesting by commercial fisheries, cyclic variation in primary or secondary productivity, long-term climate change, or some other factor or combination of factors.

Harbor Seal Status Review

A review of then available information concerning the biology, ecology, and status of harbor seals in Alaska was published in 1988 as part of a Commission report describing research and management needs for ten marine mammal species in Alaska (see Appendix B, Lentfer 1988). Because of the population decline noted earlier, the Commission contracted in 1991 for an update of the 1988 species account. The update was completed in 1994 (see Appendix B, Hoover-Miller 1994).

As noted in the Commission's previous annual report, the National Marine Fisheries Service initiated steps in 1992 to develop a conservation plan for the declining harbor seal population(s) in Alaska. Instead of completing and implementing the plan, the Service on 11 April 1994 published a *Federal Register* notice indicating that it was initiating a status review to determine whether the species or any population stock of harbor seals in Alaska should be designated as depleted under the Marine Mammal Protection Act. The notice requested information and comments concerning the status of the harbor seal in Alaska.

In response to the request for information, the Commission on 10 May 1994 sent the Service the final review draft of the updated species account mentioned earlier. By letter of 10 June 1994 the Commission commented on factors that would have to be considered to determine whether the entire species or any population stock of harbor seals in Alaska should be designated as depleted under the Marine Mammal Protection Act. The Commission noted that harbor seal abundance clearly had declined in parts of Alaska where harbor seals previously had been common but that, in other parts of Alaska and elsewhere in the North Pacific, harbor seal numbers appeared to have been stable or increasing. The Commission further noted that too little may be known about stock relationships in these different geographic areas to determine whether the observed declines have caused any population to be reduced below its optimum sustainable level. To resolve this uncertainty, the Commission advised the Service that, if it was not already doing so, it should be working with Alaska Natives and the Alaska Department of Fish and Game to obtain tissue samples from harbor

seals being taken for subsistence and research purposes in different parts of the western and central Gulf of Alaska, and to analyze those samples to determine if there are genetic differences possibly suggesting separate populations.

The Commission noted that, while there may be uncertainty as to whether a depleted designation is merited, there clearly has been a substantial decline in harbor seal abundance in the central and western Gulf of Alaska. In this regard, the Commission pointed out that, if the Service was not already doing so, it should be trying to determine and eliminate or mitigate the cause or causes of the decline. The Commission recommended that, if it had not already done so, the National Marine Fisheries Service (1) appoint an appropriate group of experts to finalize the conservation plan for harbor seals in the central and western Gulf of Alaska; and (2) develop and implement a program in consultation with appropriate representatives of the Alaska Native community and the Alaska Department Fish and Game to obtain and conduct genetic analyses of tissue samples from harbor seals being taken for subsistence and research purposes in different parts of Alaska.

At the end of 1994 the Service had not yet responded to the Commission's recommendation. Also, it had not completed or made known the results of its status review.

Draft Stock Assessments

The 1994 amendments to the Marine Mammal Protection Act, described in Chapter II, established a new regime to govern the taking of marine mammals incidental to commercial fisheries. Among other things, the amendments require that the National Marine Fisheries Service and the Fish and Wildlife Service prepare assessments of the status of all marine mammal stocks occurring in U.S. waters. The assessments are to include estimates of the minimum stock size and number of animals that can be removed without causing the stock to be reduced or maintained for a significant period of time below its maximum net productivity level. The assessments also are to identify the sources and levels of human-related mortality and injury, and indicate whether the level of human-related mortality and injury exceeds the potential biological removal level such that the stocks should be designated as a strategic stock.

On 9 August 1994 the National Marine Fisheries Service published a *Federal Register* notice announcing the availability of draft assessments for stocks under the Service's jurisdiction. The draft stock assessments included assessments for two harbor seal stocks in Alaska: a Gulf of Alaska/Bering Sea stock and a southeast Alaska stock.

The Commission, in consultation with its Committee of Scientific Advisors, provided comments on these draft assessments to the Service by letter of 1 December 1994. In its comments concerning Gulf of Alaska/Bering Sea stock, the Commission noted that information provided in the draft assessment suggested that there may be local populations or sub-populations of harbor seals in this area that could be depleted by incidental catch in fisheries, native subsistence taking, and habitat degradation in local areas. The Commission suggested that available abundance, fisheries take, and native harvest data be assessed on a smaller scale (by area rather than region). The Commission also noted that the draft assessment did not, but should, indicate the possible effects of removing numbers of animals, up to the calculated potential biological removal level, from areas where abundance has been declining. The Commission also suggested that the assessment should indicate what has been and is being done to develop and implement a conservation plan for the stock as previously recommended by the Commission.

With respect to the draft assessment concerning the southeast Alaska stock, the Commission questioned the estimate of minimum stock size. It noted that, if a total of 22,447 harbor seals were actually counted during an aerial survey done in 1993, the actual population size would be greater than the minimum population estimate, possibly by a factor of two or more. The Commission also questioned the justification for classifying this stock as a strategic stock. The Commission recommended that the assessment be revised to provide a more thorough description and evaluation of the available data concerning stock size and the sources and levels of human-related mortality and injury.

Northern Fur Seal (*Callorhinus ursinus*)

Northern fur seals occur seasonally in waters around the North Pacific rim from southern California, north to the Bering and Okhotsk Seas, and south to Honshu Island, Japan (Figure 2). Animals also are found in pelagic waters in the northern North Pacific Ocean between the Aleutian Islands and Hawaii. About three-fourths of the world's fur seals breed in the United States on St. Paul and St. George Islands, the largest of the Pribilof Islands, in the southeastern Bering Sea. The species' other large rookeries are in Russia on Robben Island, the Kuril Islands, and the Commander Islands. Small breeding colonies also occur on San Miguel Island off southern California and on Bogoslof Island in the Aleutian Islands. Female and juvenile animals feed mostly on small fish and squid, but little is known about the diet of adult males.

Northern fur seals have been harvested commercially for pelts since 1786. By the late 1800s excessive pelagic harvests reduced fur seal numbers to levels threatening the population's biological as well as economic viability. As a result, nations interested in harvesting fur seals — Canada, Japan, Russia, and the United States — signed the Fur Seal Treaty of 1911. The Treaty prohibited pelagic harvests and established arrangements to share pelts taken from a managed onshore harvest of sub-adult male seals from U.S. and Russian rookeries. With the elimination of female fur seals from the harvest, the population recovered substantially over the next 30 years.

During World War II, the Treaty lapsed, but in 1957, when population size was thought to be about 2 million animals and near its pre-exploitation level, the Interim Convention for the Conservation of North Pacific Fur Seals was signed by the four signatory nations to the earlier Treaty. In the late 1950s and early 1960s females, as well as juvenile males, were taken in the commercial harvest on the Pribilof Islands. The population, however, began declining under the new harvest regime. Therefore, the taking of females was stopped in 1968 and the harvest was again limited to sub-adult males. The population continued to decline until 1970 for reasons thought to be a residual effect of the female harvest, and then increased slightly in the early 1970s.

Rather than continuing to increase, however, the fur seal population entered a second phase of decline. From about 1974 through the early 1980s the Pribilof Islands population declined at a rate of about four to eight percent per year for reasons that were unknown, but which could no longer be explained by the earlier harvest of females. By 1983 the population numbered an estimated 877,000 animals, less than half its size in the early 1950s.

Throughout this period the Interim Convention was extended under a series of protocols until it too lapsed in 1984. At that time, management authority for fur seals in U.S. waters reverted to domestic law under the Marine Mammal Protection Act and the Fur Seal Act of 1966. Under these laws, all commercial harvesting was prohibited and only a much smaller subsistence harvest of juvenile males by Aleut Natives living on the Pribilof Islands was continued. Given the size of the decline, in 1988 the Marine Mammal Commission recommended and the National Marine Fisheries Service designated the northern fur seal as depleted under the Marine Mammal Protection Act. Since the early 1980s the Pribilof Island population has remained relatively stable and was estimated to number about 1 million fur seals in 1994.

While causes of the population decline after the mid-1970s remain puzzling, research indicates that it was related to an increase in mortality of juvenile seals during their first few years at sea. As discussed in past annual reports, some of the more likely factors thought to have contributed to the second phase of the decline include entanglement in marine debris, incidental take in high seas driftnet fisheries in the North Pacific, long-term environmental changes, and reduced prey availability in the North Pacific and/or Bering Sea. The effect of diseases and parasites on mortality rates is poorly known but also may have been a factor. Factors ruled out as being significant include lingering effects of past commercial harvests, continued subsistence harvest of juvenile males, emigration, and predation. While the population is no longer declining, the factors that caused the decline may be preventing its recovery to former levels.

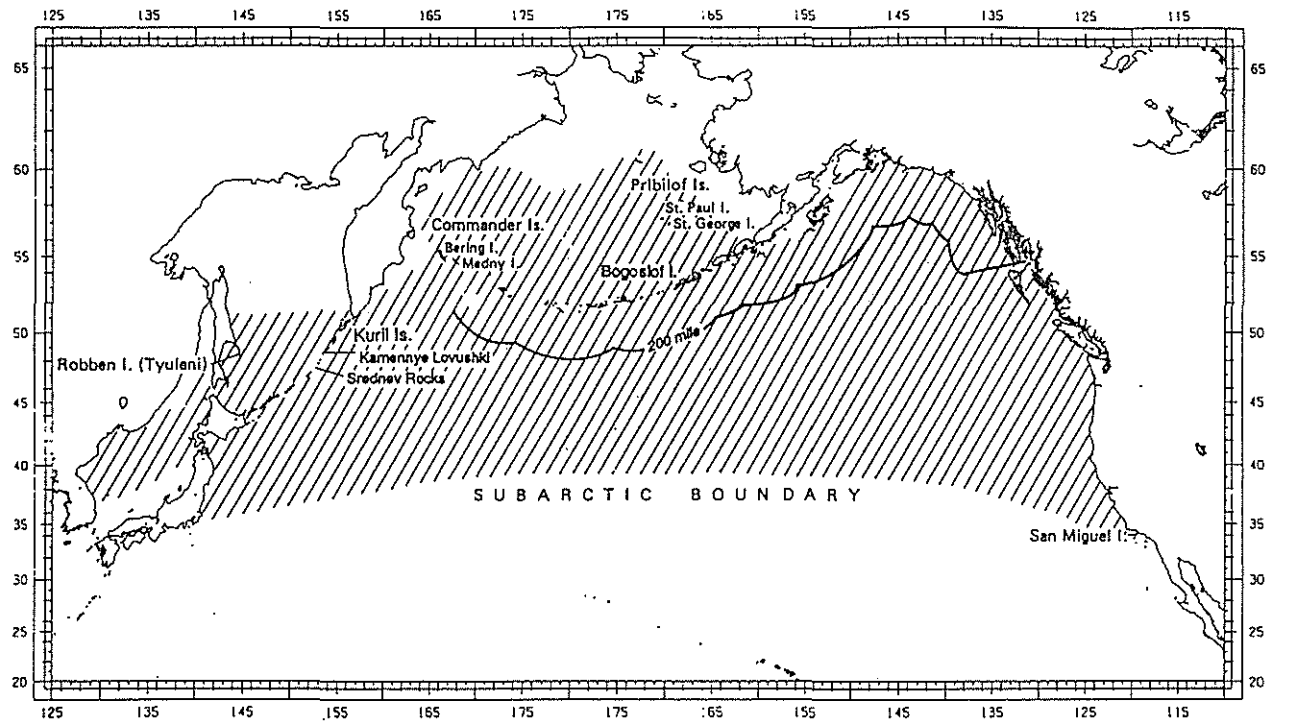

Figure 2. Range and breeding islands of the northern fur seal

Recent information on the status of northern fur seals in Russia indicates that the size of the species' second largest rookery in the Commander Islands between the western end of the Aleutian Islands and the Kamchatka Peninsula is remaining stable. However, the smaller fur seal colony on Robben Island in the Okhotsk Sea, which began declining in the mid- to late-1980s, continued to decline significantly in 1993, the latest year for which information is available. Recent population trends at rookeries in the Kuril Islands have not been studied.

Subsistence Harvest

As noted above, the commercial fur seal harvest on the Pribilof Islands ended in 1984. Before then, Aleut residents of the islands used meat and other parts of animals taken in that harvest for food and other purposes. Since the end of the commercial harvest, Aleut Natives have continued a subsistence harvest of sub-adult male fur seals.

The subsistence harvest is managed by the National Marine Fisheries Service under regulations authorized by the Fur Seal Act and the Marine Mammal Protection Act. Under these regulations, each year prior to the summer harvest, the Service is to estimate the number of seals required to meet Aleut subsistence needs on the Pribilof Islands. When the lower limit of the estimated range is reached, the harvest is to be suspended pending an assessment of whether additional seals are needed to meet subsistence needs. To develop its estimate, the Service considers previous harvest levels, economic conditions in the Native villages, and the size of the Aleut population on St. Paul and St. George Islands. Since 1992 household surveys have been conducted by the tribal government on each island to help determine the number of seals that will be needed for subsistence.

On 13 May 1994 the Service published its proposed estimate of take levels for the 1994 fur seal subsistence harvest. The results of the 1994 survey of Aleut residents were similar to those of past surveys and consistent with past harvest levels, and the Service therefore proposed the same harvest limits for 1994 as for 1992 and 1993: 281-500 fur seals for St. George Island and 1,645-2,000 for St. Paul Island.

These estimates were adopted as final estimates by the Service and published in the *Federal Register* on 12 July 1994. The 1994 harvests were below the lower limit of projected needs on both Islands, with 1,616 fur seals taken on St. Paul Island, and 161 animals taken on St. George Island. Subsistence harvest levels from 1985 to 1994 are in Table 4.

On 13 May 1994 the Service also published a proposed amendment to its regulations governing the fur seal subsistence harvest. Because actual harvest levels had remained relatively constant since 1989 and had never exceeded the upper limit of the estimated range, the Service proposed changing its regulations so that the projected subsistence harvest estimates would apply for three rather than one year, beginning in 1994. While the Service anticipated subsistence needs would increase over the next three years, based on experience it concluded that the harvest would not exceed the upper range of the 1993 estimate.

The change was supported by Aleut leaders. Some commentors, however, opposed the change, stating that subsistence needs could be met by taking fewer animals because methods used to butcher fur seal carcasses did not fully utilize all suitable parts and were therefore wasteful. They also noted that changes in the butchering method in recent years had resulted in a 22 percent (mean) decrease in the amount of carcasses being utilized, and extension of the proposed harvest estimate would therefore continue to allow harvests they felt were wasteful and in excess of subsistence harvest needs.

On 12 July 1994 the Service adopted proposed rules making the 1994 subsistence harvest estimates also applicable for 1995 and 1996. With regard to comments that the subsistence harvest practices have been wasteful, the Service's 12 July 1994 *Federal Register* notice on the final measures noted that studies of the utilization of fur seal carcasses by Natives indicate that a substantial portion of the edible parts of a seal are being used, and that the percentage amount of the carcasses being utilized had declined by only 8-9 percent (mean) in recent years with the adoption of a new butchering technique, not by 22 percent, as some commentors had suggested. The Service also noted that it intended to pursue a cooperative agreement with the Pribilof Islands' Native community to manage and monitor the subsistence harvest under new provisions of the Marine Mammal Protection Act authorized by the 1994 amendments.

Northern Fur Seal Conservation Plan

At the recommendation of the Marine Mammal Commission and as required by the 1988 amendments to the Marine Mammal Protection Act, the National Marine Fisheries Service developed and in 1993 adopted a conservation plan for the northern fur seal. The plan identifies work required to monitor population trends and determine natural or human-related causes of population changes, and measures to avoid or mitigate adverse effects of human activities on fur seals or essential habitats. To meet these objectives, tasks were identified to monitor population status and trends, evaluate causes of mortality, assess and minimize the effects of disturbance, study feeding ecology, identify ecosystem changes, study the migration and habitat-use patterns of weaned pups, and coordinate activities with other agencies and countries.

Recent activities related to the subsistence harvests are noted above and activities related to the effects of commercial fishing and fish processing are discussed below. In addition to these activities, the Service undertook a biennial survey of fur seals on the Pribilof Islands and San Miguel Island. The preliminary results indicate that the population on the Pribilof Islands is stable and that the San Miguel Island population is increasing at a rate of about six percent per year. The Service also continued or assisted field research on pup mortality, movements and foraging patterns at sea, the effect of increasing numbers of non-dominant males on reproduction and social structure in fur seal rookeries and, in consultation with the Aleut community and other scientists, physiological condition indices. Sub-adult male fur seals entangled in debris were also captured to remove the material and then released.

The Service also completed an extensive review, to be published in 1995, on the results of a 15-year study called the "St. George Experiment." Begun in 1972 to determine the effects of commercial harvesting and to study fur seal biology and ecology, the analysis presents new data on the behavior, reproduction, site fidelity, and foraging patterns of fur seals.

Table 4. Subsistence harvest levels for northern fur seals in the Pribilof Islands, 1985-1994[1]

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
St. Paul	3,384	1,299	1,710	1,145	1,340	1,077	1,645	1,482	1,518	1,616
St. George	329	124	92	113	181	164	281	194	319	161
Total	3,713	1,423	1,802	1,258	1,521	1,241	1,926	1,676	1,837	1,777

[1] Data provided by the National Marine Fisheries Service, Alaska Region.

Northern Fur Seal Stock Assessments

As part of a new approach for managing the incidental take of marine mammals in commercial fisheries, the 1994 amendments to the Marine Mammal Protection Act require that the National Marine Fisheries Service prepare draft stock assessments for marine mammal populations in U.S. waters (see also Chapter V). Among other things, the assessments are to calculate a potential biological removal level using certain population parameters and to determine whether a stock should be classified as a strategic stock requiring special management action. The Service's draft stock assessments, including assessments for two northern fur seal stocks, were provided to the Commission for review in August 1994. On 1 December 1994 the Commission, in consultation with its Committee of Scientific Advisors, returned comments to the Service.

North Pacific Stock — The Service's draft assessments considered fur seals on the Pribilof Islands and Bogoslof Island to be part of a single North Pacific stock. The draft assessment for this stock noted that only one percent of the fur seals in U.S. waters breeds outside of the Pribilof Islands (*i.e.*, on Bogoslof Island and San Miguel Island). Based on pup counts from 1989 to 1992 on the Pribilof Islands and Bogoslof Island, the Service estimated the size of the North Pacific fur seal stock to be 984,000 animals. Using a coefficient of variation, the Service determined the minimum population estimate to be 885,322 animals. Regarding the minimum population estimate, the Commission noted that the draft assessment did not identify the parameter to which the coefficient of variation applied and thus it was not possible to determine if the minimum population estimate were reasonable. The Commission therefore suggested that a more complete description and analysis be provided on the size and productivity of the stock.

Citing data from the first half of the 1900s, the Service's draft assessment for the North Pacific fur seal stock also noted that the maximum recorded growth rate has been 8 percent per year, but that until more data become available, it recommended that the maximum growth rate be assumed to be 12 percent, the general default value for all pinnipeds. With this estimate and the minimum population estimate, the Service calculated a potential biological removal level of 26,560 animals per year.

The draft assessment also discussed two sources of human-related fur seal mortality. Based on fisheries observer data from 1989 and 1993, it noted that an average of only 2.6 fur seals per year had been killed in commercial trawl fisheries and that this level was low enough to satisfy the Marine Mammal Protection Act's goal of reducing incidental mortality rates to levels approaching zero. Concerning subsistence harvests, it noted the 1993 harvest total was 1,837 fur seals and that, together with fishing mortality, human sources of mortality are far below the calculated potential biological removal level. However, because the stock is listed as depleted under the Marine Mammal Protection Act, it stated the stock would be classified as a strategic stock.

With regard to the Service's analysis of the potential biological removal level, the Commission noted that the draft assessment was flawed in that it did not identify or fully consider factors preventing the

stock's growth. That is, if the current population size is stable at levels far below historic levels, it would suggest that the removal of 26,560 animals per year would cause the population to decline, rather than grow, which is contrary to the concept of a potential biological removal level. Thus, the Commission commented that, unless it can be inferred why the stock presently is not growing, it would seem that a reasonable potential biological removal level cannot be calculated for the North Pacific stock of fur seals. The Commission therefore suggested that additional information and analysis be provided on factors limiting stock growth, including uncertainties concerning the effects of lost and discarded fishing gear and incidental take in other fisheries, such as the recently banned high-seas driftnet fisheries in the North Pacific Ocean.

San Miguel Island Stock — With regard to the San Miguel Island stock of fur seals off southern California, the Service's draft assessment noted that the estimated population size was 7,112 animals based on multiplying recent pup counts by a correction factor. This estimate was also taken to be the estimated minimum population size. For the stock's estimated maximum productivity rate, the Service noted that pup counts had increased by as much as 24 percent in the 1970s due in part to immigration of pregnant females, but it recommended using the general default value for all pinnipeds of 12 percent pending the collection of further information. From these estimates the Service calculated a potential biological removal level of 213 animals per year. The draft assessment noted that no fur seals had been reported caught incidentally in California gillnet fisheries in the past five years and that the Marine Mammal Protection Act's goal of reducing incidental taking to levels approaching zero was therefore satisfied. However, noting that the San Miguel Island stock is listed as depleted under the Marine Mammal Protection Act, the draft assessment stated that the species would be classified as a strategic stock.

In its comments to the Service, the Commission noted that, while the rapid growth of this fur seal stock indicates that it is below the lower limit of its optimum sustainable population range, the stock had, in fact, not been listed as depleted as indicated in the draft assessment. The Commission also noted that the draft assessment should provide more detail on the growth of the colony, why its estimated maximum net productivity rate should not be based on an average of the actual annual growth rate for the colony, the basis for concluding that animals in the colony are not taken incidentally anywhere within their range, and fur seal strandings associated with unusual mortality events, such as the 1982 El Niño event.

Development on the Pribilof Islands

Since the end of the commercial fur seal harvest in 1984, Native residents of the Pribilof Islands have sought to develop new economic opportunities not based on sealing by establishing an operational base for regional fishing and seafood processing industries. In this regard, port and airport facilities on St. Paul Island were improved, new seafood processing plants were constructed and began operating, and nearshore traffic from factory processing ships, fishing vessels, freighters, and fuel barges increased substantially. While the first seafood processing plant on the Islands began operating in the late 1980s, commercial activity increased significantly in late 1993 and early 1994. During that time three new seafood processing plants began operating on St. Paul Island and two new plants opened on St. George Island.

During the Commission's 16-18 November 1994 annual meeting, representatives of the Service advised the Commission that this new development appeared to be posing a potentially significant threat to fur seals and certain rookeries on the Pribilof Islands. Additional information provided shortly after the meeting noted, among other things, that in 1990 a condition previously unreported in marine mammals called "white muscle syndrome" was observed in fur seal pups at St. Paul Island rookeries close to the island's sewage outfall. Several hundred seal pups were thought to have died of the condition. While its etiology is uncertain, one possible cause might have been exposure to some sort of chemical oxidizing compound. At about the time the syndrome was observed, the municipal outfall pipe, which then carried sewage and seafood processing waste, suffered a break, allowing its effluent to be discharged close to shore.

Since 1990 separate new outfalls for processing plants have been completed and, as noted above, commercial fishing and fish processing increased significantly late in 1993 and 1994. While a recurrence of the white muscle syndrome has not been reported, other signs of impacts from outfalls and nearshore vessel discharges became apparent in 1994.

Coincident with crab processing seasons in February and September, crab shell waste, rubber packing bands, and other processing waste began washing ashore at fur seal rookery beaches close to the outfalls on St. Paul Island, indicating that discharge plumes were being carried toward rookery areas. A sharp increase also occurred in the number of fur seals found during the 1994 subsistence harvest with oil and tar stuck to their pelage in rookeries near the outfalls. Some 8 percent (about 20 animals) of the fur seals harvested from the two rookeries nearest the outfalls had tar in their pelage. As a possibly related matter, preliminary results of the 1994 fur seal population surveys on St. Paul also indicate that, while the overall number of animals on the Island was remaining steady, populations at the two rookeries closest to the outfalls and industrial area had declined in recent years.

Both the seafood processing outfalls and processing ships using nearshore waters are potential sources of such impacts. With regard to the outfalls, numerous installation and design problems arose, resulting in discharges closer to shore than permitted. Under conditions of a general ocean discharge permit issued by the Environmental Protection Agency, outfall pipes from seafood processing plants were to extend at least one-half mile from shore. Some apparently did not extend that far, and the new outfalls from two plants on St. George suffered ruptures and leakages in 1994 allowing nearshore discharge. Portions of some plastic outfall pipes also rose to the surface and part of one pipe broke off and washed ashore on a fur seal rookery beach.

With the opening of the new processing plants late in 1993, nearshore vessel traffic also increased substantially and many vessels, including factory processing ships, anchored close to shore. In 1994 two fishing vessels grounded along the Pribilof Islands' coast, one off a fur seal rookery on St. Paul Island and the other near marine mammal and seabird habitats on St. George Island. Fuel and other contaminants were removed from the former vessel shortly before fur seals began arriving at the Islands in May and the vessel was towed to sea and sunk. The vessel that grounded on St. George Island broke up, releasing fuel, oil, and debris into the sea.

To address problems associated with the discharge of seafood processing waste, the Environmental Protection Agency in July 1994 proposed modifying its general permit for such discharges in Alaska (including those by vessels) to allow discharges only beyond one nautical mile, rather than one-half nautical mile. At the end of 1994, however, it was the Commission's understanding that the Environmental Protection Agency had decided to allow processors in the Pribilof Islands to continue operating under the existing permit pending the issuance of a new permit, and that a meeting of concerned parties had been scheduled for early in 1995 to discuss mitigation measures that should be taken in the Pribilof Islands.

Pacific Walrus
(*Odobenus rosmarus divergens*)

Walruses, the sole species in the taxonomic family Odobenidae, occur in discrete populations around most of the Arctic Ocean and some of its adjacent seas. There are at least two and perhaps three subspecies, one of which is the Pacific walrus. The Pacific subspecies is considered to be a single stock that ranges over the continental shelf of the Bering and Chukchi Seas between Alaska and the eastern coast of Russia (Figure 3). Their northern limit is set by the edge of the permanent pack ice and their southern extent along the north coast of the Alaska Peninsula approximates the 10°C isotherm of the average July air temperature. Walruses are an essential subsistence resource for Native communities in both the United States and Russia and, because of their foraging behavior for mollusks and other invertebrates buried in the sea floor, walruses exert an important influence on the ecology of the Bering and Chukchi Seas.

Most Pacific walruses migrate seasonally with movements synchronized with the advance and retreat

of the sea ice. When the pack ice reaches its maximum between January and March, walruses are confined to the Bering Sea, principally south and west of St. Lawrence Island and south and east of Nunivak Island. By August, most animals have moved north into the Chukchi Sea between Wrangel Island, Russia, and Harrison Bay east of Barrow, Alaska. However, some animals, mostly adult males, remain year-round in the Bering Sea.

The Pacific walrus population probably represents 80 to 90 percent of all walruses worldwide, and is the only one to have recovered substantially from past episodes of excessive commercial hunting. Since the mid-1800s the Pacific walrus population has gone through at least three cycles of depletion, brought about by excessive commercial hunting, and subsequent recovery. In the 1860s walruses were hunted intensively for oil and ivory by American whalers who, for the first time, introduced the widespread use of firearms to kill animals. During the 1870s the reduced availability of walruses caused widespread starvation and death among Native populations in the Bering Sea area. With reduced abundance, commercial hunting pressure diminished and walrus numbers rebounded late in the 1800s.

In the early 1900s Pacific walruses were taken by U.S., Canadian, and Norwegian traders to use in bartering for furs with Alaska and Chukotka Natives. This practice declined in the 1920s, and the walrus depletion apparently was not as great as that caused earlier by whalers. In the 1930s, however, Russian hunters mounted a major commercial effort to exploit walruses for their hides, oil, and ivory. Recorded catch data for that decade suggest average annual landings of about 8,500 animals, not including animals struck and lost. By the mid-1950s walrus numbers had again been reduced severely. Their most recent recovery occurred in the 1960s and 1970s in response to protective measures adopted independently by the State of Alaska and the Soviet Union.

Between 1975 and 1990 the United States and the Soviet Union undertook a series of cooperative range-wide walrus surveys every five years. The surveys were conducted in the fall when most walruses were concentrated along the edge of the pack ice in the Chukchi Sea and at haulouts along the Russian coast and in Bristol Bay. Population estimates calculated from those surveys ranged between 246,360 animals in 1980 and 201,039 animals in 1990.

While the resulting estimates are useful for indicating a minimum number of walruses present at the time of a survey, analytical limitations inherent in the surveys preclude the use of their results to detect recent population trends or to calculate a reliable estimate of total population size. Among the fundamental problems preventing such analyses are the unknown percentage of animals underwater and not visible at the time of the survey, and the highly aggregated yet variable distribution of walruses across vast Arctic areas. Regarding the latter factor, the location of walrus concentrations varies so greatly both within and between years that sampling is difficult, given the limited resources available for aircraft and ship time. Thus, while the surveys suggest that the Pacific walrus population has remained above 200,000 animals over the past 20 years, estimates of population size and trends are uncertain.

Subsistence Harvests of Walruses

Northern Native peoples harvested walruses for thousands of years using harpoons and lances. Among other things, the animals provided meat for food, oil for fuel, hides for constructing houses and boats, and ivory for making tools such as harpoon tips. Today, the harvest of walruses continues to be important for Native communities, providing a source of food as well as ivory that can be worked into handicraft items and sold to provide vitally needed income. To accommodate these subsistence and handicraft needs, the Marine Mammal Protection Act exempts Alaska Natives from its moratorium on taking marine mammals, provided that harvested animals are taken in a non-wasteful manner.

Natives in more than 20 villages from Bristol Bay to northern Alaska may engage in hunting walruses. At least 50 to 80 percent of the harvest, however, is taken by residents of three villages — Gambell and Savoonga on St. Lawrence Island and Diomede on Little Diomede Island in the Bering Strait. Most hunting is now done from small boats using rifles to take animals that haul out on ice and, to a lesser extent on land, as they migrate north in early spring.

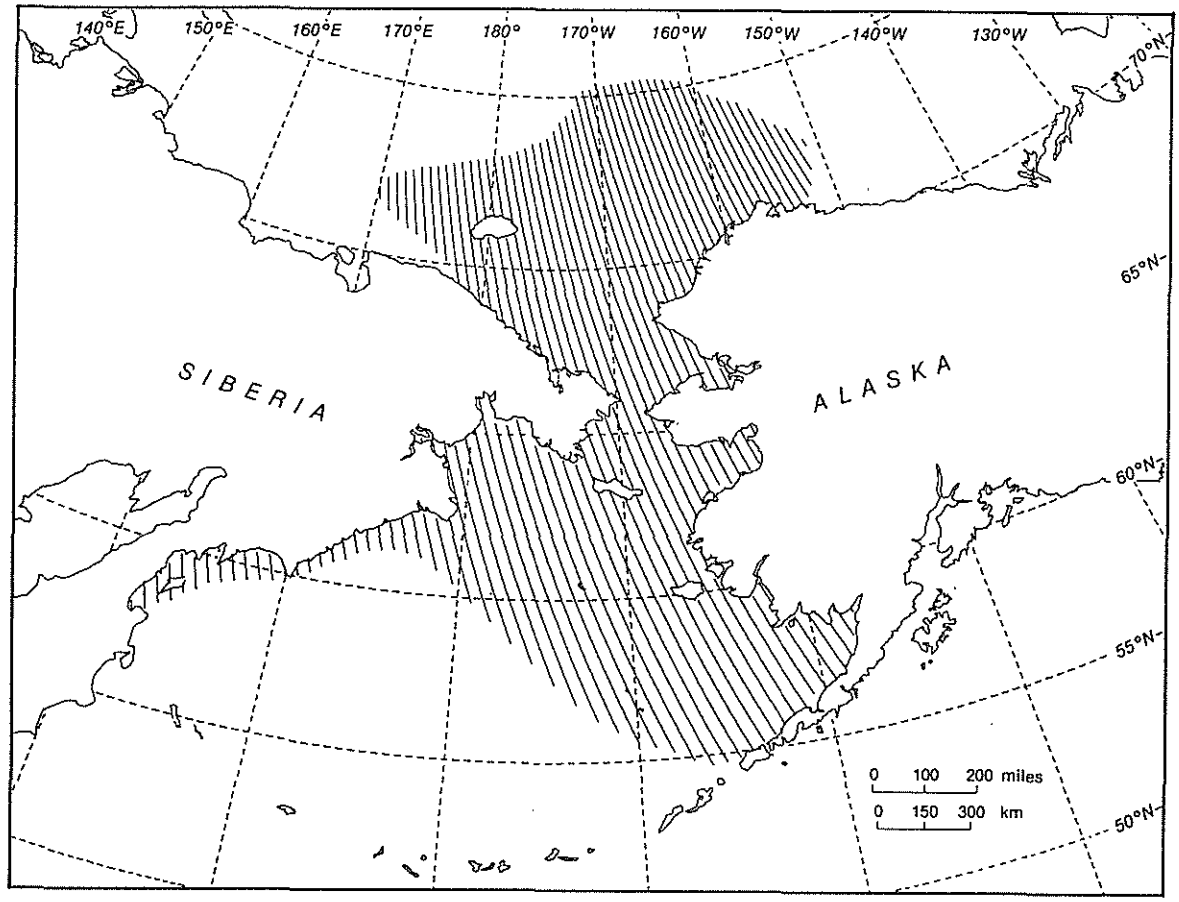

Figure 3. Range of the Pacific walrus

Table 5 provides catch estimates for Pacific walruses landed in Alaska and the Soviet Union since 1970. The estimates for Alaska prior to 1979 are based on a harvest monitoring program conducted by the Alaska Department of Fish and Game that monitored catch in most walrus-harvesting villages. Beginning in 1980 the estimates were extrapolated from data gathered cooperatively by the Fish and Wildlife Service and the Alaska Eskimo Walrus Commission from April to June in five villages. Because of funding limitations, the harvest monitoring program was suspended in 1990 and 1991. It was resumed in 1992 and now is used to monitor catch in four major harvesting villages. The program also provides an important opportunity to collect biological samples for various analyses (*e.g.*, reproductive condition, age determination, and contaminant analyses). In this regard, arrangements have been made to archive walrus tissues provided by cooperating Native hunters in the National Marine Mammal Tissue Bank (see Chapter VII). Liver, kidney, and blubber samples from several animals already have been added.

Not factored into the catch estimates in Table 5 are animals that escape but are mortally wounded and those that die instantly but sink before being retrieved. In the latter case, animals killed outright may simply roll off the edge of an ice floe as they collapse or be pushed into the water by fleeing companions. A recent analysis of data on animals struck and lost during Alaska walrus hunts observed from 1952 to 1972 concluded that 42 percent of the animals struck by bullets were lost. More than half of these appeared to have been killed instantly. Based on the

number of beached carcasses with evidence of healed bullet wounds, it appears that very few animals struck by bullets but not killed instantly recover from their wounds. Thus, estimates in Table 5 may reflect only about 60 percent of the total number of animals killed by hunters, and the Service has expressed concern that the total catch in the United States and Russia may have exceeded replacement levels in some years.

Table 5. Catch of Pacific walruses in Alaska and the former Soviet Union, 1970-1994 (Estimates do not include animals struck and not retrieved.)

Year	Alaska Catch	Soviet Catch	Total Catch
1970	1,422	988	2,410
1971	1,915	897	2,812
1972	1,325	1,518	2,843
1973	1,581	1,291	2,872
1974	1,410	1,205	2,615
1975	2,378	1,265	3,643
1976	2,989	1,253	4,242
1977	2,377	1,461	3,838
1978	2,224	2,120	4,344
1979	2,510	1,526	4,036
1980	2,289	2,653	4,942
1981	3,318	2,574	5,892
1982	2,053	3,569	6,072
1983	2,136	3,946	6,082
1984	3,981	4,424	8,405
1985	3,529	4,708	8,237
1986	2,650	3,884	6,534
1987	2,077	4,673	6,750
1988	1,925	3,989	5,914
1989	488	3,677	4,165
1990	--	2,435	--
1991	--	1,860	--
1992	1,485	1,750	3,235
1993	1,352	--	--
1994	1,669	--	--

Sources: Fay, F.H., and C.E. Bowlby. 1994. The harvest of Pacific walrus, 1931-1989. Technical Report MMM 94-2. U.S. Fish and Wildlife Service, Anchorage, Alaska. 44 pp.
Data for 1990-1994 from Fish and Wildlife Service.

Another source of data on walrus harvest levels is a marking and tagging program begun by the Service in 1988 to monitor trade in walrus ivory and acquire additional information on walrus harvest levels (see Chapter IX). Under the program, tusks from 1,466, 2,167, 1,672, 1,168, and 1,147 walruses were tagged in 1990 to 1994 (preliminary), respectively. The yearly tagging total, however, does not equal the total catch because harvested calves, which lack tusks, are not usually tagged. It is not clear how tagging data are correlated with the harvest estimates in Table 5; however, catch estimates from the harvest monitoring program in 1992 and 1993 (1,485 and 1,352) compare favorably with the tagging data for those years (1,672 and 1,168).

Adoption of a Walrus Conservation Plan

In 1988 the Marine Mammal Commission provided the Fish and Wildlife Service with a series of species accounts with research and management recommendations for certain Alaska marine mammals, including Pacific walruses (see also Chapter IX). At that time the Commission recommended, among other things, that the Service use the walrus account to prepare a conservation plan identifying priority research and management needs for the Pacific walrus population.

The Service agreed that a conservation plan would benefit species conservation by helping efforts to identify priority research and management actions, coordinate activities with interested parties, and facilitate budget planning. It therefore began work to develop a plan, seeking assistance and advice from Federal and State agencies, the Native community, industry, and others. However, development of the plan was soon interrupted by demands from the *Exxon Valdez* oil spill in March 1989. The Commission therefore offered to contract for the development of a draft walrus conservation plan that could be provided to the Service. The Service agreed and in December 1991 the Commission forwarded the contractor's recommended draft plan. During 1992 the Service asked the Walrus Management Plan Advisory Team, established to assist in developing a plan, to review the draft plan and early in 1993 the Service circulated a draft management plan for review. The Service's draft included several fundamental differences from the draft provided by the Commission, including a

new proposed approach to regulate Native harvests that required amending the Marine Mammal Protection Act.

As discussed in the previous annual report, the Commission provided comments on the draft plan to the Service on 23 March 1993 and, based on comments by the Commission and others, the Service revised the plan and requested further comments in May 1993. The Commission returned comments on 24 June 1993, noting the plan was much improved but that it still called for amending the Marine Mammal Protection Act to allow regulating Native harvests if hunting and other activities appear likely to cause populations to be reduced below optimum sustainable levels. In this regard, the Commission urged that the Service first seek to work with affected Native groups and the State of Alaska to reach agreement on situations where emergency management authority would be required and what that authority should entail before adopting a regulatory approach.

At the end of 1993 the Service circulated another revised plan for comment. The new plan called for reliance on developing a cooperative agreement with Alaska Natives to manage the walrus harvest. On 11 March 1994 the Commission submitted further comments. Among other things, it noted that the Service's relationships with the Alaska Eskimo Walrus Commission and other groups should offer an excellent opportunity for formally coordinating walrus conservation measures and that, based on the best available information on the size of the walrus population, the Service should recommend harvest levels with clear warnings about the potential for change in those figures.

In June 1994 the Service adopted a final Conservation Plan for Pacific Walrus in Alaska calling for co-management of the subsistence walrus harvest with Alaska Natives under cooperative agreements with Native organizations. Other parts of the plan identify tasks to (1) determine the status and trends of the Pacific walrus population, (2) define its optimum sustainable population range and protect essential habitats, (3) identify and manage human activities other than subsistence hunting that may affect the walrus population, (4) establish informational and educational programs to promote conservation objectives, and (5) coordinate Federal, State, Native, and international conservation efforts.

At the end of 1994 a new agreement with the Alaska Eskimo Walrus Commission on co-management arrangements for the subsistence walrus harvest had not yet been developed. It was the Marine Mammal Commission's understanding that the Service expected this matter to be discussed during a Walrus Commission meeting scheduled for March 1995.

Development of Walrus Agreement with Russia

On 6-9 September 1994 representatives of the Commission participated in a meeting in Nome, Alaska, to discuss possible agreements between the two countries and their respective Native communities on cooperative measures to conserve polar bears and walruses. Also participating were representatives of Alaska Native communities and other government officials from the United States and Russia. Representatives of the Russian Native community were to have participated but were unable to do so.

On the final day of the meeting, representatives of the U.S. Fish and Wildlife Service and Russia's Main Department of Biological Resources signed a protocol of intent to develop a bilateral agreement on cooperative measures to conserve and manage the Pacific walrus population. Among other things, the agreements are to include measures for sharing information on the status of the Pacific walrus population, managing and monitoring all removals, establishing joint management arrangements with affected Native communities, undertaking joint field and laboratory research, and coordinating other walrus conservation and management activities. In addition to the government-to-government agreement, the protocol envisioned a parallel agreement between the Native communities of the two countries.

Under the protocol, representatives of the two governments agreed to work together with their respective Native communities to prepare proposals for the agreement. The next formal meeting between representatives of the two countries to pursue a bilateral agreement is expected to be in the fall of 1995. At that meeting, participants will discuss the

topics to be covered under the agreement and the schedule for its development.

Joint U.S.-Russian Walrus Survey

As noted above, the United States and the former Soviet Union undertook joint range-wide surveys of the Pacific walrus population at five-year intervals between 1975 and 1990. Recent analyses of the surveys, however, indicate that these studies provide limited information on the size and trend of the Pacific walrus population. The range-wide surveys are also expensive to undertake and, as noted in the previous annual report, Russian participants in a joint U.S.-Russian meeting on marine mammals in December 1993 advised that they were not able to commit the resources necessary for another survey in 1995.

In view of these developments, no plans were made to carry out a survey in 1995. At the end of 1994 it was the Commission's understanding that the Service remained interested in the possibility of undertaking another joint survey at some future date, provided the quality of such data can be improved to an acceptable level and funding priorities permit. The earliest date such a project could be undertaken is 1997.

Contaminant Analyses

As noted in the previous annual report, a study of heavy metal contaminant levels in walrus kidneys and livers completed by the Service in 1993 found high levels of cadmium and mercury. The Alaska Department of Health and Social Services reviewed the results of the study and concluded that it was not necessary to recommend that Natives restrict their consumption of walrus meat and other parts. However, the contaminant levels reported exceeded the level (13 mg/kg) thought to interfere with organ function in some animals. The Service therefore continued studies of heavy metal contaminant loads in walruses.

In 1994 the Service completed analyses for 19 heavy metals in walrus kidney and liver samples collected throughout the Bering Sea during a joint U.S.-Russian research cruise in 1991. The results were reported at an Arctic Science Conference held in late August and early September 1994, first in Anchorage, Alaska, and then in Vladivostok, Russia. The results confirm the earlier findings that cadmium and mercury levels in walrus kidneys and livers are high and that they increase with the age of the animal. The reported mean levels of cadmium in the livers and kidneys of 178 animals sampled were 122.52 ppm and 19.86 ppm, respectively. The results provide important baseline data from which to detect future trends in these contaminant levels. The results were also provided to the Alaska Department of Health and Social Services.

To assess whether these contaminants are having an effect on the health of walruses, the Service has collected tissue samples from the Alaska subsistence harvest over the past three years for studies of contaminant levels and histopathology. The Service has been unable to fund the analyses to date; however, at the end of 1994 it received a grant to initiate the analyses in 1995.

Effects of Tourism on Walruses

During the summer, some walruses haul out on beaches along the coast of eastern Russia and Bristol Bay. Some of these sites have become popular attractions for tourists and tour boats. Because walruses are sensitive to noise and disturbance, human activities associated with tourism may alter normal behavior and haulout patterns and cause animals to abandon preferred beaches. As discussed in previous annual reports, one such area that has become a significant attraction is Round Island in northern Bristol Bay. Round Island is part of the Walrus Islands State Game Sanctuary established in 1960 and, to minimize visitor impacts to walruses and other wildlife, access to the Sanctuary is limited by permit.

During a joint U.S.-Russia meeting on 6-10 December 1993 in Anchorage, Alaska, to review marine mammal research and management issues of mutual concern, Russian participants noted that walrus haulout sites on the Russian coast of the Bering Sea were becoming popular attractions for increasing numbers of summer tour boats. Concern was raised about the effects of disturbance from such activities on walruses. In partial response, the Fish and Wildlife Service offered to send a biologist knowledgeable in studying walrus behavior to work with Russian

scientists. The offer was accepted and in the summer of 1994 a Service representative spent three weeks on Arakamchechen Island in the northern Bering Sea near the Bering Strait.

During the visit, valuable baseline data were collected on walrus haulout behavior and a report on the results is to be completed in 1995. There was no opportunity to observe the effects of tour visits, however, because only a single ship visited the island during the study period and walruses were not using the haulout beach on the day it stopped. Further cooperation between Russia and the United States to assess such effects and possible management measures is expected to be discussed in 1995 and will be considered in developing the above-noted bilateral agreement on conserving the Pacific walrus population.

Pacific Walrus Stock Assessment

As noted elsewhere in this report, the Fish and Wildlife Service prepared stock assessments in 1994 for marine mammal populations under its jurisdiction in response to the 1994 amendments to the Marine Mammal Protection Act. The assessments are required as a part of efforts to manage the incidental take of marine mammals during the course of commercial fishing operations (see Chapter V) and, among other things, are to include an estimate of the potential biological removal that can be safely supported based on the population's size and productivity. In August 1994 the Service provided its draft stock assessments, including one for Pacific walrus, to the Commission for review.

The draft assessment for Pacific walrus noted that, based on National Marine Fisheries Service observer data from 1977 to 1993, an average of only 12.8 walruses is taken annually by groundfish trawl vessels and that at least a portion of those animals were already dead. This level was far below the level considered adequate to satisfy the Marine Mammal Protection Act's goal of reducing incidental take to levels approaching zero.

The draft assessment also noted that, while the most recent (1990) range-wide survey estimate of 201,039 animals should be recognized as the best estimate of the lower limit of population size, using the results of that survey the Service concluded that the minimum estimate to be used for calculating the potential biological removal level should be 188,316 animals. It also noted that maximum growth rates for walruses range from 3 to 18 percent, most estimates for the annual productivity rate for walruses range from 5 to 10 percent, and an accepted general value for the maximum reproductive rate of pinnipeds is 12 percent. Noting that most pinnipeds have a one-year breeding cycle and walruses have a two-year breeding cycle, the Service concluded that a 6 percent rate should be considered the maximum net productivity rate for walruses, even though rates of up to 13 percent had been reported and the upper limit of many reported rates was 10 percent. Based on these levels, the Service calculated that the potential biological removal level for Pacific walruses was 5,649 animals per year.

Under the 1994 amendments, when takes from all sources exceed the estimated potential biological removal level, the population is to be designated a strategic stock requiring establishment of an incidental take reduction team. Noting that the harvest of Pacific walruses by Russian and Alaska hunters over the past 30 years has averaged 7,500 animals (including an estimate for animals struck and lost), the Service concluded that the Pacific walrus should be considered a strategic stock.

On 1 December 1994 the Commission wrote to the Fish and Wildlife Service providing comments on its draft stock assessments. Concerning Pacific walruses, the Commission noted that the rationale for determining estimates of the minimum population size and maximum productivity rate were unclear. It also noted that it was not clear why the average harvest level over the past 30 years was used to determine whether current removals exceeded the calculated potential biological removal level. In this regard, the Commission noted that, if the 1990 survey estimate of 201,039 animals was used as the best estimate of minimum population size and if the average harvest level since that survey was used to measure current removals, the assessment would conclude that harvest levels are near but not above the potential biological removal level. As a related point, the Commission noted that cooperative agreements with Native hunters

under the recently adopted walrus conservation plan and the development of a bilateral agreement with Russia provided appropriate means of resolving uncertainties regarding future harvest levels.

Therefore, the Commission recommended that the Service reconsider its rationale for concluding that current removals exceed the potential biological removal level and that the assessment be expanded to describe uncertainties regarding the status of the population and current threats. At the end of 1994 the Service was revising its walrus stock assessment to take account of comments by the Commission and others.

Northern Right Whale (*Eubalaena glacialis*)

The northern right whale, prized for the quality and quantity of its baleen and oil, was the first of the great whales to be targeted by a whaling industry. Catch records date back to the 11th century when Basque fishermen along the coasts of present-day France and Spain harpooned right whales from shore-based rowboats. By the 14th century, Basque whaling ships were hunting right whales in the English Channel, and by 1530 they had crossed the Atlantic Ocean and begun full-scale whaling operations in the northwest Atlantic off present-day Newfoundland and Labrador.

In the North Pacific Ocean, right whales were taken in nets by Japanese shore-based whalers in the 1600s and perhaps earlier. Native communities in the Pacific Northwest and Aleutian Islands also may have taken right whales although gray whales appear to have been the principal species taken. Intensive whaling in the North Pacific began in the mid-1800s when Yankee whalers discovered concentrations of right whales in the Gulf of Alaska and off the Kamchatka Peninsula. Between 1839 and 1846 the number of American whaling ships in the North Pacific increased from 2 to nearly 300, and by 1860 right whale stocks in the Pacific were commercially extinct. Whalers then turned their attention to other species, but northern right whales continued to be taken opportunistically and their numbers were reduced even further.

The long, intensive focus of commercial whalers on northern right whales left the species dangerously close to biological extinction. Despite adoption in 1935 of a ban on commercial hunting of right whales under the first International Convention for the Regulation of Whaling, northern right whale populations have remained at perilously low levels. Today, the largest known population, and the focus of greatest conservation effort, is in the western North Atlantic where right whales number about 300 animals. The near absence of right whale sightings over the past 40 years off the European continent suggests that the stock once found in the eastern North Atlantic is close to being extirpated.

At least a few northern right whales still survive in the North Pacific Ocean; however, the current number and distribution of animals are unknown. Sightings over the past several decades have been rare, widely scattered, and include no reports of calves. If a viable population remains in the North Pacific basin, it probably occurs in waters off the Kuril Islands or the Kamchatka Peninsula of eastern Russia.

In the western North Atlantic, right whales occur seasonally in at least three areas along the east coast of the United States and two areas off Canada. The principal and only known calving ground for the population is along the coasts of northern Florida and Georgia. This area is used almost exclusively from December to March by females with newborn calves and some juveniles. Between 1984 and 1989, up to 91 percent of the total number of calves identified each year in the western North Atlantic were first seen here. Between 1989 and 1992, 76 percent of the identified calves were born or spent their first months of life in this area.

The other four known seasonal habitats are feeding areas off New England and southeastern Canada. Zooplankton, primarily copepods, are the species' principal prey. In spring right whales regularly occur in Cape Cod Bay and the Great South Channel off Massachusetts. The former area is used mostly between February and May. Assuming an absolute maximum population size of 350 whales, this area was

used annually between 1984 and 1989 by at least 4 to 12 percent of the total population and 14 to 75 percent of the identified calves. The latter area, centered 40 miles southeast of Cape Cod, is used principally between April and June. Between 1984 and 1989 it was used annually by at least 6 to 22 percent of the total population and up to 57 percent of the identified calves. In summer months, right whales, including a significant number of cow-calf pairs, occur regularly in the Bay of Fundy just north of the U.S.-Canada border. In late summer and early fall, Browns Bank off the southern tip of Nova Scotia is used.

Although no commercial hunting of right whales is known to have occurred in the western North Atlantic since at least the 1930s, other human activities may be preventing its recovery. Both collisions with ships and entanglement in fishing gear are documented causes of right whale mortality. Of 32 known right whale mortalities in the western North Atlantic from 1970 to the end of 1994, nine whales (28 percent) died as a result of ship strikes and two (6 percent) as a result of entanglement in fishing gear.

Based on a 1990 analysis of photographs in the right whale photo-identification catalogue, a significant number of animals also bears scars or other evidence from interactions with ships (7 percent or 12 of 168 animals) and fishing gear (57 percent or 67 of 118 animals). Given the very low number of calves documented annually (ranging between 7 and 17 since 1981), the loss of any individuals, particularly females and calves, can significantly impede recovery. At the end of 1994 eight births were confirmed for the year; however, one calf sustained severe injuries from an apparent entanglement and ship collision and is presumed to have died (see below). Because a carcass was not recovered, it is not included among the known entanglement and ship-related deaths.

Recent Right Whale Injuries and Deaths

As noted in the previous annual report, two dead right whales were recovered in 1993. Both were calves found in the Florida/Georgia calving ground. One was accidentally struck and killed by a Coast Guard vessel. This was the fourth time in three years that a ship is known to have struck a right whale on the calving ground. The other calf died of unknown causes apparently unrelated to human activities. Another dead whale photographed floating off Cape Charles, Virginia, in December 1993 was not reported until well into 1994. The animal, apparently a female struck and killed by a ship, raised the total known mortality in 1993 to three animals.

At the end of 1994 there had been one confirmed right whale death for the year. The animal was a male that washed ashore in June on Kent Island in the Bay of Fundy off New Brunswick, Canada. The cause of death could not be determined but did not appear to be human-related. Also, late in February a severely injured right whale calf was sighted off Florida. The lateral tail flukes on either side had been nearly cut off and the calf appeared to be unable to dive or use its tail. Another deep cut was visible on the animal's rostrum. While no entangling lines were seen on the animal, based on a close inspection and detailed photographs of the wounds, it appeared that the injuries had been caused by a recent entanglement and propeller strike. The calf and its mother were re-sighted the following day nearly 20 miles north. Neither the mother nor the calf was resighted in 1994 on the species' northern feeding ground and it seems likely that the calf died of its injuries.

There also were reports of four other entangled right whales in 1994. Three different animals were seen entangled in lines on separate occasions during summer right whale surveys in the Bay of Fundy. Observers were not able to attempt to remove the entangling line and a positive identification as to the source of the lines was not possible. In November 1994 a fifth entangled right whale was seen in Ipswich Bay, north of Gloucester, Massachusetts. The entangling material was synthetic line similar to float lines used to mark lobster traps and gillnets but could not be identified positively as to source. A right whale response team composed of people from the Center for Coastal Studies, the International Wildlife Coalition, and the New England Aquarium was able to locate the animal again, remove most of the entangling material, and release the whale alive.

In December a one-year-old male right whale, which had been photographed as a calf off Florida in January 1994, entered the lower Delaware River between the mouth of Delaware Bay and Philadelphia

and remained there several days. Although some superficial wounds possibly caused by collisions with vessels, docks, or the bay bottom were observed, the animal had no apparent serious injuries or entangling debris. A radio tag was attached in order to track the animal and help keep ships away from it. After a week, the animal left the bay, apparently unharmed.

Right Whale Critical Habitat

In May 1990 a right whale recovery team, constituted by the National Marine Fisheries Service to help develop a recovery plan for the species, petitioned the Service to designate three areas as critical habitat for right whales under the Endangered Species Act. The three areas included the winter calving ground off northern Florida and Georgia and two spring feeding areas off Massachusetts, one in Cape Cod Bay and the other in the Great South Channel. The Service published a *Federal Register* notice in July 1990 announcing receipt of the petition and requesting comments and information.

The Marine Mammal Commission responded to the Service on 26 September 1990 noting that the action appeared warranted, but that the petition did not fully describe the supporting information and rationale. The Commission therefore advised the Service that it was contracting for a report to synthesize relevant data. The contractor's report was completed early in 1991 (see Appendix B, Kraus and Kenney 1991) and on 31 May 1991 the Commission, in consultation with its Committee of Scientific Advisors, sent it to the Service, recommending that all three areas promptly be designated as critical habitat. By fall 1992 no further steps had been announced and the Commission wrote to the Service on 18 October 1992 asking about the petition's status. The Service's 24 November 1992 response advised that it planned to publish a proposed rule in January 1993.

On 19 May 1993 the Service published proposed rules to designate all three areas in the petition as critical habitat. Background information accompanying the proposed action noted that vessel traffic and commercial fishing were activities warranting special management consideration; however, measures to address these activities were not included. The Commission, in consultation with its Committee of Scientific Advisors, responded to the proposed rules on 15 July 1993.

In its letter, the Commission expressed support for the designation but recommended that the rules be expanded to include measures to reduce the likelihood of whales being struck by ships or entangled in fishing gear. Specifically, it recommended that the rules (1) prohibit the use of unattended drift and sink gillnets in all three areas during periods of peak whale abundance, and (2) require that ships crossing the right whale calving ground from ports along Florida and Georgia travel at slow speed, post whale observers, and maintain courses as close to perpendicular to the coast as possible during the winter whale season.

With regard to the first point, the Commission noted that restrictions on gillnets were needed, given the high percentage of right whales seen with entanglement-related scars and documented entanglement-related mortality. Concerning ship collisions, the Commission noted that during the previous three years, two right whales had been killed by ships off Florida, other right whales had been seen in the area with fresh scars from apparent ship strikes, and several near-collisions with right whales had been documented by hopper dredges carrying dredge spoil to offshore dump sites near the Florida-Georgia border.

On 3 June 1994 the Service published final rules designating all three areas as critical habitat. The rules, however, did not restrict any activities threatening right whales in the designated areas. The effect of the designation therefore is limited to (1) highlighting for the public and government agencies the special importance of these right whale habitats, and (2) notifying Federal agencies of their obligation to consult with the Service to identify and avoid any actions that could adversely affect right whales or the habitat features critical to their survival.

Along with the final rules, the Service published its response to comments received on the proposed designation. With respect to recommendations made by the Commission, and others apparently, on the need for managing vessel traffic and the deployment of fishing gear, the Service noted that it had recently extended a prohibition on setting sink gillnets for groundfish in

a portion of the Great South Channel critical habitat (see below); the Southeastern U.S. Right Whale Recovery Plan Implementation Team formed by the Service in August 1993 was taking steps to prevent ship strikes off Florida and Georgia (see below); and the Service would continue to focus management efforts on reducing right whale mortality due to ship strikes and entanglement.

New England Groundfish Fishery

In October 1993 the National Marine Fisheries Service asked for the Commission's comments on Amendment 5 to the Northeast Multispecies Fishery Management Plan prepared by the New England Fisheries Management Council. The plan sets forth provisions to manage commercial trawl, longline, and sink gillnet gear used for catching several groundfish species along the northeastern U.S. coast.

Among other things, the amendment proposed extending a fishing area closure in the Great South Channel for sink gillnets. The closure, first established in 1986 to protect a haddock spawning ground, prohibited all groundfish fishing in the area from 1 February to 31 May. Because haddock no longer appear to spawn in the area, the Council concluded that the closure was no longer needed to protect fish resources. However, to protect right whales that also occur in the area in spring, the Council recommended that the existing closure be continued for sink gillnets.

On 15 November 1993 the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, provided comments to the Service on Amendment 5. Among other things, the Commission noted that the proposed closure overlapped a proposed critical habitat area for right whales and would help reduce the risk of entanglement. It also noted, however, that the boundaries of the haddock closure did not include all of the proposed critical habitat and that the effective period did not cover the entire April-to-June peak period of right whale abundance in the Great South Channel. In addition, the Commission noted that no measures were proposed to limit gillnets in the proposed Cape Cod Bay critical habitat. Therefore, the Commission recommended that the Service revise the boundary of the haddock spawning closure area to match that of the proposed Great South Channel critical habitat and that the time period be changed from February through May to April through June. The Commission also recommended that the Service close waters within the proposed Cape Cod Bay critical habitat to sink gillnets between February and May when right whale abundance is greatest.

On 30 November 1993 the National Marine Fisheries Service issued a biological opinion on the Council's proposed amendment pursuant to section 7 of the Endangered Species Act. Regarding right whales, the opinion concluded that the proposed action would not adversely affect right whales or habitat critical to their survival; however, it also suggested conservation measures similar to the recommendations made by the Commission. The opinion referred the Council and the Service's fishery managers to needed conservation actions in the right whale recovery plan. Among other things, the plan notes the need to restrict use of entangling fishing gear in right whale high-use areas during the periods when whales are most likely to be present. The opinion also recommended that actions, such as time-area closures, be taken to reduce the entanglement of endangered whales.

On 1 March 1994 the Service published final rules to implement Amendment 5 of the fishery management plan. With respect to right whales, the Service rejected the Commission's recommendation that the boundaries and time period of the haddock area closure be altered. The Service's accompanying response to comments explained that its biological opinion had concluded that the proposed action would not adversely affect right whales in the Great South Channel or Cape Cod Bay and the change was therefore not necessary. It also stated that, if these areas were designated as critical habitat, it might be appropriate to consider such changes at that time.

As noted above, no such measures were included in the Service's June 1994 rules designating the areas as critical habitat. As a result, the sink gillnet closure implemented by the Service to protect right whales does not cover the entire Great South Channel area designated as critical habitat nor the entire period of peak whale abundance. Also, no direct action has been taken to reduce the risk of right whale entanglement in gillnets in either Cape Cod Bay or the south-

eastern U.S. calving ground where right whales are known to occur most frequently.

However, two separate actions not motivated by right whale conservation interests were taken in 1994 that offer whales some protection from the threat of entanglement. First, in November 1994 Florida voters approved a referendum to limit use of gillnets in the State's coastal waters. The measure prohibits gillnets within one mile of the Atlantic coast, including part of the northern right whale's winter calving ground, and within three miles of the Gulf of Mexico coast. Second, to prevent commercial extinction of New England groundfish stocks, the Service imposed an emergency rule on 12 December 1994 banning all groundfish fishing in three major fishing areas on Georges Bank, including part of the Great South Channel. The emergency action will be in place for at least 90 days pending development of Amendment 7 to the Northeast Multispecies Fishery Management Plan. In developing the new amendment to establish permanent rules to better protect remaining fish stocks, the Council may give further consideration to measures limiting gillnet fishing in important right whale habitat.

Northern Right Whale Stock Assessment

Amendments to the Marine Mammal Protection Act passed in 1994 require, among other things, that the National Marine Fisheries Service prepare stock assessment reports for marine mammal stocks in U.S. waters (see Chapter V). The assessments, which are to provide a basis for managing impacts from fishing operations and other human activities, are to include various information and findings, including values for key population parameters, an estimate of the potential biological removal level, and a finding as to whether the stock is a strategic stock requiring special management attention.

In August 1994 the Service circulated draft stock assessments for species under its jurisdiction, including northern right whales. With regard to the North Pacific right whale population, the assessment noted that some cited estimates ranged from 100 to 200 animals but that a reliable population estimate is currently not available. It therefore noted that the potential biological removal level could not be calculated. Concerning the western North Atlantic population, the assessment concluded that the population size was about 325 to 350 animals with a minimum population estimate of 295, the potential biological removal level was zero, and the stock should be classified as a strategic stock.

On 1 December 1994 the Commission provided comments to the Service on stock assessments for marine mammals in the Pacific Basin. Concerning northern right whales, the Commission noted that, while a reliable estimate for population size is not available, the extremely low number of confirmed sighting (*e.g.*, 29 sightings for the eastern North Pacific this century) clearly justifies establishing the potential biological removal level at zero. With regard to the North Atlantic population, the Commission provided comments as part of its 12 December 1994 comments on assessments for the Atlantic and Gulf of Mexico. For this population it noted that additional information should be provided on the extent of past whaling activity and current mortality levels due to ship collisions and entanglement in fishing gear. The Commission also noted that the population estimate of 325 to 350 may be high given the degree of confidence noted in the report for the minimum population estimate of 295. Finally, the Commission noted that, if there are uncertainties in the size, range, and productivity of the population or the threats to animals or their critical habitats, such uncertainties should be identified in the assessment.

Southeastern U.S. Right Whale Recovery Plan Implementation Team

As discussed in the Commission's previous annual report, the National Marine Fisheries Service convened an interagency meeting on 26 August 1993 to discuss actions needed to protect northern right whales using the calving ground off the coasts of Florida and Georgia. During the meeting, the Southeastern U.S. Right Whale Recovery Plan Implementation Team was formed to coordinate a cooperative approach for implementing protective measures during the whales' winter residence period. A representative of the Georgia Department of Natural Resources agreed to chair the team and its other members include representatives of the Service, the Army Corps of Engi-

neers, the Coast Guard, the Navy (*i.e.*, the Jacksonville Naval Air Station in Florida and the Kings Bay Submarine Base in Georgia), the Environmental Protection Agency, the Canaveral Port Authority, the Florida Department of Environmental Protection, the Georgia Ports Authority, the Glynn County (Georgia) Commission, the Port of Fernandina Beach, Florida, and the University of Georgia.

To focus its work, the team formed five subcommittees to oversee matters on (1) developing an "early warning system" to alert vessels to the location of right whales, (2) funding and carrying out aerial surveys, (3) public education and awareness, (4) research, and (5) relocating ocean dredge spoil disposal sites. A second team meeting was held on 14 December 1993 to review subcommittee activities and recommendations. Based on the discussions, team representatives undertook a series of activities during the December 1993 to March 1994 winter whale season.

As a cornerstone of the program, agencies represented on the team supported daily aerial surveys, weather permitting, to monitor the location of whales. Sighting reports were passed along promptly to port authorities, harbor pilots, dredge spoil disposal barges, naval installations at Mayport, Florida, and Kings Bay, Georgia, the Coast Guard, and directly to large ships seen approaching whales. In addition to sighting reports from daily survey flights, reports also were received and passed along from weekly right whale research surveys and unscheduled flights flown by the Georgia Department of Natural Resources and the Florida Department of Environmental Protection to verify public sighting reports. On six occasions, vessels seen approaching a whale were contacted directly by aerial observers, prompting immediate evasive action to avoid a collision.

Participating agencies and groups also prepared a newsletter, fliers, brochures, posters, press releases, and radio broadcasts to alert vessel operators and the public about the presence of right whales along the coasts of Florida and Georgia. The cooperative efforts greatly improved awareness about right whales. In 1994 there was one report of a right whale being struck by ships off Florida and Georgia, that being the right whale calf severely injured in February and which, as noted above, is presumed to have died.

On 9 November 1994 the team met to prepare for the 1994-1995 whale season. It agreed that the early warning system should be continued and strengthened by, among other things, (a) holding a series of training seminars to educate mariners about right whales, (b) having port dispatchers announce whale advisories effective for a 24-hour period after a whale sighting to alert incoming and outgoing ships to recent sighting locations and the need for caution, and (c) developing a set of standard operating procedures for vessels to follow when in the vicinity of right whales.

Northeastern U.S. Right Whale and Humpback Whale Recovery Plan Implementation Team

On 19 August 1994 the National Marine Fisheries Service convened a meeting in Boston, Massachusetts, to establish a northeastern regional implementation team similar to the southeastern implementation team discussed above. Like the southeastern team, the purpose of the northeastern team was to provide a multiagency coordinated approach to large whale conservation in the New England area, to identify and rank funding priorities, and to guide agency commitments and responsibilities in conservation work. Because of similar problems shared by right whales and humpback whales off New England, the focus of the northeastern team was to include both species.

During the meeting the New England Right Whale and Humpback Whale Recovery Plan Implementation Team was formed. Its members include representatives of the Service, the Commission, the Army Corps of Engineers, the Coast Guard, the Environmental Protection Agency, the Stellwagen Bank National Marine Sanctuary, the New England Fisheries Management Council, the Canadian Department of Fisheries and Oceans, MASSPORT, the Massachusetts Water Resources Authority, the Boston Sewage Outfall Monitoring Task Force, the Massachusetts Coastal Zone Management Office, the Massachusetts Office of Non-Game and Endangered Species, the Center for Coastal Studies, the New England Aquarium, and the University of Rhode Island.

During the meeting it was agreed that priority attention should be on conservation needs for right whales. To help focus initial work, three subcommittees were formed on research needs, reducing ship strikes and entanglement in fishing gear, and habitat protection and monitoring. A second meeting of the full team was tentatively set for October 1994 and, prior to that meeting, the subcommittees were to have met to identify recommended actions in their areas. At the end of 1994, however, neither the subcommittees nor the full team had met and no specific actions or schedule of work had been identified for 1995.

Right Whale Research

Early in the 1980s the Marine Mammal Commission supported a number of studies on right whales and prepared a recommended plan to guide right whale research and management work. Right whale research received a major boost in 1986 when Congress appropriated $500,000 for right whale studies by a consortium of non-governmental research organizations (the University of Rhode Island, the New England Aquarium, the Center for Coastal Studies, and the Woods Hole Oceanographic Institution). This was the first measure of support for an intensive, long-term right whale research program in the western North Atlantic. From 1987 through 1993 the consortium's work was continued by directed Congressional appropriations ranging from $200,000 to $250,000 per year passed through the National Marine Fisheries Service. In addition, the Minerals Management Service, the Army Corps of Engineers, the Navy, the National Science Foundation, and the Marine Mammal Commission periodically supplemented Congressional funding with support for various research projects.

The primary objective of the consortium's research has been to determine and monitor key population parameters and trends for the northwest Atlantic right whale population. To do so, the consortium developed a computer database and a right whale photo-identification catalogue based on annual aerial and shipboard surveys at each of the five known seasonal habitats in the western North Atlantic (*i.e.*, the Florida-Georgia coast, Cape Cod Bay, the Great South Channel, the Bay of Fundy, and Browns Bank off the southern tip of Nova Scotia). The photo-identification catalogue, which now contains records on some 325 individual whales (some of which have since died), appears to encompass almost the entire northwest Atlantic right whale population and provides a good basis for assessing population size, survivorship rates, movement patterns, and reproductive rates. To supplement the aerial and shipboard surveys, studies have been done to necropsy animals found dead, radio-tag and track individuals, evaluate feeding behavior and prey composition, document contaminant levels, assess relationships among individuals and subgroups through genetic analyses, and compile historic whaling records.

For 1994 the National Marine Fisheries Service again provided about $200,000 for right whale studies. Instead of passing funding through the consortium, however, the Service contracted directly with the New England Aquarium, the University of Rhode Island, and others. Major efforts in 1994 focused on maintaining the right whale photo-identification catalogue and computer database and developing a computer model to assess hydrodynamic effects that might influence the likelihood of collisions between large ships and whales.

In October 1994 the Service also took two steps to guide future right whale research. First, it contracted with the New England Aquarium for right whale studies in 1995 in five general areas: evaluating data on population vital rates and parameters; radio-tagging work to help identify presently unidentified summer and winter habitat; developing a plan to reduce ship strikes; population monitoring and habitat-use studies in the Gulf of Maine; and population monitoring and habitat-use studies on the calving ground off Georgia and Florida. The contract amount was $157,000.

Second, the National Marine Fisheries Service convened a scientific panel to review the results of right whale research over the past 15 years and to identify future research priorities. The panel, which included a representative of the Marine Mammal Commission, met 3-7 October 1994 in Woods Hole, Massachusetts. Although the panel's report was not available at the end of 1994, preliminary findings were presented at the Commission's annual meeting 16-18 November in Falmouth, Massachusetts.

Among other things, the panel is expected to recommend work to maintain the right whale photo-identification catalogue, continue annual surveys in known high-use habitats, continue necropsies on right whale carcasses and strengthen the carcass reporting network, undertake demographic analyses and modeling, study right whale habitat-use patterns and ship traffic in the winter calving ground and northern feeding areas, use satellite tagging to locate other important right whale habitats, expand biopsy sampling efforts, undertake genetic analyses, and monitor conflicts with fishing gear. The panel report will be used by the Service to direct work in 1995 under the above-noted contract.

Right Whale Litigation

On 7 June 1994 an individual filed a complaint in the U.S. District Court for the District of Massachusetts alleging violations by the Coast Guard of the Endangered Species Act, the Marine Mammal Protection Act, and the Whaling Convention Act (*Strahan* v. *Linnon*). The plaintiff seeks to prevent the Coast Guard from operating its vessels, and from issuing permits allowing others to operate vessels, in a manner that results in killing, injuring, or disturbing northern right whales or any of five other Federally protected whale species.

In a 10 November motion seeking a preliminary injunction, the plaintiff states that the taking of right, humpback, fin, sei, blue, and minke whales incidental to vessel operation is prohibited by Federal wildlife laws and contends that the Coast Guard, by operating its vessels in the manner it does and by allowing other vessels to engage in such activities, has violated these statutes. The plaintiff alleges that as many as one-half of all northern right whale deaths are caused directly by Coast Guard operations or by vessels subject to Coast Guard inspection and documentation requirements.

The plaintiff notes that, although collisions between right whales and Coast Guard vessels are responsible for at least two right whale deaths in the past four years, the Coast Guard has not obtained incidental take authority under either the Endangered Species Act or the Marine Mammal Protection Act. The plaintiff further contends that the Coast Guard has violated section 7 of the Endangered Species Act by failing to consult with the National Marine Fisheries Service to determine that its programs for conducting vessel inspections and issuing documentation to vessel operators are not likely to jeopardize the northern right whale or any other endangered species. In particular, the plaintiff notes that commercial whale-watching operators are allowed to operate in an "unregulated and hazardous" manner in close proximity to whales in the coastal waters of the United States, including waters designated as right whale critical habitat.

The plaintiff has asked the court to issue an order to (1) restrain the Coast Guard from allowing its vessels to approach or operate within 500 yards of any northern right whale or within 100 yards of the other whale species; (2) enforce the applicable wildlife statutes by preventing any other vessel from approaching within 500 yards of a northern right whale or within 100 yards of the other whale species; and (3) prohibit Coast Guard vessels from operating in waters designated as right whale critical habitat without first monitoring the area for the presence of whales and then to operate only at safe speeds. A hearing on the matter is scheduled for 8 February 1995.

Humpback Whale (*Megaptera novaeangliae*)

Humpback whales occur seasonally in both open ocean and coastal areas in all the world's oceans. They typically migrate between winter calving grounds in tropical latitudes and non-winter feeding areas in temperate and polar latitudes. Humpback whales feed mainly on small schooling fish (*e.g.*, capelin, mackerel, and anchovy) and krill. Because of the reversal of seasons in the Northern and Southern Hemispheres, there is probably little if any interaction between humpback whale stocks north and south of the equator. Some 13 stocks have been identified worldwide, three of which occur seasonally in U.S. waters. These are the central and eastern North Pacific and western North Atlantic stocks.

All stocks of humpback whales were severely depleted by commercial whaling. In response, the

International Whaling Commission adopted a series of measures between the mid-1950s and the early 1960s banning the hunting of humpback whales in different areas. By 1966 all stocks were fully protected. Humpback whales were first listed as endangered under the U.S. Endangered Species Preservation Act in 1970, a designation carried forward under the Endangered Species Act of 1973. The species also is listed on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, which prohibits international trade in all humpback whale parts for commercial purposes.

Under this protection, many stocks have begun to show signs of recovery. However, population sizes and recovery rates may be limited by human-related impacts associated with noise disturbance, collisions with vessels, entanglement in fishing gear, oil spills, offshore oil and gas development, discharge from sewage outfalls, whale-watching activities, coastal development, and depletion of prey resources. As noted below, for example, humpback whales which winter in the Hawaiian Islands may be affected by low-frequency sounds used in the Acoustic Thermometry of Ocean Climate Program.

North Pacific Humpback Whales

At least two stocks of humpback whales occur seasonally in U.S. waters in the Pacific: the central North Pacific stock, with winter calving grounds in the Hawaiian Islands and summer feeding grounds off Alaska and Canada, and the eastern North Pacific stock, with winter calving grounds off mainland Mexico and the Revillagigedo Islands and summer feeding grounds along the coasts of California, Oregon, and Washington. Members of a third stock — the western North Pacific stock — also may use feeding grounds off Alaska in summer. The winter calving grounds for this stock are around the Ryukyu, Bonin, and Mariana Islands in the Philippine Sea off Southeast Asia.

The movement of animals between the Hawaiian calving grounds and calving grounds on the eastern and western sides of the North Pacific appears to be limited. Greater intermixing apparently occurs in summer on the northern feeding grounds. While the extent of overlap is uncertain, it appears reasonable to consider the three groups as relatively discrete stocks or management units.

In recent years there have been reports of increasing numbers of humpback whales off the west coast of the United States. In 1991 and 1992 the National Marine Fisheries Service supported a series of aerial and shipboard surveys and photo-identification studies off California, Oregon, and Washington. Based on data from the photo-identification work, researchers estimated that about 600 humpback whales occurred in waters off the three states. They also concluded that the area supported a single intermixing feeding aggregation of humpback whales with very little interchange of animals between this area and other feeding areas farther north.

Humpback Whales in Hawaii — As noted above, waters around the main Hawaiian Islands are winter breeding and calving grounds for the central North Pacific stock of humpback whales. A number of research groups study humpback whales in Hawaii, and there is concern that duplicative work could result in unnecessary disturbance of the whales.

In 1992 and 1993 the Commission provided funds in partial support of meetings of Hawaiian humpback whale researchers to review and coordinate planned research, identify future research plans, identify possibly harmful research practices and ways to avoid harmful effects, and identify and avoid unnecessarily duplicative studies.

During the meetings, participants presented recent research findings, described future plans, and considered ways to improve cooperation and data-sharing and to record and report data on close approaches to whales. At the 1993 meeting there was general agreement that it would be useful to hold similar workshops annually. It also was recommended that researchers participate in a two- or three-day workshop, including time on the water comparing techniques, to build a common understanding of the best ways to approach whales without disturbing them and to help researchers and managers standardize data collection procedures.

As of the end of 1994 the Service was planning another meeting for early in 1995. The meeting,

which is expected to include time in the field, will again be open to all humpback whale research groups in Hawaii. The Commission is providing funds to the Service to help defray costs for the 1995 meeting.

On a related matter, by letter of 28 February 1994 the National Marine Mammal Laboratory advised researchers conducting photo-identification and other studies of North Pacific humpback whales that, due to lack of funding, the lab no longer would be able to support the North Pacific humpback whale photo-identification collection. The collection, to which 30 researchers or research groups have voluntarily contributed photographs, contains more than 12,000 photographs of whales dating from as early as 1966.

Several researchers involved in the program advised the Commission of the lab's plans to discontinue support for the collection. By letter of 16 May 1994 to the National Marine Fisheries Service, the Commission questioned whether simply terminating the program was the best way to realize the necessary cost savings. The Commission pointed out that well-developed and well-maintained collections of photographs of individually recognizable whales can be used to estimate and monitor such things as population size, calving intervals, and age-specific survival and reproductive rates. Therefore, the Commission suggested that, before terminating the program, the Service consult with investigators who have contributed to the collection, and those who maintain photo-identification collections elsewhere, to determine the preferred way to maintain and periodically analyze data from the collection. The Commission suggested that it might be preferable to transfer the collection to a non-governmental organization.

In a 9 September 1994 letter to researchers who have contributed photographs to the collection, the National Marine Mammal Laboratory indicated that it was exploring the possibility of transferring the collection to an academic institution. At the end of 1994 the Service had not yet made a final decision regarding the collection.

Also, with respect to Hawaii, the Department of Defense provided funding in 1993 for a follow-up study to the Heard Island Feasibility Test — an experiment that demonstrated the feasibility of using underwater travel times of low-frequency sounds to detect changes in ocean temperature caused by global warming or long-term climate change. As part of the follow-up study, the investigators have proposed installing sound generators off the island of Kauai to produce low-frequency sounds to be received at distant sites. The effect the sounds will have, if any, on humpback whales and other marine organisms is not known. Therefore, marine mammal studies have been added to the follow-up study as part of the proof-of-concept study. These and related matters are described in Chapter XII.

Glacier Bay National Park — During summer, a portion of the central North Pacific stock of humpback whales feeds in coastal waters of southeastern Alaska, including Glacier Bay. The bay lies entirely within Glacier Bay National Park and Preserve, administered by the National Park Service. The bay's glaciers, wildlife, and spectacular scenery make it a popular destination for cruise ships and other tourism-based vessels. Late in the 1970s the number of humpback whales in Glacier Bay declined significantly. It was thought that noise and disturbance from increasing numbers of cruise ships and other vessel traffic may have caused whales to leave or avoid the bay.

The National Park Service, with assistance from the Marine Mammal Commission, quickly took steps to review the problem. Subsequently, in consultation with the National Marine Fisheries Service, the National Park Service limited vessel entries into the bay and instituted a series of research and monitoring studies. In 1985 the National Park Service adopted regulations that established a permit system for vessel entries, prohibited fishing for certain humpback whale prey species in the bay, and designated certain areas for special vessel-operating procedures to minimize disturbance to whales.

In developing its regulations, the National Park Service consulted with the National Marine Fisheries Service pursuant to section 7 of the Endangered Species Act. Results of the consultation were provided in a biological opinion prepared by the Fisheries Service in June 1983. It recommended that vessel traffic not be allowed to increase unless the number of whales using Glacier Bay remained at or above the 1982 level of 22 whales. Recommendations with

regard to research and monitoring also were set forth in the opinion.

The National Park Service incorporated these recommendations into its regulations, which have remained in effect since 1985. In 1986 and 1987 the number of whales using the bay during a standardized baseline observation period was 26 and 28, respectively, which exceeded the 1982 level. At the urging of cruise ship companies, the National Park Service increased the allowed number of cruise ship entries for the 1987 and 1988 seasons to 107 per season. Between 1988 and 1991 the number of whales using the bay declined to between 16 and 22 whales per year. Reasons for the apparent decline were not clear and may have been related to additional vessel traffic, changes in prey distribution, or other factors.

Responding to continued urging by the cruise ship industry to increase the number of cruise ships allowed in the bay, the National Park Service initiated steps in 1991 to evaluate alternative approaches for managing vessel traffic and numbers in Glacier Bay. In response to a request for comments on the development of a vessel management plan, the Commission wrote to the National Park Service on 18 July 1991, recommending that if an increase in vessel entries above current limits was likely to be authorized, the Park Service consult informally with the National Marine Fisheries Service pursuant to section 7 of the Endangered Species Act before circulating a draft plan for public review. A preliminary draft plan was subsequently prepared by the Park Service and provided to the Fisheries Service, which reviewed the document and returned a biological opinion on 19 February 1993.

In its biological opinion the National Marine Fisheries Service noted that, while it was difficult to assess the significance of the decline in the number of whales in 1988-1991, it was a cause for concern. It also noted that because systematic monitoring of whale prey and noise produced by vessels in the bay had not been done, it was not possible to determine the cause of this apparent decline. It added, however, that because the decline occurred at the same time vessel traffic increased, it could not rule out the possibility that some whales may avoid the area because of vessel traffic. The opinion therefore urged that the National Park Service take a conservative approach in all management actions and recommended further studies be undertaken concerning humpback whale prey and habitat-use patterns in Glacier Bay and surrounding areas.

In 1993 and 1994 the National Park Service continued to limit cruise ship entries to 107. However, it is the Commission's understanding that the Service was considering a relaxation of the vessel entry regulations to allow a substantial increase in the number of cruise ships and other vessels entering the bay. At the end of 1994 the Service had not yet taken action to increase the vessel-entry level.

North Atlantic Humpback Whales

At least two stocks of humpback whales are thought to exist in the North Atlantic Ocean — an eastern and a western stock. The western stock, estimated to number about 5,500 animals, winters in coastal waters of countries bordering the eastern Caribbean Sea. Its known summer feeding grounds include the Gulf of Maine, the Bay of Fundy, the Gulf of St. Lawrence, and waters off Newfoundland, Labrador, southwestern Greenland, and Iceland.

In the past five years, sighting and stranding records indicate that some humpback whales, probably mostly juveniles, also have begun using nearshore waters off the mid-Atlantic and southeastern states. The sightings, principally between January and March, include feeding whales and suggest that at least some juveniles in the western North Atlantic stock do not migrate to the West Indies in winter but instead remain in temperate coastal waters to feed. Between 1985 and 1992, 38 humpback whale strandings were reported in this region. Of these, 20 were examined to determine the cause of death; six are believed to have died as the result of ship-strikes and five had injuries suggesting entanglement in fishing gear.

There is no population estimate for the eastern North Atlantic stock of humpback whales and the location of its winter calving grounds is uncertain. Based on historical whaling records, it may winter off the northwest coast of Africa and the Cape Verde

Islands. Its summer feeding ground appears to be west and north of Norway in the Norwegian Sea.

Project YONAH — In 1992 scientists from seven countries (Canada, Denmark, the Dominican Republic, Iceland, Norway, the United Kingdom, and the United States) initiated a cooperative three-year scientific research project to improve understanding of the biology and ecology of humpback whales in the North Atlantic. The principal focus of this project (called Years of the North Atlantic Humpback Whale, or Project YONAH) is the collection and analysis of information on abundance, population structure, vital rates, migratory movement, and breeding behavior.

The first two years of the project — 1992 and 1993 — were dedicated principally to field work. Photographs for identifying individual whales, biopsy samples, and other data were collected in both years from the West Indies and all five known summer feeding grounds. The field work has been very successful. About 5,000 fluke photographs, suitable for identification of individuals, and about 2,600 biopsy samples for sex determination and genetic analysis have been collected from whales in the six areas.

The photographs and biopsy samples from waters off Norway constitute the first time that substantial numbers of identification photos and samples have been collected in that area. A preliminary comparison of photographs taken from that area in 1992 with photographs taken from the West Indies produced no matches, lending support to the hypothesis that the two groups of whales are from separate stocks. Genetic analyses of biopsy samples from both areas should clarify this point.

The primary field work for the project is now complete, and efforts in 1994 were devoted principally to data analysis. Publication of project findings and conclusions will not occur until data analyses are completed. As indicated in previous annual reports, the Commission provided support to the program in 1991 and 1993 to assist in project administration.

Draft Stock Assessment Reports

As noted in Chapter V, the Commission reviewed draft marine mammal stock assessment reports prepared by the National Marine Fisheries Service and the Fish and Wildlife Service in partial fulfillment of the provisions of the 1994 amendments to the Marine Mammal Protection Act. In letters to the National Marine Fisheries Service dated 1 and 12 December 1994 the Commission provided comments on draft assessments of three humpback whale stocks.

With regard to the western North Atlantic stock, the Commission indicated that the assessment should be revised and expanded to provide better justified estimates of population size and productivity and more thorough assessments of human-related threats to both the population and its habitats.

With regard to the central North Pacific stock, the Commission noted that the draft assessment did not, but should, provide information on the demography, dynamics, and threats to the whales present in Hawaiian waters in winter. The Commission also noted that, while the draft report indicated that there is little or no human-related mortality or injury to humpback whales in the North Pacific, data obtained through the Service's fishery logbook and observer program indicate that humpback whales may be taken incidentally in some types of gillnet, longline, purse seine, and groundfish trawl fisheries.

The draft assessment of the eastern North Pacific (California/Mexico) humpback whale population provided a reasonably complete summary and evaluation of available information.

National Marine Sanctuaries

National marine sanctuaries are administered by the Sanctuaries and Reserves Division of the National Oceanic and Atmospheric Administration's National Ocean Service under Title III of the Marine Protection, Research, and Sanctuaries Act. The purposes of designated sanctuaries are to protect and manage areas of special importance for their ecological, historical, recreational, and aesthetic values. On 4 November 1992 the President signed into law legislation desig-

nating the Hawaiian Islands Humpback Whale National Marine Sanctuary and the Stellwagen Bank National Marine Sanctuary. While designation of these sanctuaries occurred at the same time, the pace at which implementing measures have been enacted has differed.

The Stellwagen Bank area had been under consideration for sanctuary designation since 1983. The sanctuary includes a 20-mile long submerged sand bank stretching between Cape Cod and Cape Ann, Massachusetts, that, among other things, is an important feeding area for humpback whales. In August 1993 the Sanctuaries and Reserves Division circulated its Final Environmental Impact Statement for the Stellwagen Bank sanctuary, setting forth the provisions for its administration, and on 19 October 1993 it published final regulations for the sanctuary. The Commission's advice regarding the sanctuary (*e.g.*, comments in support of the proposed designation and comments on the draft environmental impact statement) is described in previous annual reports.

A representative of Stellwagen Bank sanctuary is serving on the New England Right Whale and Humpback Whale Recovery Plan Implementation Team, established by the National Marine Fisheries Service to help implement regional protection measures for both species. Although primary attention is to be given to right whale protection, actions to address ship strikes, entanglement in fishing gear, and other management issues will also benefit humpback whales. The staff of the Stellwagen Bank sanctuary has indicated a strong desire to assist in these efforts.

The Hawaiian Islands sanctuary includes the area within the 100-fathom isobath adjoining Lanai, Maui, and Molokai, including the Penguin Banks. Not included are waters within three nautical miles of Kahoolawe Island. The area within the designated sanctuary is a high-use area for breeding, calving, and nursing humpback whales. In March 1993, as a precursor to the preparation of a draft environmental impact statement, the Sanctuaries and Reserves Division distributed an information package for review. On 14 June 1993 the Commission provided comments to the Division noting, among other things, the importance of measures already taken by the State of Hawaii to protect humpback whales, including limiting areas where thrill craft (*e.g.*, jet skis and parasail boats) can operate. In this regard, the Commission noted that, although specific measures exist in the sanctuary management plan to protect humpback whales, the measures may need to be modified as human activity patterns and whale habitat-use patterns change. Therefore, the Commission recommended that the proposed sanctuary management plan include the option of establishing additional protective measures at a future time in cooperation with the National Marine Fisheries Service and appropriate State agencies. The Commission also suggested that additional ecosystems, such as those used intensively by Hawaiian monk seals and seabirds, be considered for inclusion within the sanctuary boundaries.

In 1994 Commission staff met several times with personnel from the Sanctuaries and Reserves Division and the National Marine Fisheries Service to discuss variables that should be considered in designing the sanctuary's management program. At the end of 1994 the Division was completing the draft environmental impact statement and sanctuary management plan. These are expected to be circulated for review and comment early in 1995.

In 1995 the Commission will follow developing issues regarding vessel traffic in Glacier Bay, continue to support Hawaiian humpback whale research coordination meetings, assist in implementing and organizing the Hawaiian humpback whale sanctuary, review the results of Project YONAH, and otherwise provide advice regarding the recovery of North Pacific and North Atlantic humpback whale stocks.

Bowhead Whale (*Balaena mysticetus*)

Bowhead whales occur only in the northern hemisphere and are circumpolar in distribution. Historically there are believed to have been at least four separate stocks. The largest surviving stock is the Bering-Chukchi-Beaufort Seas stock. Most of this stock migrates from wintering areas in the northern Bering Sea, through the Chukchi Sea in spring, to the Beaufort and Chukchi Seas where they spend much of the summer before returning to the Bering Sea in autumn.

Bowhead whales were severely depleted by intense commercial whaling in the late 19th and early 20th centuries. Although all stocks were subject to hunting, the period of exploitation and extent of depletion differed for each. In the western Arctic, the population off Alaska, eastern Russia, and northwestern Canada was heavily exploited from 1848 to 1915.

Bowhead whales are listed as endangered under the Endangered Species Act of 1973 and are considered depleted under the Marine Mammal Protection Act. All stocks of bowhead whales are classified as protected stocks by the International Whaling Commission (IWC).

Current Population Status

In 1991 the IWC's Scientific Committee conducted a comprehensive assessment of available information on the Bering-Chukchi-Beaufort Seas bowhead whale stock. The Committee agreed that in 1988 (the most recent year for which complete census data were then available) the stock numbered between 6,400 and 9,200, with the most likely estimate being 7,500. The pre-exploitation (1848) population was estimated at 12,400 to 18,200 whales. The Committee concluded that Native subsistence take by itself should not prevent the recovery of the stock. However, other factors (*e.g.*, environmental change, pollution, and noise disturbance from activities related to offshore oil and gas), combined with subsistence take, could have cumulative effects that might prevent the stock's recovery.

Between 1988 and 1992 poor weather conditions prevented collection of reliable data for population estimation. However, in 1993 the ice-based visual census off Point Barrow, Alaska, resulted in more whale and calf sightings than in any previous year. Also, acoustic census work, which has complemented the visual counts since 1984, was more successful in 1993 than any previous year. In 1994 the Committee used these data to conduct another comprehensive population assessment. After reviewing the 1993 data and various data analysis and estimation procedures, as well as various life history parameters, the Committee agreed that the best available estimate of the current population size is 7,992 individuals with a 95 percent confidence interval between 6,900 and 9,200.

Eskimo Whaling

Bowhead whales are hunted by Alaska Natives for subsistence and cultural purposes. Allowable catch levels are established by the IWC, based on advice from its Scientific Committee, and are implemented by the National Marine Fisheries Service and the Alaska Eskimo Whaling Commission.

In 1982 the International Whaling Commission adopted a new paragraph to its Schedule of Regulations setting forth guidelines for establishing catch limits for aboriginal subsistence whaling. The new paragraph formally recognized the distinction between commercial and aboriginal subsistence whaling. It also codified the IWC's past practice of attempting to strike a balance between the subsistence, cultural, and nutritional needs of aboriginal people and the need to protect affected whale stocks.

In response to the guidelines, the U.S. Department of the Interior developed a quantitative procedure for determining the subsistence and cultural needs of Alaska Eskimos. Based on data available in 1983, the subsistence and cultural need for bowhead whales was established at 26 animals landed per year. Using updated information from nine Alaska Native whaling villages, this estimate was revised in 1988 to 41 whales landed per year.

The United States requested and received from the IWC an annual quota of 41 whales landed and a maximum of 47 struck for each of the years 1989, 1990, and 1991 on behalf of its Alaska Natives. In 1991 the United States requested a quota of 54 strikes per year for the years 1992, 1993, and 1994 with no more than 41 whales to be landed in any year. In response, the IWC adopted a three-year block quota allowing a total of 141 bowhead whales to be struck during 1992-1994. In addition, the IWC adopted a provision allowing 13 unused strikes from the 1989 through 1991 quota to be carried forward and added to the new quota. Thus, Alaska Native whalers were authorized up to 154 strikes during 1992-1994. During any single year, however, the number of strikes could not exceed 54 and the number of whales landed could not exceed 41. Recent catch and strike totals are shown in Table 6.

Table 6. Quotas and number of bowhead whales taken by Alaska Eskimos, 1973-1994[1]

Year	IWC Quotas[2] Landed/ Struck	Number Taken Landed	Struck but not Landed	Total Struck	% Struck and Landed
1973	--	39	20	59	66
1974	--	20	34	55	36
1975	--	15	28	43	35
1976	--	48	43	91	53
1977	--	29	82	111	26
1978	14/20	12	6	18	67
1979	18/27	12	15	27	44
1980	18/26	16	28	44	36
1981	17/27	17	11	28	61
1982	17/27	8	11	19	42
1983	17/27	9	9	18	50
1984[3]	—/43	12	13	25	48
1985[3]	—/26	11	6	17	65
1986[3]	—/26	20	8	28	71
1987[3]	—/32	22	9	31	71
1988[3]	—/35	23	6	29	79
1989	41/44	18	8	26	69
1990	41/47	30	14	44	68
1991	41/44	28	19	47	60
1992	41/54	38	12	50	76
1993	41/54	41	11	52	79
1994	41/52	34	12	46	74

1 Cited quotas established by the International Whaling Commission; data on numbers of whales landed, struck but not landed, and total struck are from Suydam, R.S., R.P. Angliss, J.C. George, S.R. Braund, and D.P DeMaster. 1994. Revised data on the subsistence harvest of bowhead whales (*Balaena mysticetus*) by Alaska eskimos, 1973-1993. Working paper SC/46/AS10 of the 1994 meeting of the International Whaling Commission Scientific Committee.

2 Whaling is to cease whenever the number of whales landed or the number of strikes made reaches the specified number, whichever comes first.

3 From 1984 to 1988 quotas were set for strikes only.

At its 1994 meeting, the IWC amended the Schedule of Regulations to authorize bowhead whale takes for subsistence and cultural purposes for the years 1995 to 1998. The amendment permits the landing of no more than 204 bowhead whales from the Bering-Chukchi-Beaufort Seas population during the four-year period. The Commission based this total on a need of 51 animals per year for Alaska Natives in ten whaling villages, up from 41 landed per year for 1992 to 1994. The quota includes a decreasing number of strikes permitted each year: 68 strikes in 1995, 67 in 1996, 66 in 1997, and 65 in 1998. In an effort to continue improving the efficiency of the hunt, the target efficiency rate (total landed as a function of total struck) will be raised each year: 75, 76, 77, and 78 percent for the years 1995, 1996, 1997, and 1998, respectively. The Commission allowed any unused portion of the strike quota to be carried forward for use in subsequent years, provided that no more than ten strikes are added to the strike quota for any one year.

Subsistence Whaling in Canada

In August 1991 the Canadian Minister of Fisheries and Oceans approved a license to the Inuvialuit community of Aklavik to kill one or strike two bowhead whales. The Inuvialuit subsequently struck and killed one animal. Canada, which withdrew from the IWC in 1982, authorized the bowhead whale take without requesting permission from the IWC.

Because of the potential implications of the Canadian hunt on the conservation of bowhead whales, the Marine Mammal Commission wrote the U.S. IWC Commissioner on 5 December 1991. It recommended that, notwithstanding the need for an investigation of the circumstances surrounding issuance of the Canadian license, action be taken to certify the Government of Canada under the Pelly Amendment to the Fishermen's Protective Act for diminishing the effectiveness of the IWC's conservation program. No action was taken in 1991 through 1994 to certify Canada for authorizing the whaling activities; however, there were numerous bilateral consultations between the United States and Canada related to this activity.

Although the Canadian Government issued a license authorizing the take of one bowhead whale in the community of Aklavik in 1993 and one in 1994 by Canadian Natives for subsistence purposes, no bowhead whales were taken in either year. However, with respect to the eastern Canadian Arctic bowhead whale stock, in fall 1994 a Canadian Native took one

bowhead whale from the depleted Davis Strait stock, counter to Canadian law. The Davis Strait and Hudson Bay stocks combined are estimated to contain only 450 individuals.

To date, the Canadian Government has taken no action to rejoin the IWC, and its intentions with regard to allowing future Native hunting of bowhead whales are unclear.

Draft Stock Assessment Report

As indicated in previous sections of this chapter, in 1994 the Commission reviewed draft marine mammal stock assessment reports prepared by the National Marine Fisheries Service and the Fish and Wildlife Service in partial fulfillment of the provisions of the 1994 amendments to the Marine Mammal Protection Act. The Commission provided comments on the draft assessment reports concerning Alaska stocks to the National Marine Fisheries Service on 1 December 1994. With regard to the bowhead whale, the Commission concurred with the Service that the stock should be designated as a strategic stock because it is listed as endangered under the Endangered Species Act. The Commission indicated, however, that the draft report did not appear to provide a complete assessment of all available information concerning estimates of the potential biological removal level. In this regard, the best available information on the rate of population growth apparently was not considered and it was not clear if the estimate of the population growth rate took into account the number of animals taken each year by Alaska Natives for subsistence.

The Commission also noted that if there is reason to believe that bowhead whales or their habitat could be affected adversely by offshore oil and gas or other activities, the Service, in consultation with the State of Alaska and appropriate Native organizations, should develop a recovery plan for bowhead whales.

Bowhead Whale Recovery Plan

With regard to the last point, the National Marine Fisheries Service has lead U.S. responsibility for coordinating actions necessary to ensure that human activities do not adversely affect bowhead whales or their habitat. Development of a recovery plan specifying needed research and management actions would help the Service meet its responsibilities. Therefore, in a 5 December 1991 letter to the U.S. IWC Commissioner, the Marine Mammal Commission recommended that the Service develop a recovery plan for bowhead whales. No action was taken to develop a plan, and, in a letter dated 10 March 1993, the Commission again recommended that the Service immediately develop and implement a recovery plan for bowhead whales.

On 14 May 1993 the Service responded to the Commission's recommendation, indicating that the Service concurred on the need for a recovery plan for bowhead whales. However, the Service indicated it would be preferable to defer plan development until 1994 when the IWC's bowhead whale population assessment would be completed. The Service noted that industrial activity in the western Beaufort Sea, as well as Native subsistence take, may have a role in limiting growth of the Bering-Chukchi-Beaufort Seas bowhead whale population. By the end of 1994 the Commission had heard nothing further from the Service regarding a bowhead whale recovery plan.

Proposed Chukchi Sea Oil and Gas Lease Sale

As discussed in Chapter X, the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, provided comments on two requests for information from the Minerals Management Service on proposed leasing of areas in the Chukchi Sea for oil and gas exploration and development. On 2 February 1994 the Service issued a call for information and notice of intent to prepare an environmental impact statement for proposed oil and gas lease sale number 148 in the Chukchi Sea. The Commission provided information to the Service in a letter dated 16 March 1994. In the second instance, the Minerals Management Service and the Russian Federation published in the 6 September 1994 *Federal Register* a request for comments regarding proposed joint oil and gas leases in the U.S. and Russian Chukchi Sea. The Commission commented to the Service in a letter dated 2 December 1994.

In both letters, the Commission indicated that, with respect to bowhead whales, before proceeding

with the proposed lease sale, the Minerals Management Service should identify and assess the possible cumulative effects of offshore oil and gas exploration and development, the take by indigenous people, and other possible sources of mortality, injury, and habitat degradation throughout the population's range. The Commission also commented that the Service should assess the possible effects on distribution and movement patterns and thus the availability of the species for taking by indigenous people for subsistence.

In 1995 the Marine Mammal Commission will continue to monitor matters related to bowhead whales and advise the National Marine Fisheries Service, the Minerals Management Service, and other involved agencies on further actions that may be necessary to protect and encourage the continued recovery of the Bering-Chukchi-Beaufort Seas bowhead whale population. The Commission will also work to facilitate the recovery and protection of all bowhead whale stocks.

Killer Whale (*Orcinus orca*)

Killer whales occur in all oceans of the world from polar to equatorial regions and in both coastal and oceanic habitats. In North America, killer whales are most common along the Pacific coast from Puget Sound, Washington, north to the Alaska coast of the Bering and Chukchi Seas. Killer whales are highly social and, at least in some populations, form long-term associations along maternal lines. The basic social unit is the "pod," comprising up to several dozen related animals.

Killer whales have been hunted commercially, but not in large numbers. Since the early 1960s they have been captured for public display in oceanaria and zoos. From 1962 until 1976 killer whales were taken for this purpose from the waters off the Pacific coast of North America, including Puget Sound. Since 1976 most animals taken for public display have been from waters off the coast of Iceland.

No population of killer whales is listed as threatened or endangered under the Endangered Species Act. However, their occurrence in small, highly social groups and their relatively low density make local groups of killer whales vulnerable to adverse impacts. Recent information, described below, indicates that killer whales affect and are affected by commercial fisheries and other human activities.

Effects of the *Exxon Valdez* Oil Spill

The 24 March 1989 grounding of the tanker *Exxon Valdez* on Bligh Reef in Alaska's Prince William Sound caused the largest oil spill in U.S. history (see previous annual reports for further discussion). Although long-term effects of the spill on marine mammal populations are still being assessed, one killer whale pod known to inhabit Prince William Sound has suffered a substantially higher-than-normal level of mortality since that time, possibly due to the oil spill. Immediately following the spill, the pod was seen in and near areas where oil was present. The animals left the sound shortly after the spill, possibly to avoid noise and other disturbances associated with clean-up activities.

The pod, which numbered 36 whales prior to the spill, lost 13 individuals in the 15 months following the spill. During that time, no births were observed in the pod. Since 1991, however, four calves have been born, and one animal disappeared and is presumed to have died. In 1993 the pod contained 26 whales. It is not clear whether the reduction in pod size was due to contact with the oil, to other causes including factors associated with the spill, or a combination of factors.

Interaction with Fisheries

Killer whales prey upon many species of marine mammals, including other whales, dolphins, seals, and sea lions, and numerous fish species, including salmon, halibut, and mackerel. In some areas killer whales affect commercial longline fishing operations by taking hooked fish, including black cod or sablefish, from lines and damaging fishing gear. As a result, some fishermen consider killer whales a costly impediment to fishing activities. For instance, in 1985 in Prince William Sound, Alaska, sablefish fishermen reported losses to killer whales of about 25 percent of their potential catch — almost 120,000

pounds of fish. Such interactions have been known to occur in the Bering Sea since the 1960s when Japanese longline fishermen first reported the taking of hooked fish by killer whales. Fishermen continue to report interactions in both the Bering Sea and Prince William Sound.

A variety of techniques has been tried to reduce or eliminate such interactions, but to date none has been successful. Fishermen have tried acoustic deterrents (*e.g.*, "bang pipes" and seal bombs) and modified procedures, such as operating vessels in teams alternately retrieving lines so that one crew can keep animals away while the other retrieves hooked fish. Fishermen have also tried shooting killer whales and using high-powered explosive charges to prevent the whales from taking caught fish. Studies in the mid-1980s indicated that several members of the pod that interacted most frequently with the sablefish longline fishery in Prince William Sound apparently had been killed by fishermen. This is the same pod that experienced unusually high mortality around the time of the *Exxon Valdez* oil spill. Recent observations suggest that additional whales may have been lost from this pod.

Killer Whale Stock Assessments

As discussed in Chapter II and elsewhere in this report, the 1994 amendments to the Marine Mammal Protection Act directed the Secretaries of Commerce and the Interior to prepare marine mammal stock assessments to serve as the scientific basis for a new regime governing the taking of marine mammals incidental to commercial fisheries. On 9 August 1994 the National Marine Fisheries Service distributed to the Marine Mammal Commission and others draft stock assessments for marine mammal populations under its jurisdiction, including killer whale stocks in the North Pacific, the western North Atlantic, and the Gulf of Mexico. The Commission reviewed the drafts and, by letters of 1 and 12 December 1994, provided comments to the Service.

With regard to the draft assessment of the killer whale population that inhabits the coastal waters of Alaska, Washington, and Oregon, the Commission commented that the assessment did not provide a thorough analysis of all potentially relevant information and contained conclusions that appeared inconsistent with one another. For example, the draft report indicated that killer whales found in Alaska, British Columbia, Washington, and Oregon constitute a single stock, but noted that individual killer whales identified in Alaska have also been observed in British Columbia, Puget Sound, and California. Therefore, it is not clear why the observation of one or more killer whales in California, previously observed in Alaska, did not provide a basis for considering the whales found in California to be part of the presumed Alaska, British Columbia, Washington, and Oregon stock.

With regard to the Hawaiian killer whale stock assessment, the Commission indicated that the draft report did not, but should include information that has been collected as part of the marine mammal component of the Acoustic Thermometry of Ocean Climate Program (described in Chapter XII). In addition, the Commission indicated that it was not clear whether consideration was given to information and uncertainties concerning possible human-caused mortality and injury in areas outside U.S. jurisdiction.

In commenting on the draft assessment on the northern Gulf of Mexico killer whale stock, the Commission indicated that the report did not provide sufficient information to determine whether all potentially relevant information had been identified and considered or whether the estimates of abundance and levels of human-caused mortality and injury were reasonable. With respect to the western North Atlantic killer whale population, the Commission indicated that the report did not but should note that, although the status of the stock is uncertain, there is no reason to believe that the distribution or abundance of killer whales in this region has been adversely affected by human activities in U.S. waters. The Commission suggested that the draft reports be revised and expanded to address and clarify these and other points.

Alaska Killer Whale Species Account

As noted above, there are many uncertainties concerning the status of killer whales and what can and should be done to minimize interactions with fisheries in Alaska. To clearly define these uncertainties and help assess what might be done to resolve

them, the Commission contracted in 1991 for the preparation of a species account, with research and management recommendations, on killer whales in Alaska. The report was published in 1994 (see Appendix C, Matkin and Saulitis 1994).

The Commission-sponsored killer whale report addresses research needs and priorities for investigating stock structure, pod size and composition, and habitat-use patterns. With respect to killer whales in Alaska, the report recommends, among other things, that efforts be made to determine abundance and delineate stocks; assess direct and indirect interactions between killer whales and commercial fisheries and identify actions needed to minimize the interactions; assess tissue contaminant levels; identify possible effects of vessel traffic, including whale-watching activities and the tour boat industry in Prince William Sound, southeast Alaska, and other popular tourist areas; assess impacts related to offshore oil and gas development and transportation and other industrial activities; and identify important killer whale habitats.

The Commission sent copies of the report to the National Marine Fisheries Service and interested and involved scientists. Copies of the report can be obtained from the Commission's office. This species report with research and management recommendations, like those previously prepared by Commission contractors and published by the Commission, will provide guidance for biologists, managers, and policymakers responsible for the study and conservation of Alaska's marine mammals.

Gray Whale (*Eschrichtius robustus*)

The gray whale occurs only in the North Pacific Ocean where it inhabits primarily coastal waters. There are two recognized population stocks: the western North Pacific (Korean) stock and the eastern North Pacific (California) stock. Each year virtually the entire eastern North Pacific stock migrates between principal summer feeding grounds in the Bering and Chukchi Seas and winter breeding grounds primarily in the nearshore waters and lagoons of Baja California, Mexico, and also in the Gulf of California.

The stock was severely depleted by commercial whalers in the mid-1800s and again in the early 1900s. The stock probably numbered no more than a few thousand individuals when it received protection from commercial whaling in 1946. In 1970 the species was listed as endangered under the Endangered Species Conservation Act, the predecessor to the Endangered Species Act of 1973.

Since commercial whaling for gray whales ended, the eastern North Pacific stock has grown rapidly. In 1978 the International Whaling Commission (IWC) reclassified the eastern North Pacific stock from a protected to a sustained management stock. The Commission also authorized the take of up to 179 gray whales annually for aboriginal subsistence uses.

The eastern North Pacific gray whale stock is estimated to number between 21,000 and 23,000 individuals and appears to be continuing to increase. At its 1991 meeting the IWC approved an annual quota of 169 whales for 1992, 1993, and 1994 to be taken from this stock by the Russian Federation on behalf of its Siberian Natives. However, no gray whales were taken in 1992 or 1993. At the end of 1994, information on take of gray whales by the Russian Federation in 1994 was not available.

Although the stock appears to be near pre-exploitation levels, its nearshore distribution and migratory pattern expose it to threats from habitat degradation and direct physical harm from human activities. Commercial fishing, offshore oil and gas exploration and development, whale-watching activities, recreational boating, operation of salt recovery plants in the breeding lagoons, and military activities pose threats to feeding, breeding, and migratory areas essential to the stock's survival.

Proposal to Remove the Eastern North Pacific Stock from the Endangered Species List

Section 4(c)(2) of the Endangered Species Act requires that a status review of listed species be done at least once every five years to determine whether any species should be removed from the list or reclassified. The National Marine Fisheries Service conducted a review of gray whales in 1990. It

concluded that the eastern Pacific stock had recovered to near its original population size and was neither in danger of extinction nor likely to become endangered within the foreseeable future. In light of these findings, the Northwest Indian Fisheries Commission petitioned the Service in March 1991 to remove the eastern North Pacific gray whale stock from the List of Endangered and Threatened Wildlife.

In November 1991 the National Marine Fisheries Service published a proposed rule in the *Federal Register* to remove the eastern North Pacific stock of gray whales from the endangered and threatened species list. The Service concluded that the stock had recovered to near or above its estimated pre-exploitation population size and was probably continuing to increase, that a number of studies carried out since 1984 indicate that impacts from oil and gas activities were not likely to jeopardize the continued existence of the stock, and that the stock was neither in danger of extinction nor likely to become endangered within the foreseeable future.

The Commission commented on the Service's proposed rule in a letter dated 15 May 1992. In the letter, the Commission concurred that significant progress toward recovery had been made but questioned whether delisting was justified and noted that there is no conclusive evidence that the eastern and western North Pacific gray whale stocks are discrete stocks that should be treated as separate entities for listing purposes. The Commission also indicated that while the eastern Pacific stock may be at or near pre-exploitation levels, the stock continues to face threats to important feeding areas, breeding areas, and migratory corridors. The Commission pointed out that the Service had provided little analysis or supporting documentation for its conclusion that the major gray whale calving lagoons in Baja California, Mexico, were sufficiently protected by Mexican law and that the feeding areas and migratory routes were sufficiently protected by U.S., Russian, and Canadian law.

Accordingly, the Commission recommended that the eastern North Pacific gray whale stock be downlisted to threatened rather than delisted unless the Service provided compelling support for its conclusions that (1) the western and eastern North Pacific stocks are independent, (2) habitat degradation does not present a significant threat to the stock's survival, and (3) programs necessary to assess and monitor habitat as well as population status throughout the species' range have been identified and will be done.

In a 30 December 1992 letter to the Commission, the Service explained the rationale for its conclusions and advised the Commission that it was recommending that the Department of the Interior remove the eastern North Pacific gray whale stock from the List of Endangered and Threatened Wildlife. On 7 January 1993 the Service published a notice of determination in the *Federal Register* that the eastern North Pacific stock of gray whales be removed from the endangered and threatened species list. The Service also determined that the western North Pacific gray whale stock has not recovered and should remain on the list as endangered.

In its *Federal Register* notice, the Service provided a comprehensive assessment of present and foreseeable threats to the species and its habitats. The assessment supported the Service's findings that, while certain human activities may pose threats to individuals and habitats of special importance, the eastern Pacific gray whale stock is neither in danger of extinction nor likely to become endangered within the foreseeable future. The Service also concluded that existing national and international regulatory mechanisms are adequate to protect both the stock and its essential habitats.

In its 7 January 1993 notice of determination, the Service recommended that the Department of the Interior amend the List of Endangered and Threatened Wildlife. In a *Federal Register* notice dated 16 June 1994 the Fish and Wildlife Service and the National Marine Fisheries Service jointly published a final rule amending the list by removing the eastern North Pacific gray whale and replacing it with the western North Pacific gray whale, which is still endangered.

Five-Year Research and Monitoring Plan

Section 4(g) of the Endangered Species Act requires that if a species under the Department's jurisdiction is delisted, the Secretary of Commerce must implement a system to monitor the status of the

species for at least five years. In anticipation of delisting, the National Marine Fisheries Service designated a group of Service biologists to draft a five-year plan of research and monitoring of the eastern North Pacific gray whale stock.

In November 1993 the National Marine Fisheries Service forwarded the draft five-year plan to the Commission for review. The plan set forth the following priority-ranked research tasks: (1) estimate abundance from biennial surveys during the southbound migration; (2) estimate calf production by counting calves during the northbound migration; (3) determine potential biases in methods used to estimate abundance and calf production; (4) estimate the number of animals killed for subsistence purposes by Russia for its Natives; (5) determine trends in pregnancy rates of animals taken in the subsistence harvest; (6) evaluate the current status of the stock; and (7) determine the degree to which human-caused effects (*e.g.*, chemical contaminants and marine noise) may compromise the viability of the stock and its habitat.

According to the plan, the Service would conduct cooperative studies with the Government of Mexico to monitor gray whale calving lagoons in Mexico. Further, the Service would monitor the impacts of U.S. whale-watching regulations on gray whales and encourage the Governments of Mexico and Canada to use similar standards for whale-watching activities in their waters.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the draft plan. In a 29 July 1994 letter to the Service, the Commission noted that the plan did not provide a clear description of what would be done during the next five years to ensure that delisting the eastern North Pacific gray whale stock was consistent with the intents and provisions of the Endangered Species Act. Among other things, the Commission noted that the draft plan (1) did not appear to consider means for assessing or mitigating human activities that may pose threats to habitats essential to the welfare of the stock and (2) assumed that decreases in population size can be detected by biennial counts during the southbound migration, but did not indicate the magnitude of change that could be detected by these counts over a five-year period. The Commission recommended that the plan be expanded and revised to (1) include as a matter of priority identification of ongoing, planned, and proposed human activities that could affect the principal calving and breeding lagoons in Baja California and summer feeding grounds in the Bering and Chukchi Seas and (2) provide clear indications of what will be done to determine the dependence of the eastern Pacific gray whale stock on specific feeding and breeding areas.

Potential Threats to Gray Whale Habitat

The Commission continues to question whether threats to essential gray whale habitats, particularly the calving/breeding lagoons in Baja California and the summer feeding grounds in high latitudes, have been identified and evaluated adequately. With respect to the Baja California lagoons, it is not clear what mechanisms are in place to assess and mitigate the possible impacts of future commercial development and other activities in and near the breeding lagoons. In this regard, the Commission provided funds in 1993 for a study of ongoing and planned development in and near San Ignacio Lagoon and Magdalena Bay and steps that have been taken to assess and avoid possible adverse impacts on both the whales and the lagoons. The contractor's draft report is under review, and the final report is expected to be completed early in 1995.

On a related matter, in a letter dated 27 July 1994 to the Administrator of the National Oceanic and Atmospheric Administration, the Commission provided a summary of ongoing and contemplated development activities in Laguna Ojo de Liebre, San Ignacio Lagoon, and Magdalena Bay, three major gray whale breeding lagoons. The Commission indicated that human activities in and near the lagoons could affect the whales directly and destroy habitats essential to their survival. The Commission recommended that the National Oceanic and Atmospheric Administration, in consultation with the Department of State, develop and implement a strategy for identifying and encouraging needed conservation measures. The Commission indicated that the strategy should include provisions for government-to-government communications through diplomatic and informal channels; assistance in carrying out environmental impact assessments for

both ongoing and planned activities that might adversely affect gray whales and their habitat in Mexico; and cooperative identification, planning, and funding of needed research, management, and monitoring programs.

In a letter to the Commission dated 16 September 1994, the Administrator of the National Oceanic and Atmospheric Administration indicated that, in response to the Commission's letter, he had directed the National Marine Fisheries Service to (1) continue discussions of gray whale issues at biennial meetings with Mexican officials and (2) consider including, as part of the gray whale five-year research and monitoring plan, a detailed plan to monitor development in and around the lagoons. In the letter, the Administrator also indicated that implementing such a plan required cooperation with the Mexican government and, until a cooperative program could be established, continued population assessment surveys of migrating gray whales was the best way to gather baseline information that might provide early insight to potential problems in the lagoons.

In a letter dated 16 December 1994 the Commission responded to the Administrator, emphasizing its continuing concerns about gray whale habitat degradation. In the letter, the Commission endorsed the Administrator's directives to the Service and indicated that (1) biennial counts of migrating gray whales, as specified in the five-year monitoring plan, will have relatively little power to detect changes in population size because only two counts will be done during the five-year period; (2) the serious, permanent threats to the stock relate to habitat degradation; and (3) the five-year plan would be strengthened by additional outside review. Therefore, the Commission recommended that, within the Service's gray whale program, highest possible priority should be given to identifying and determining how to prevent threats to breeding habitats. Further, the Commission asked that the Service forward the revision of the five-year research and monitoring plan to the Commission for review before it is finalized.

IWC Consideration of Threats to Gray Whale Habitat

At its May 1994 meeting, the International Whaling Commission's Scientific Committee reviewed the effects of tourism and other developments in gray whale critical habitats. The Committee took special note of the Mexico's recognition of the importance of gray whale breeding lagoons and its action to conserve these critical habitats. The Committee recommended that efforts should be made to protect and maintain the integrity of the lagoon habitats by (1) evaluating and considering the effects of lost habitats elsewhere, (2) careful planning of any development to accommodate the needs of developers and wildlife, and (3) implementing an ongoing research and monitoring program to allow detection and analysis of any changes in use of the lagoon by gray whales that could be associated with development, including tourism.

Draft Stock Assessment Reports

As discussed in other parts of this chapter and in Chapter V, the Commission reviewed draft marine mammal stock assessment reports prepared by the National Marine Fisheries Service and the Fish and Wildlife Service in response to the 1994 amendments to the Marine Mammal Protection Act. In comments forwarded to the National Marine Fisheries Service on 1 December 1994, the Commission indicated that the gray whale draft assessment provided a reasonably complete and concise summary of information concerning gray whales. The Commission noted, however, that the draft report did not describe activities that may be affecting gray whales and important gray whale calving/breeding areas in Baja California, Mexico, nor did it note the possibility of habitat degradation that could occur if a major oil spill were to occur in or near the principal summer feeding grounds in the Bering and Chukchi Seas. Also, the Commission pointed out that, to satisfy the expectations of section 117(d) of the Marine Mammal Protection Act, the final assessment should describe any uncertainties and the measures required to resolve these uncertainties concerning activities that may affect important gray whale habitats.

Proposed Leasing of Parts of the Chukchi Sea for Oil and Gas Exploration and Development

As discussed in Chapter X, the Marine Mammal Commission provided comments on two requests for information from the Minerals Management Service on proposed leasing of areas in the Chukchi Sea for oil and gas exploration and development. On 2 February 1994 the Service issued a call for information and notice of intent to prepare an environmental impact statement for proposed oil and gas lease sale number 148 in the Chukchi Sea. The Commission provided information to the Service in a letter dated 16 March 1994. In the second instance, the Minerals Management Service and the Russian Federation published in the 6 September 1994 *Federal Register* a request for comments regarding a proposed joint U.S.-Russian Federation oil and gas lease sale in the Chukchi Sea. The Commission commented to the Service in a letter dated 2 December 1994.

In both the 16 March 1994 and 2 December 1994 letters, the Commission indicated that, with respect to gray whales, the Minerals Management Service should identify and assess the possible cumulative effects of offshore oil and gas development throughout the species' range; the take for indigenous people by the Russian Federation; incidental take in fisheries; and whale-watching and other human activities that may affect the species and its habitat. Inasmuch as the viability of the eastern Pacific stock is dependent, to a large extent, on the summer feeding grounds in the Bering and Chukchi Seas, the Commission suggested that the Service identify the principal gray whale feeding grounds and prey species, indicate how drilling muds, oil spills, *etc.*, might affect the survival and productivity of important prey species, and assess the possibility of an oil spill occurring and affecting prey availability in potentially important feeding areas.

In addition, the Commission transmitted with the 2 December 1994 letter a copy of its aforementioned comments on the National Marine Fisheries Service's five-year gray whale research and monitoring plan. In the letter, the Commission recommended that the Minerals Management Service consult with the National Marine Fisheries Service to determine what the Minerals Management Service might do to assist in implementing the gray whale research and monitoring program in the Bering and Chukchi Seas.

Commission-sponsored Reports Related to Gray Whale Habitat

Two Commission-sponsored contract reports on gray whales were completed in 1994. One report described sightings of feeding gray whales in the southwestern Chukchi Sea. The authors estimated that, during a one-day survey in summer 1989, 4,510 gray whales, or about 20% of the entire gray whale stock, were seen within the survey area. The whales were bottom-feeding, as indicated by mud plumes on the water surface that could be seen from the air. This report was sent with the aforementioned 2 December 1994 letter to the Minerals Management Service. The Commission pointed out the survey data showed that a substantial part of the eastern Pacific gray whale stock and its summer feeding areas possibly could be affected by exploration and development activities in the proposed lease areas.

A second contract report completed in 1994 described the reaction of gray whales to noise experiments conducted in San Ignacio Lagoon in 1983 and 1984 (see Appendix B, Jones *et al.* 1994). In the report, the authors concluded that gray whales left the lagoons, at least temporarily, in response to underwater playback of noises from boats, industrial activities, and other sources. These results suggest that noise associated with coastal development and related activities could cause whales to avoid and, if exposure to the noise is prolonged, to abandon areas that may be essential to calving, nursing, and breeding. Because of its relevance to possible degradation of gray whale habitat, this report was transmitted with the 16 December 1994 letter to the National Oceanic and Atmospheric Administration with the comment that noises generated by various human activities have the potential to adversely affect gray whales using the lagoons.

As noted earlier, the Commission continues to have concerns about the possible impact of human activities on essential gray whale habitats in Mexican lagoons and important feeding areas in high latitudes.

The Commission further believes that most adverse impacts can be avoided by careful planning and by conducting potentially disruptive activities during the times of the year when the whales are elsewhere. During 1995 the Commission will continue to review and provide advice on measures necessary to avoid or mitigate activities that could adversely affect gray whales and their essential habitats.

Vaquita (*Phocoena sinus*)

The vaquita, or Gulf of California harbor porpoise, is one of the rarest and smallest of all cetaceans. Found only in the northern Gulf of California, Mexico, it has the most limited geographic range of any marine cetacean. The species was first described in 1958 and, prior to 1984, there were fewer than 20 recorded sightings or strandings.

In 1978 the Government of Mexico added the vaquita to its list of wildlife species that are rare or in danger of extinction. The International Union for the Conservation of Nature and Natural Resources (now IUCN-The World Conservation Union) listed the species as vulnerable in its Red Data Book in 1979 and changed its status to endangered in 1991. It was listed on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora in 1979. The National Marine Fisheries Service listed the vaquita as endangered under the U.S. Endangered Species Act in 1985.

The size of the vaquita population is not known precisely. The best estimate to date was derived from a line-transect boat survey done in the upper Gulf of California in August 1993. Based on 22 sightings, it was estimated that the population within the area surveyed was 316 individuals (95 percent confidence interval of 118-847). The researchers conducting the work noted that this is a preliminary estimate that may be improved by further surveys. This is the first quantitative estimate of vaquita population size and it confirms previous assumptions and qualitative assessments that the species is very rare.

In addition to a small geographic range, the distribution of the species within that range is highly localized. Nearly all sightings of the species have occurred in a small area in the northwestern side of the Gulf of California, supporting the conclusion that the vaquita is restricted to relatively limited areas.

Additional data emerged in 1993 and 1994 that further emphasized the gravity of the species' condition. A sample of 56 vaquitas, most of them killed in fishing nets between 1985 and 1993, provided an opportunity to evaluate various vital parameters of the species. The results suggest that the life history of the vaquita appears to be similar to that of the highly exploited harbor porpoise population in the Bay of Fundy, Canada, with the important exception that calving does not appear to be annual and thus the potential rate of increase would be lower. These and other analyses also revealed the presence of unusual ovarian pathologies in many of the females sampled, that the population has little or no genetic variation, and that the population is comprised mainly of old and very young individuals. On the other hand, analysis of contaminants in tissue samples revealed that levels of chlorinated hydrocarbon pesticides and PCBs are low relative to small cetaceans in other parts of the world and do not appear to pose an immediate threat to the species.

Incidental Mortality in Fisheries

The greatest direct threat to the vaquita appears to be incidental catch in gillnets, primarily large-mesh nets used in fisheries for totoaba (itself an endangered species of fish), sharks, and other finfish. The vaquita has been caught incidentally in the totoaba fishery since the mid-1940s. The totoaba fishery peaked in the 1940s, and by the early 1970s the catch had declined dramatically as the species became depleted. The Mexican Government closed the fishery in 1975 to allow the totoaba to recover. Despite the closure, the fishery has continued at low levels, both as a legal experimental fishery and illegally. The National Marine Fisheries Service listed the totoaba as endangered under the U.S. Endangered Species Act in 1979.

Historical levels of vaquita incidental capture are not known. However, between February 1985 and

June 1991 the deaths of 121 vaquitas in fishing activities were documented. Of these, 78 died during illegal or experimental gillnet operations for totoaba, 32 died in shark and ray gillnets, and 11 died in gillnets set for sierra (a mackerel-like fish) and in shrimp trawls. At least five vaquitas are known to have died in fishing operations in 1992. Although the totoaba fishery was banned in 1975, at least until February 1992 some fishermen in the upper Gulf continued to fish for totoaba.

In February 1992 the Mexican Secretary for Fisheries published a regulation that reiterated the existing ban on the use of large-mesh gillnets in the northern Gulf of California. The action reinforced the June 1975 ban on the capture of totoaba and assigned responsibility to the Mexican Navy to enforce the ban. The ban prohibited the use of mesh sizes larger than 25 centimeters.

Fishing activities involving mesh sizes less than 25 centimeters were monitored in one of the four fishing ports between January 1993 and March 1994. This study revealed a total of 14 vaquita deaths in gillnets of mesh sizes between 7 and 15 centimeters and one probable death in a commercial shrimp trawl.

Vaquita are being caught in virtually all gillnet fisheries and in gillnet fisheries previously not monitored (*e.g.*, small-mesh nets). Therefore, mortality in the past may have been higher than previously believed. Also, given that the monitoring effort is not comprehensive and fishermen do not report all incidental takes, the actual mortality is probably much higher than reported.

Considering the low estimate of abundance, the low potential rate of increase, the unusual reproductive pathologies, and the limited distribution of the population, it is likely that the population cannot sustain the current rate of removal.

International Efforts to Protect Vaquitas

At its May 1991 meeting, the International Whaling Commission's Scientific Committee endorsed several recommendations regarding the vaquita. The Committee concluded that the vaquita is the world's most endangered marine cetacean and recommended that actions be taken to fully enforce the closure of the totoaba fishery and immediately halt illegal shipments of totoaba into the United States. It also recommended that a management plan be developed for the vaquita and its habitat that includes (1) an evaluation of incidental take of vaquita in fisheries, (2) alternative fishing methods and other economically viable activities to reduce further vaquita mortality in the illegal totoaba fishery, (3) provisions to increase awareness of the vaquita among fishermen and the public, and (4) a program to monitor the status and improve knowledge of the population biology of the species.

At its 1994 meeting, the IWC's Scientific Committee reviewed available information on the species and expressed extreme concern over the status of the species. It concluded that the current evidence indicates that present levels of incidental catches could result in extinction of the species.

The Scientific Committee endorsed a recommendation that monitoring of fishing activity and incidental mortality of the vaquita be conducted in the entire range of the species in the northern Gulf of California in order to obtain an estimate of total annual incidental mortality. The Committee recommended that census surveys be conducted to refine current estimates of abundance and improve understanding of the species' distribution patterns. In this regard, the Committee welcomed recent joint efforts by Mexican and U.S. Government agencies in the study of the vaquita and encouraged further cooperative efforts. The Committee recognized the importance of recent efforts by the Mexican Government to protect the vaquita and in particular commended it for the declaration of a biosphere reserve in the upper Gulf of California (see below) and the fishing ban in the core zone of the reserve. The Committee noted, however, that about 40 percent of the vaquita sightings made since 1986 have occurred outside the boundaries of the reserve. While the Committee recognized the utility of further research, in view of the precarious status of the vaquita, it recommended that immediate action be continued to eliminate incidental catches in the area.

In response to the findings of its Scientific Committee, the IWC at its 1994 meeting adopted a resolu-

tion commending the Mexican Government for the establishment of the biosphere reserve in the northern Gulf of California and calling on Mexico to move expeditiously in development an overall management plan for the reserve. The IWC resolution further invited member nations to offer the Mexican Government the technical, scientific, and financial assistance that may be needed to implement the management plan.

The Cetacean Specialist Group, a component of the IUCN Species Survival Commission, also considered the vaquita in its 1994-1998 Action Plan for the Conservation of Cetaceans. The plan noted that, while significant progress has been made to protect the vaquita over the past five years, the species is unquestionably in danger of extinction. The Cetacean Specialist Group will remain involved in efforts to conserve the species.

Creation of a Biosphere Reserve

On 10 June 1993 the Government of Mexico created, by Presidential decree, the Biosphere Reserve of the Upper Gulf of California and Colorado River Delta, mainly to protect the vaquita, totoaba, and their habitat.

Among the objectives of the reserve are to conserve the ecosystems of the Sonoran Desert, the upper Gulf of California, and the delta of the Río Colorado; provide permanent protection to unique species such as the totoaba, the vaquita, the desert pupfish, and various bird species; promote alternative economic activities that will raise the quality of life of residents; and conduct scientific investigations and provide environmental education in the region.

A draft management plan has been developed for the region that incorporates input from fishermen and residents along with information derived from renewed study of the area and its fauna. The plan describes the physical, biotic, social, economic, and cultural environments of the area as well as current activities to study, protect, and use the area's natural resources. The group developing the plan identified critical areas in the upper Gulf, described the various fisheries and how they are managed, assessed the potential economic effects caused by fishery closures, and provided recommendations for economic alternatives for fishermen. The approved final plan is expected to be completed by mid-1995.

In developing and implementing the management plan, regular meetings with residents have been and will be held to encourage exchange of information on the provisions of the reserve and to encourage residents' participation in protecting the reserve's resources. Programs and materials are being developed to educate visitors and residents about the natural history of the region, to encourage and guide eco-tourism activities, and to encourage local community involvement in resource protection.

Other Actions Taken within Mexico

In March 1992 the President of Mexico, through the Secretary for Fisheries, established the Comite Tecnico para la Preservacion de la Totoaba y la Vaquita (Technical Committee for the Preservation of the Totoaba and the Vaquita). It is comprised of scientists, educators, resource managers, and representatives of concerned institutions and agencies. The objectives of the Committee are to plan, evaluate, and coordinate research on the totoaba and vaquita and to recommend actions to preserve both species. The Committee consists of eight groups charged with assessing, quantifying, or reviewing (1) the distribution and incidental mortality levels of the vaquita, (2) the biology and ecology of the vaquita and the totoaba, (3) environmental impacts, (4) regional fishing activities, (5) plans for managing the region's resources, (6) economic alternatives for gillnet fishermen, (7) enforcement of regulations, and (8) education of fishermen and the general public about conserving marine resources in the northern Gulf of California.

Research and Conservation Efforts outside Mexico

As noted in previous annual reports, the Marine Mammal Commission provided funding for surveys in 1976 and again in 1979 to determine the distribution of the species (see Appendix B, Wells *et al.* 1981 and Appendix C, Villa-R. 1976). In the mid-1980s, the

Commission provided support for beach surveys along the shores of the northern Gulf of California to locate the remains of dead vaquitas and to train Mexican students in identifying, collecting, and preparing vaquita specimens for museums. In 1987 the Commission supported a study to determine environmental contaminants present in blubber samples of vaquitas incidentally caught and killed in fishing gear. The results of the latter study suggest that pollutants are not a significant threat to the vaquita.

Recognizing the need for a framework to coordinate international efforts to protect the vaquita, the Marine Mammal Commission consulted with the chairman of Mexico's Technical Committee for the Preservation of the Totoaba and the Vaquita about whether the Commission might usefully assist in developing a vaquita recovery plan. The offer was accepted and support was provided for the chairman of the Technical Committee to develop a recovery plan. The purposes of the plan are to encourage, guide, and coordinate research, conservation, and management efforts by environmental organizations, research institutions, and government agencies of Mexico and the United States.

The recovery plan was completed in March 1993 (see Appendix B, Villa-Ramírez 1993). It calls for assessments of the population's size and trends, distribution and range, and life history and ecology. It also calls for developing and implementing programs to educate fishermen and the general public on the vaquita, its status, and the more general need for conserving marine resources. Socioeconomic studies and an investigation of economic alternatives to gillnet fishing also are recommended. In 1993 the Commission provided additional support to the committee chairman to translate the plan into Spanish and distribute it to researchers and interested organizations and individuals in Mexico.

Efforts to Strengthen Import Restrictions

In November 1991 the Marine Mammal Commission wrote to the National Marine Fisheries Service and the Fish and Wildlife Service regarding the status and conservation needs of the vaquita. The Commission noted that illegal importation of totoaba appeared to be continuing and that the species was most often brought into the U.S. in the form of fillets. This made it impossible to distinguish totoaba from closely related species by visual inspection. Therefore the Marine Mammal Commission recommended that the National Marine Fisheries Service's Southwest Fisheries Science Center and the Fish and Wildlife Service's Forensics Laboratory work to develop a test to distinguish totoaba fillets from other fish fillets imported into the United States.

The Commission recommended that once this was achieved, the Services work together to (1) establish a cooperative program with Mexico to coordinate efforts to enforce the longstanding Mexican prohibition on totoaba fishing and the prohibition on importing totoaba into the United States, and (2) establish programs to inform the public about the endangered status of the vaquita and the totoaba, the link between the two species, applicable prohibitions of the Endangered Species Act, and the consequences of violating the Act.

In July 1992 researchers at the National Marine Fisheries Service's Southeast Fisheries Science Center isolated proteins unique to totoaba and successfully developed a biochemical test to distinguish totoaba from related species. During 1993 the National Marine Fisheries Service, in cooperation with the U.S. Customs Service, spent more than 400 hours attempting to detect and intercept illegally imported totoaba at eight crossing sites along the U.S.-Mexico border. The enforcement officials seized ten fish fillets suspected of being totoaba. The fillets were examined using the biochemical laboratory test, but in all cases analyses revealed that the fish were not totoaba.

In 1993 the National Marine Fisheries Service developed a brochure on the totoaba and the vaquita for dissemination to U.S. tourists entering Mexico. The brochure describes the distribution and external features of both species and discusses the prohibitions relative to capture or transport of either species. Several thousand copies were printed and distributed in 1993. The brochure was reprinted in 1994 and the Service continues to distribute the brochure to tourists entering Mexico.

In 1995 the Marine Mammal Commission will continue to track events related to the critical situation

of the vaquita and to help identify and encourage actions necessary to conserve the vaquita and its habitat in the northern Gulf of California.

Gulf of Maine Harbor Porpoise (*Phocoena phocoena*)

Harbor porpoises are small cetaceans found in temperate to sub-arctic coastal waters of the Northern Hemisphere. They feed principally on schooling fish such as herring and mackerel. Relatively discrete populations occur along both coasts of North America and off the shores of Europe, North Africa, and Asia. The species' nearshore distribution exposes it to high levels of pollution and human activity. Harbor porpoises are hunted for food by coastal residents in some areas, but incidental catch in coastal gillnets and to a lesser extent in herring weirs is now the largest source of direct human-related mortality in most areas.

Harbor porpoises along the east coast of the United States appear to be part of a single population sometimes called the Gulf of Maine harbor porpoise population. Other apparently separate populations in the western North Atlantic occur in the Gulf of St. Lawrence, off the east coasts of Newfoundland, Labrador, and Baffin Island, and along the west coast of Greenland. The extent to which these populations overlap, if at all, is not known.

The geographic name for the Gulf of Maine harbor porpoise population is somewhat misleading because animals undertake a seasonal north-south migration that can extend from the northern Bay of Fundy in Canada to Cape Hatteras, North Carolina. The greatest sighting densities occur in the northern Gulf of Maine and the Bay of Fundy in late summer. By late autumn, most animals have moved to the southern Gulf of Maine. Their winter distribution is not well known; however, sighting and stranding records suggest a broad distribution from New England to Cape Hatteras. Records of animals south of North Carolina are very rare.

Information on the size and trend of the Gulf of Maine harbor porpoise population is limited. The best data are from summer surveys done by the National Marine Fisheries Service in 1991 and 1992. Harbor porpoises, however, are difficult to see and count, and consequently abundance estimates from these surveys have wide confidence limits. Results of the 1991 and 1992 surveys produced estimates of 37,500 animals (95 percent confidence interval 26,700 to 86,400) and 67,500 animals (95 percent confidence interval 32,900 to 104,600), respectively. By pooling the survey results, a weighted estimate of 47,200 animals (95 percent confidence interval 39,500 to 70,600) has been derived and currently is considered the best available estimate of population abundance. Because no comparable surveys were done prior to the 1990s or in 1993 or 1994, a direct measure of recent population trends is not possible.

The principal threat to the population — incidental take in U.S. and Canadian gillnet fisheries — may have been affecting the population since the 1970s. By the early 1980s a subjective analysis, combining anecdotal information with the very limited catch data then available, indicated something on the order of 600 porpoises per year were being taken incidentally from the Bay of Fundy, the Gulf of Maine, and U.S. mid-Atlantic coastal waters. A comparison of body lengths between samples of porpoises collected in 1969-1973 and 1981-1986 also suggested that removals were affecting the population. While calves tended to be larger in the latter period, the population overall was composed of smaller animals. It thus appeared that individuals were not living to older ages and that the calf-bearing period of mature females was becoming shorter.

The 1988 amendments to the Marine Mammal Protection Act directed the National Marine Fisheries Service to establish an observer program to monitor the incidental take of marine mammals in fisheries. Among other things, the new program significantly improved data on the number of harbor porpoises taken incidentally by commercial sink gillnet fishing off New England. For harbor porpoises, the ratio of catch landings to the number of animals caught in an observed portion of the fishery was extrapolated to the entire fishery based on overall landings. This measure has inherent biases because it does not provide a direct measure of actual fishing effort; however, in the absence of a better measure of gillnet fishing

effort, the present approach for estimating total incidental take of harbor porpoises appears to be the best available.

From these data the Service in 1993 estimated that 2,400, 1,700, and 900 harbor porpoises were caught and killed in the northeast U.S. sink gillnet fishery in 1990, 1991, and 1992, respectively. In 1994 the Service revised these estimates upward to account for the number of dead porpoises that fell out of nets before they were counted by observers. The new estimates for those three years are 2,900, 2,000, and 1,200 porpoises, respectively. The estimate for 1993 is 1,400 porpoises. An estimate of the incidental take in the U.S. fishery in 1994 had not been announced as of the end of 1994.

As noted above, harbor porpoises from the same population also are taken in gillnet fisheries off Canada and the U.S. mid-Atlantic states. Little information on catch rates has been available from these areas. However, during the Marine Mammal Commission's annual meeting 16-18 November 1994 in Falmouth, Massachusetts, a representative of the Canadian Department of Fisheries and Oceans reported on incidental take estimates derived from a program started in 1993 to reduce porpoise bycatch in the Canadian gillnet fishery in the Bay of Fundy. The estimated take from that area in 1993 is 424 porpoises. The Canadian representative also reported that observer effort was being increased in 1994 and that, while an estimate for 1994 is not yet available, take levels appear likely to be lower in 1994 because of reduced fishing effort. The Department plans to continue its program in 1995.

With regard to incidental take south of New England, some 50 harbor porpoise strandings were reported from late February to mid-May 1993, a large proportion of which had net marks or injuries indicating they were killed in fishing nets. During the Commission's annual meeting, representatives of the Service noted that little new information had been developed to identify the specific fisheries involved or the level of take off the U.S. mid-Atlantic states.

Together, the above information strongly indicates that incidental take of harbor porpoises from the Gulf of Maine population has exceeded sustainable levels.

Proposal to List Gulf of Maine Harbor Porpoises under the Endangered Species Act

In light of information on the status of harbor porpoises off the northeastern United States, the Sierra Club Legal Defense Fund petitioned the National Marine Fisheries Service in September 1991 to list the Gulf of Maine harbor porpoise population as threatened under the Endangered Species Act. The Service requested comments on the action in December 1991. Substantial information indicated that the action may be warranted, and the Service published a proposed rule in the *Federal Register* on 7 January 1993 to list the population as threatened.

The analysis accompanying the Service's proposed rule noted among other things that at least 2,000 harbor porpoises were being caught incidentally in regional gillnet fisheries, that the minimum bycatch was about 4.5 percent of the best population estimate, that incidental take was exceeding sustainable levels, and that regulations necessary to reduce the level of bycatch did not exist. It also concluded that if the bycatch was not reduced, the harbor porpoise population likely would become endangered within the foreseeable future throughout all or a significant portion of its range.

In 1993 and 1994 the Service deferred final action on the proposed rule to allow time for analysis of new information and to receive further public comment. On 5 April 1993 the comment period was extended through 7 August in response to numerous requests for public hearings on the proposed listing. During that period, the New England Fishery Management Council requested a further six-month delay to consider disparities in recent bycatch estimates and certain other questions. The Service granted the Council's request and announced the delay on 8 November 1993. On 15 July 1994 a one-month extension was announced to obtain public comment on the estimated 1993 bycatch level and the revised bycatch estimates for 1990 through 1992. A final one-month extension was announced on 11 August 1994 to obtain public comment on a document prepared by the Service's Northeast Fisheries Science Center explaining the rationale for its upward revision of the bycatch estimates for 1990 through 1992.

On 22 September 1994 the Commission, in consultation with its Committee of Scientific Advisors, wrote to the Service in response to the 11 August request for comments. The Commission noted its belief that the information reviewed in the January 1993 proposal justified the proposed listing, that more recent information on the harbor porpoise incidental take rate indicates that the situation is actually worse than was believed in January 1993, and that the population likely continued to decline in 1992 and 1993. Accordingly, the Commission recommended that the Service immediately proceed with its proposed action to list the Gulf of Maine harbor porpoise population as threatened.

As of the end of 1994 final action on the proposed listing had not been taken and the Commission had been advised that the Service expected to announce its decision on the matter early in 1995.

Harbor Porpoise Population Stock Assessments

As discussed in Chapter V, the 1994 amendments to the Marine Mammal Protection Act require that the National Marine Fisheries Service prepare assessments of the status of marine mammal stocks to provide a basis for managing interactions with commercial fisheries. Among other things, the stock assessments are to include estimates of population parameters (*e.g.*, minimum population estimates and maximum and net productivity rates), estimates of annual mortality and serious injury from commercial fishing operations and other human-related sources, and an estimate of the potential biological removal level that the stock could safely support. The Act also provides that certain stocks needing special management attention be designated as strategic stocks. Such stocks are to include those that are designated as threatened, endangered, or depleted; are declining and likely to be listed as threatened; or are experiencing direct human-related mortality that exceeds their estimated potential biological removal level.

On 15 August 1994 the National Marine Fisheries Service forwarded draft stock assessments for the marine mammal species under its jurisdiction to the Commission and asked for comments. Included were draft stock assessments for five harbor porpoise populations: those of the Gulf of Maine/Bay of Fundy, central California, northern California, the coasts of Oregon and Washington, and Alaska.

The draft stock assessment for the Gulf of Maine/Bay of Fundy harbor porpoise population concluded that the best minimum population size estimate was 39,670 animals, the best estimate of potential population growth was four percent, and the potential biological removal level was 516 animals. It also concluded that "the total level of human-caused mortality and serious injury is unknown, but is believed to be medium (0.5-2%) to high (2%), since not all potential problem fisheries (*i.e.*, U.S. mid-Atlantic coastal gillnets and Canadian east coast) are adequately observed." Noting its proposal to list the Gulf of Maine harbor porpoise population as threatened under the Endangered Species Act and the high level of incidental take relative to the calculated potential biological removal level, the Service's draft assessment also concluded that the stock should be classified as a strategic stock.

On 12 December 1994 the Commission, in consultation with its Committee of Scientific Advisors, returned comments to the Service on the draft assessments for stocks off the U.S. east coast and in the Gulf of Mexico. In its letter, the Commission noted that recent incidental take data for the Gulf of Maine harbor porpoise population indicate human-caused mortality has been substantially greater than two percent of the minimum population estimate. The Commission also noted that the stock clearly meets the criteria for a strategic stock and that, as mandated by the 1994 amendments to the Marine Mammal Protection Act, a take reduction team should be formed immediately.

The Commission's comments on the stock assessments for four west coast harbor porpoise populations were provided to the Service on 1 December 1994 as part of its comments on the assessments for marine mammal stocks off Alaska, Hawaii, Washington, Oregon, and California. The stock assessments for harbor porpoise populations on the west coast noted that, in sharp contrast to harbor porpoises on the east coast, movement patterns appear far more restricted. Based on their review of incidental take data and estimated potential biological removal levels, the assessments concluded that none of the west coast

harbor porpoise stocks would be considered strategic stocks.

With regard to these stocks, the Commission noted that the basis for concluding that harbor porpoises off the coasts of northern California, Washington, Oregon, and British Columbia constituted separate stocks was not evident and that further discussion should be provided to support the proposed stock definitions. The Commission also noted that it was not clear whether all the fisheries that could potentially take harbor porpoises off northern California, Oregon, Washington, and Alaska had been identified and it suggested further information be provided in this regard. The review of fishery interactions was particularly weak and the Commission commented that the information provided was not sufficient to justify the conclusion that the Alaska stock should not be considered a strategic stock.

At the end of 1994 the Service was reviewing comments by the Commission and others and had not yet completed final stock assessment reports.

The Northeast Multispecies Fishery

In 1986 the New England Fishery Management Council developed and the National Marine Fisheries Service adopted a fishery management plan to manage the catch of various groundfish species (*e.g.*, cod, flounder, and haddock) caught off New England by trawl, longline, and sink gillnet gear. In October 1992 the Service asked the Council to develop a plan amendment to reduce the incidental take of harbor porpoises in sink gillnets. In response the Council established a harbor porpoise subgroup to analyze observer program data for 1991 and 1992 with regard to take levels in different areas and times. Concurrently, the Council prepared an amendment to the plan that could be implemented in 1994 to address a serious overfishing problem, as well as the harbor porpoise incidental take problem.

Late in September 1993 the Council's harbor porpoise subgroup completed its report. It identified incidental take levels in four areas based on the 1991 and 1992 observer program data. Most of the incidental take of harbor porpoises occurred in two areas during particular fishing periods: (1) a "mid-coast" area from northern Massachusetts Bay to southern Penobscot Bay, Maine, including an area known as Jeffreys Ledge off the Massachusetts-New Hampshire border, from October to December, and (2) a "northeast" area from southern Penobscot Bay to the Canadian border from June to September. From the observer program and fish landings data for 1991 and 1992, catch from the two areas during the indicated months accounted for 74 and 83 percent of the harbor porpoise catch, respectively, and 26 and 31 percent of the sink gillnet fish landings, respectively. Harbor porpoise take was particularly high in the Jeffreys Ledge area.

However, to implement harbor porpoise take reduction measures along with other provisions to prevent overfishing in 1994, the Council had to proceed with a recommended action before fully considering its subgroup's report. Thus, early in October 1993 the Service asked the Commission to review a proposed framework amendment recommended by the Council. The amendment proposed reducing incidental take over a four-year period to an annual level of not more than two percent of the estimated harbor porpoise population size. Because the Council had not fully considered possible time-area closures, the amendment proposed an interim approach to phase in monthly no-fishing periods over a five-year period pending development of time-area closures. It called for one 4-day no-fishing block each month during the first year, increasing to four 4-day blocks per month by the fifth year.

On 15 November 1993 the Commission commented to the Service on the proposed amendment. Among other things, the Commission noted that the proposal made no allowance for the take of harbor porpoises in areas other than New England and it questioned whether the harbor porpoise population could sustain a two percent mortality rate from the New England fishery alone. Additionally, current incidental take in the U.S. fishery appeared to be twice the amendment's two percent target rate, and the Commission noted that taking four years to reach the target level, even if successful, could allow a significant further decline in a population already reduced to a point that it was being considered for listing as threatened.

Therefore, the Commission recommended that the take reduction goal be justified or revised to seek a more expeditious reduction in incidental take, such as an immediate 50 percent reduction, from current take levels. It also recommended that a long-term incidental take level be derived as soon as possible based, in part, on a review of harbor porpoise mortality external to the northeastern U.S. sink gillnet fishery. With regard to the interim four-day block closure, the Commission recommended that four 4-day no-fishing blocks per month be implemented during the first month and that this be continued pending adoption of new time-area closures referred to in the amendment.

On 1 March 1994 the Service published final rules in the *Federal Register* to implement the Council's proposed amendment. The final rules did not address the adequacy of the Council's long-term take reduction goal but did include regulatory measures to be implemented immediately for the first year of its four-year take reduction program. With regard to the Commission's recommendation to increase the number of monthly no-fishing blocks from one to four in 1994, the Service stated that it had limited authority to modify a Council recommendation and had therefore accepted the Council recommendation of one four-day block per month to begin on 15 April 1994.

The harbor porpoise bycatch reduction measure was deferred, however, and a new system of time-area measures recommended by the Council were adopted by the Service effective 20 May 1994. Final rules for the new system were published in the *Federal Register* on 25 May 1994. The rulemaking procedures followed by the Service bypassed the proposed rule step in light of the fact that the Council had held two public hearings on the matter early in 1994.

The Council recommended three seasonal closures that were significantly smaller than the areas defined in the report of its harbor porpoise subgroup and were effective for shorter periods. For example, the boundary of the recommended mid-coast closure excludes much of Jeffreys Ledge, the area with perhaps the highest incidental take of harbor porpoises, and is effective only in November, rather than the October-through-December period considered in the subgroup report. Similarly, the boundary of the recommended northeast closure did not include offshore areas included in the area boundaries considered in the subgroup report, and it applied only from mid-August to mid-September, rather than June through September.

In the discussion accompanying the final rule, the Service stated that, while it was difficult to estimate the extent to which the selected boundary would reduce harbor porpoise take, it thought it was reasonable to expect a 20 percent reduction in such taking under the rules. This analysis, however, did not account for the displacement of fishing effort from closed areas to open areas, where harbor porpoises are also caught. Also, closure line was drawn through areas where porpoise takes are high. Thus, it seems questionable whether the adopted measures will reduce harbor porpoise take by 20 percent.

Commission Review of Harbor Porpoise Incidental Take Reduction Plans

During its annual meeting 16-18 November 1994 the Commission and its Committee of Scientific Advisors reviewed the status of the Gulf of Maine harbor porpoise population, efforts to reduce incidental take in the regional gillnet fisheries, and the provisions in the 1994 amendments to the Marine Mammal Protection Act to manage the incidental take of marine mammals in commercial fisheries. Representatives of the Service, the Council, and regional gillnet fishermen participated in the meeting. Based on discussions at the meeting, the Commission wrote to the Service on 30 November 1994 recommending further steps to reduce the incidental take of harbor porpoises.

In its letter the Commission noted that the 1994 amendments to the Marine Mammal Protection Act agreed to by representatives of the fishing industry and environmental groups provide clear guidance for developing a cooperative approach to reduce incidental take. Specifically it noted that the new provisions call upon the Service to establish a take reduction team for each stock classified as a strategic stock. The teams are to develop plans for reducing within six months fishing-related mortality to levels less than the calculated potential biological removal level. As noted above, the potential biological removal level in the

Service's draft stock assessment for Gulf of Maine harbor porpoises is 516 porpoises. Recent incidental take levels are several times this level and, thus, there is no doubt that the stock meets the strategic stock classification criteria.

The Commission therefore recommended that the Service immediately establish a take reduction team for the Gulf of Maine harbor porpoise stock and that the team begin developing a plan for reducing the combined incidental take of harbor porpoises by gillnet fisheries off the northeastern United States, Canada, and the mid-Atlantic coastal states to levels below the stock's estimated potential biological removal level. Because cooperative actions in Canada will be needed to meet this objective, the Commission also recommended that the Service maintain a dialogue with appropriate officials of the Canadian Government and that one or more Canadian representatives be invited to participate on the Gulf of Maine harbor porpoise take reduction team.

The Commission also noted that development and implementation of a take reduction plan could take a year or longer once a team is established. In the interim, incidental take reduction efforts would continue to be subject to provisions of the amended Northeast Multispecies Fisheries Management Plan, which call for bringing the total take by the U.S. fishery to levels below two percent of the estimated population size by 1999. In light of this situation, the Commission recommended that the Service ask the New England Fishery Management Council to develop an accelerated schedule for phasing in incidental take reduction measures to more closely reflect the requirements in the 1994 amendments to the Marine Mammal Protection Act. While meeting the statutory goal for reducing take from the stock will be difficult, the Commission commented that the most equitable approach for phasing in take reduction measures is to do so in as close to equal increments as possible over the next few years.

In this regard, the Commission also noted that catch rates for one of the two areas where incidental take is most common (*i.e.*, the mid-coast area) begin increasing in June. Therefore, the Commission also recommended that the Service ask the Council to develop its recommendations for strengthened time-area closures so as to be in place by June. To facilitate this schedule, the Commission recommended that, if the Service had not already done so, it immediately provide the Council with updated results from the observer program.

During the Commission's annual meeting, the Service also advised the Commission of its plans to undertake two important research projects in 1995 concerning harbor porpoises off New England. One involves research on the structure of harbor porpoise stocks in the North Atlantic and the other to conduct another estimate of the abundance of harbor porpoises in the Gulf of Maine/Bay of Fundy region. In its 30 November letter, the Commission expressed strong support for both projects and asked to be advised immediately of any changes in the Service's plans to carry them out.

Use of Acoustic Alarms to Deter Harbor Porpoises from Nets

Recognizing the need to reduce incidental take of harbor porpoises, commercial gillnet fishermen and scientists in New England, with financial support from the National Marine Fisheries Service, initiated pilot studies in 1991 to determine if acoustic deterrents could be used to make harbor porpoises avoid fishing nets. The studies, which were continued in 1992 and 1993, involved attaching acoustic alarms, or pingers, at different locations on some nets and comparing the numbers of harbor porpoises caught with the number taken in nets without alarms.

Similar investigations have been done involving other marine mammal species taken in other fisheries; however, with the exception of some studies involving the baleen whales, the results have been equivocal. Therefore, the Commission wrote to the Service on 6 June 1993 suggesting that a group of experts be convened to critically evaluate the results of past studies and to review the design of the additional studies being undertaken and considered by the Service. The Service agreed and at the end of 1993 the workshop was tentatively planned for spring 1994. Early in 1994 the Service's Southwest Fisheries Science Center offered to convene the workshop, provided it was held in the fall of 1994.

The new workshop date was too late in the year to provide timely advice on acoustic deterrent work on harbor porpoises off New England, and the National Marine Fisheries Service therefore convened a scientific review panel on 9-10 June 1994 in Seattle, Washington, to examine the results of the studies done through 1993. The panel concluded that the studies were inconclusive with respect to the effectiveness of pingers in reducing the incidental catch of harbor porpoises. Problems with the experimental design, the way the studies were implemented, and the small number of harbor porpoises taken in the experiment were cited as reasons for the panel's conclusion. However, it also concluded that further work was warranted and recommended various experimental design measures that would contribute to determining with statistical reliability whether acoustic alarms reduced the harbor porpoise bycatch in sink gillnets.

After the panel meeting, the National Marine Fisheries Service transferred funds to the National Fish and Wildlife Foundation to support further studies of acoustic deterrents in the northeast sink gillnet fishery. The Foundation subsequently asked the Commission to review a research proposal it had received to extend the acoustic deterrent studies. As recommended by the panel, the study included measures to avoid biased results, including attaching operable and inoperable pingers to an equal number of commercial gillnets without fishermen's knowledge as to which nets had operable pingers. To encourage industry cooperation, the proposal also called for reimbursing participating fishermen for fuel costs and allowing them to fish in areas otherwise closed to gillnet fishing. It also called for placing observers aboard all vessels participating in the experiment.

The Commission, in consultation with its Committee of Scientific Advisors, returned comments to the Foundation on 2 September 1994. The Commission identified a number of inconsistencies in the proposal as well as details needing further clarification. It also noted that further consideration and justification should be provided regarding the plans to conduct the experiment in closed fishing areas and its effect on adopted bycatch reduction measures. The authors of the proposal subsequently modified the proposal based on comments by the Commission and numerous other reviewers. The Foundation then awarded a grant to carry out the work and the National Marine Fisheries Service authorized the study to be undertaken in designated no-gillnet fishing areas and provided some supplemental funds to pay for observers on all participating vessels. Field work was begun in October 1994 and completed in December. The results are expected to be available in 1995.

As of the end of 1994 the acoustic deterrent workshop, which the Southwest Fisheries Science Center agreed to host in the fall, had again been deferred due to scheduling conflicts. It was the Commission's understanding that planning and arrangements for the workshop were still under review by the Service. In anticipation of the proposed workshop, the Commission contracted in 1993 for a review and evaluation of past studies done to assess the usefulness of acoustic deterrents for reducing incidental catch of marine mammals in fisheries. The contractor completed a report with annotated bibliography, which was being published at the end of 1994.

Polar Bear (*Ursus maritimus*)

Polar bears occur throughout the northern polar region, ranging as far north as the pole. Off Alaska, their southern limit is St. Matthew Island in the Bering Sea. There are believed to be six relatively discrete polar bear populations, two of which occur in Alaska. These are the western Alaska (Bering-Chukchi Seas) population shared with Russia and the northern Alaska (Beaufort Sea) population shared with Canada. The total number of polar bears off Alaska is estimated at 3,000 to 5,000 animals and appears to be stable.

During the first half of the 20th century, polar bears were taken primarily by Natives, both for subsistence purposes and for the sale of hides. Beginning late in the 1940s, a sport hunt developed; this involved trophy hunters using professional guides to hunt animals with the use of aircraft. As a result, hunting pressure on the Alaska polar bear populations increased substantially. Recognizing this, the State of Alaska adopted regulations in 1961 to restrict the sport hunting season and require hunters to present all

polar bear skins for tagging and examination. At the same time, preference was provided to subsistence hunters, and a prohibition was adopted on shooting cubs and females with cubs. Between 1961 and 1972 an average of 260 polar bears were taken annually in Alaska, 75 percent of which were males. In 1972 the State of Alaska banned hunting with the use of aircraft.

Also in 1972, enactment of the Marine Mammal Protection Act established a moratorium on the take of polar bears and other marine mammals and transferred management responsibility from the states to the Federal Government. Under the Act, Alaska Natives are allowed to take polar bears and other marine mammals for subsistence purposes and for purposes of creating and selling traditional handicrafts and clothing. The Act does not restrict the number of animals that can be taken or prohibit the take of cubs or females with cubs by Alaska Natives, provided that the take is not wasteful.

Because of the species' circumpolar distribution, efforts to protect and conserve polar bears require the cooperation of several countries. Recognizing this, in 1973 the Governments of Canada, Denmark (for Greenland), Norway, the Soviet Union, and the United States concluded an agreement to conserve polar bears and their habitat throughout the Arctic.

During 1994 the Fish and Wildlife Service completed work on a polar bear conservation plan and furthered efforts to conclude agreements with the Russian Federation and Russian Natives on cooperative research and management of shared polar bear populations. (See Chapter VI for a more complete discussion of ongoing efforts to develop a cooperative U.S.-Russian research and management agreement.) In addition, the 1994 amendments to the Marine Mammal Protection Act included a number of measures related to polar bears. These and other activities are discussed below.

Polar Bear Conservation Plan

In 1988 Congress amended the Marine Mammal Protection Act to direct the Secretaries of the Interior and Commerce to develop conservation plans for depleted and, when appropriate, non-depleted marine mammal species and populations. In January 1989 the Marine Mammal Commission recommended to the Fish and Wildlife Service that it prepare conservation plans for polar bears, walruses, and sea otters in Alaska. To help in this task, the Commission developed and provided preliminary draft conservation plans for the three species. The preliminary draft conservation plan for polar bears was forwarded to the Service on 28 June 1992.

During 1992 and 1993 the Commission worked closely with the Service to ensure that the polar bear conservation plan accurately identified research and management actions necessary to determine and maintain populations in Alaska within their optimum sustainable population range, as required by the Marine Mammal Protection Act. This effort is discussed in detail in the previous annual report.

On 8 December 1993 the Service forwarded revisions of the three plans to the Commission and others who had been involved in plan development for review and comment. In the accompanying letter, the Service noted that all three plans had undergone substantial revision based on comments received on the earlier drafts. The Service noted that the revised plans placed greater emphasis on cooperation between the Service and various Alaska Native organizations that deal with marine mammal conservation.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the final drafts of the plans, and by letter of 11 March 1994 provided comments to the Service. With respect to the polar bear conservation plan, the Commission noted that the draft was greatly improved over earlier versions and commended the Service for responding to reviewers' comments. With regard to the Service's proposal to establish cooperative agreements with Native user groups, the Commission noted that polar bears occur also in areas under jurisdiction of the State of Alaska. It therefore recommended that the State, through its Department of Fish and Game, be a third party to any cooperative agreements between the Service and Native groups.

With reference to the draft conservation plan's discussion of a proposed statewide Alaska Polar Bear

Commission and the need for a Native polar bear conservation and management agreement, the Commission stated that it agreed with the concept of an Alaskan Polar Bear Commission and strongly endorsed the concept of a management agreement for northwest Alaska.

The Commission also noted that, with regard to suggested conservation measures for a polar bear management plan for northwest Alaska, that the Service's draft plan listed some but not all of the conservation measures included in the 1989 agreement between Natives in Alaska and Canada for cooperative management of the Beaufort Sea polar bear population. Specifically, the draft plan did not address prohibitions on taking of cubs and use of aircraft and large motorized vessels for hunting. The Commission pointed out that the 1973 Agreement on the Conservation of Polar Bears, to which the United States is party, calls for prohibitions on both these activities. (See Chapter VI for additional discussion of international agreements regarding polar bears).

On 16 September 1994 the Service forwarded to the Commission and others copies of the final conservation plan for the polar bear in Alaska, dated June 1994, as well as conservation plans for walruses and sea otters in Alaska. In its transmittal letter, the Service noted that the plans would be reviewed annually and considered for rewriting and updating in three to five years.

Polar Bear Trophy Imports

The Marine Mammal Protection Act prohibits the import of any marine mammal or marine mammal part, except for scientific research, public display, and enhancement purposes, unless a waiver of the moratorium is first obtained following formal rule-making procedures. Since the Act took effect in 1972, sport hunters have argued that the waiver requirements present unsurmountable obstacles for obtaining authority to import polar bear trophies legally taken in Canadian sport hunts.

In response to these concerns, in 1994 Congress amended the Act to include a new permitting authority under which polar bear trophies may be imported from Canada. Import permits for polar bear parts (other than internal organs) from bears taken legally in the Canadian sport hunt, including bears taken prior to enactment of the 1994 amendments, may be issued if the Secretary of the Interior, in consultation with the Marine Mammal Commission, determines that (1) Canada has a monitored and enforced sport hunting program consistent with the purposes of the international Agreement on the Conservation of Polar Bears, (2) the Canadian sport hunting program is based on scientifically sound quotas that ensure the maintenance of the affected population stock at a sustainable level, (3) the export from Canada and import into the United States are consistent with the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and other international agreements and conventions, and (4) the export and subsequent import are not likely to contribute to illegal trade in bear parts. The Secretary is directed to charge a reasonable fee for the issuance of polar bear import permits to be used for developing and implementing cooperative research and management programs for the conservation of polar bears in Alaska and Russia.

The Secretary is further directed to undertake a scientific review of the impact of issuing import permits on the polar bear populations in Canada. The review is to be subject to public comment and is to be completed by 30 April 1996. No permits authorizing the importation of polar bear trophies from Canada may be issued after 30 September 1996 if the review indicates that the issuance of such permits is having a significant adverse effect on Canadian polar bear stocks.

In mid-1994 the Fish and Wildlife Service began work on developing proposed regulations to implement the new import measures. On 24 August 1994 Commission staff members consulted informally with the Service on the progress being made. Subsequently the Service provided the Commission with a draft *Federal Register* notice regarding development of the regulations to govern polar bear imports, and the Commission responded by letter of 19 October 1994. In both the informal discussions and in its 19 October letter, the Commission noted that, under the amendments, the Service will not be able to act on any application to import polar bear trophies until it resolves several outstanding questions and is able to

make the findings required under section 104(c)(5)(A) of the Marine Mammal Protection Act.

In this regard, the Commission indicated that in order to make the required findings, the Secretary of the Interior would require sufficient information to answer the following kinds of questions:

- Is the Canadian sport hunting program consistent with the purposes and provisions of the 1973 Agreement on the Conservation of Polar Bears? For example, has Canada implemented the provisions of the agreement prohibiting use of aircraft and large motorized vessels?
- Are the quotas scientifically sound and designed to maintain the affected populations at their optimum sustainable population levels?
- Does Canada have an adequately monitored and enforced sport hunting program?
- What criteria will be used in 1996 to decide whether issuance of permits authorizing the import of polar bear parts into the United States has had a significant adverse impact on the polar bear population stocks in Canada and what information will be necessary to make the required determinations?

On 27 October 1994 the Fish and Wildlife Service published in the *Federal Register* a notice of intent and provided information on steps the Service was taking to implement the new import provisions. In the notice, the Service noted that it was working concurrently on developing permit regulations and gathering data to make the legal and scientific findings required under section 104(c)(5)(A). The Service further noted that applications for the import of sport hunted polar bear trophies will not be accepted until the completion of the permit rulemaking process early in 1995. In the *Federal Register* notice, the Service stated that it anticipated publishing a proposed rule on permit requirements by November 1994.

At the end of 1994 the proposed rule had not been published. It was the Commission's understanding that early in January 1995 the Service planned to issue a proposed rule to establish application requirements, permit procedures, issuance criteria, and permit conditions. This was to be followed by a second notice, to be published early in 1995, that would address the legal and scientific findings required by the 1994 amendments.

Stock Assessments

As discussed in Chapter V and elsewhere in this report, the 1994 amendments to the Marine Mammal Protection Act directed the Secretaries of Commerce and the Interior to prepare marine mammal stock assessments to serve as the scientific basis for a new regime governing the taking of marine mammals incidental to commercial fisheries. In August 1994 the Fish and Wildlife Service distributed to the Marine Mammal Commission and others draft stock assessments for marine mammal populations under its jurisdiction, including polar bear stocks in the Beaufort Sea and the Chukchi and Bering Seas. The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the drafts and, by letter of 1 December 1994, provided comments to the Service.

In its letter, the Commission noted that the draft stock assessments concluded that both stocks are at or approaching their carrying capacity level. In the Commission's opinion, the conclusions concerning the Beaufort Sea stock appeared reasonable but were based largely on unpublished data and papers in preparation. Therefore, it was not possible to fully judge the likely validity of the conclusions.

The conclusion that the Chukchi/Bering Sea stock is at or near carrying capacity did not follow logically from the information and analyses provided in the draft assessment. The Commission noted that the assessment should describe ongoing efforts by Alaska Natives and the governments of the United States and Russia to develop an agreement for cooperatively assessing and monitoring the status of this population and for establishing and enforcing harvest limits and other needed conservation measures. (See Chapter VI for further discussion of this issue.)

With respect to the size of the Chukchi/Bering Seas polar bear population, the Commission noted that the estimated population range and thus the estimate of minimum population size may be very conservative. It suggested that a possible alternative means for estimating minimum population size would be to

estimate the number of bears that would be required to produce the number of cubs coming from known denning areas on Wrangel and Herald Islands and that proportion of the Chukotka mainland that contributes to the Chukchi/Bering Seas stock.

The Commission further noted that the draft assessment failed to note that the impact of removals from the affected stock will depend on the age and sex as well as the number of bears removed. The draft assessment did not identify or evaluate the possible effects of activities such as coastal and offshore oil and gas development that may be affecting polar bears and their habitat in both the Beaufort Sea and the Chukchi/Bering Seas. Likewise, the draft assessment did not describe critical uncertainties concerning the status of and threats to the affected stocks and the research and management measures necessary to resolve the uncertainties.

Habitat Conservation Strategy

Section 101(a)(5) of the Marine Mammal Protection Act directs the Secretaries of the Interior and Commerce to authorize, in certain instances, the unintentional taking of small numbers of marine mammals by United States citizens incidental to activities other than commercial fishing operations. As noted in the previous annual report, on 16 November 1993 the Fish and Wildlife Service issued regulations to authorize and govern the take of small numbers of polar bears and walruses by U.S. citizens engaged in oil and gas exploration, development, and production activities in the Beaufort Sea and adjacent northern coast of Alaska. In issuing the regulations, the Secretary of the Interior directed the Fish and Wildlife Service to develop and begin implementing a Polar Bear Habitat Conservation Strategy in furtherance of the goals of Article II of the international Agreement on the Conservation of Polar Bears.

Whereas other small-take exemptions have been issued for five years (see further discussion in Chapter X), in the case of the Beaufort Sea, the Service limited authorization for small takes to 18 months pending completion of a polar bear habitat conservation plan.

During 1994 the Service held a number of public meetings to discuss issues and obtain input concerning the habitat conservation strategy. Participants included representatives of Native groups, the oil and gas industry, environmental and wildlife protection groups, as well as officials of the Alaska Department of Fish and Game, the North Slope Borough, the Minerals Management Service, the Department of State, and the Marine Mammal Commission. Also as part of the process, Service representatives visited 12 Alaskan coastal communities to discuss habitat-related issues with polar bear hunters.

At the end of 1994 the Commission understood that the Service was completing work on the draft polar bear habitat conservation strategy and it would be circulated for review and comment early in 1995.

Sea Otter (*Enhydra lutris*)

The sea otter is the only member of the genus *Enhydra*, and, with the exception of the marine otter (*Lutra felina*) in South America, is the smallest marine mammal in the world. Three subspecies of sea otters have been proposed; they are *E.l. lutris*, *E.l. nereis*, and *E.l. kenyoni*.

Prior to the mid-18th century, sea otters inhabited nearshore waters of the North Pacific Ocean, from Hokkaido in northernmost Japan through the Kuril Islands, Kamchatka Peninsula, the Commander Islands, the Aleutians, peninsular and south coastal Alaska, and southward down the west coast of North America to Baja California. It is estimated that the worldwide population of sea otters at that time was 150,000 to 300,000.

With the Russian discovery of Alaska in 1741, sea otters became the target of intense commercial exploitation that continued without regulation for 150 years. By the early 1900s, only 13 small and widely scattered remnant groups survived, and total abundance may have been as low as 1,000 to 2,000 animals.

The North Pacific Fur Seal Convention of 1911, an agreement between the United States, Russia, Great

Britain, and Japan, brought an end to commercial hunting. With this protection, sea otters have recolonized or have been reintroduced into a substantial part of their historic range in Russia, the Aleutian Islands, south coastal Alaska, Washington, and California.

Table 7. California sea otter population counts by the Fish and Wildlife Service and the California Department of Fish and Game, 1982-1994

Year	Independent Otters	Dependent Pups	Total
1982 Spring	1,124	222	1,346
Fall	1,194	144	1,338
1983 Spring	1,131	120	1,251
Fall	1,062	164	1,226
1984 Spring	1,181	123	1,304
Fall	—	—	—
1985 Spring	1,124	236	1,360
Fall	1,066	155	1,221
1986 Spring	1,345	225	1,570
Fall	1,088	113	1,201
1987 Spring	1,430	220	1,650
Fall	1,263	104	1,367
1988 Spring	1,505	219	1,724
Fall	—	—	—
1989 Spring	1,574	290	1,864
Fall	1,484	115	1,599
1990 Spring	1,466	214	1,680
Fall	1,516	120	1,636
1991 Spring	1,700	241	1,941
Fall	1,523	138	1,661
1992 Spring	1,810	291	2,101
Fall	1,581	134	1,715
1993 Spring	2,022	217	2,239
Fall	1,662	143	1,805
1994 Spring	2,076	283	2,359
Fall	1,730	115	1,845

In the past 20 years, however, new threats have developed that could potentially jeopardize sea otters and their habitat. These threats include possible oil spills from tanker accidents and well blow-outs, entanglement in fishing gear, and marine pollution.

Efforts by the Marine Mammal Commission and others to ensure the continued protection of sea otters and their habitat have been discussed in previous annual reports. A summary of these actions and a discussion of efforts undertaken in 1994 follows.

The Central California Population

By the time commercial hunting ceased in 1911, sea otters in California were limited to a few miles of nearshore habitat along the rocky Point Sur coast; the total population may have numbered fewer than 50 animals. Under the Fur Seal Convention and additional protective measures later implemented by the State of California, the population increased slowly. By the mid-1970s, approximately 1,800 sea otters inhabited nearshore areas along 160 miles of the central California coast. More recent population counts are shown in Table 7; the spring 1994 count of 2,359 animals continued an upward trend that began early in the 1990s.

Because of its small size and limited distribution, and the growing risk of oil spills as a result of increasing tanker traffic in the area, the population was designated as threatened under the Endangered Species Act in January 1977. It was recognized that perhaps the best way to minimize the risk of oil spills would be to encourage further expansion of the sea otters' range. However, such range expansion could impact commercial and recreational abalone and other shellfish fisheries that had developed in the absence of sea otters. In response to this realization, the Fish and Wildlife Service, acting on a December 1980 recommendation by the Marine Mammal Commission, adopted and implemented 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 present range. The zonal management concept was incorporated into the Service's Southern Sea Otter Recovery Plan adopted in February 1982.

As discussed in previous annual reports, the Fish and Wildlife Service initiated efforts in 1981 to establish a sea otter "reserve" off California. In 1986 Congress passed Public Law 99-625, which included provisions authorizing and encouraging the development and implementation of a plan to establish at least one sea otter colony outside the then-existing sea otter range in California. The law required that the plan specify a translocation zone that would meet the habitat needs of the translocated animals and provide a buffer against possible harmful activities that may occur outside the 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 to prohibit range expansion and protect fishery resources south of Point Conception. The law further specified that the management zone not infringe on the population's existing range or on adjacent range where expansion is necessary for recovery of the species.

The Fish and Wildlife Service, in consultation with the Marine Mammal Commission, the California Coastal Commission, and the California Department of Fish and Game, subsequently developed and adopted a plan to establish a reserve sea otter colony at San Nicolas Island in the California Channel Islands. Implementation of the plan required cooperative efforts by the Navy, which manages activities on San Nicolas, as well as by the Fish and Wildlife Service and the California Department of Fish and Game. To clarify their respective roles, the latter two agencies concluded a Memorandum of Understanding on 18 August 1987.

Translocation Efforts — Capture of sea otters for translocation to San Nicolas Island began on 24 August 1987. As of June 1990, 252 sea otters had been caught along the central California coast for possible translocation to San Nicolas Island. Of these, 105 were released at the capture site, 8 died during the translocation process, and 139 were transported to and released at San Nicolas Island. No animals have been captured for translocation since mid-1990.

Between August 1987, when the translocation program was initiated, and December 1993, 28 pups are known to have been born at the San Nicolas Island translocation site and 9 of these are believed to have survived to weaning. Of the 139 sea otters translocated to San Nicolas Island during that period, 14 are known to have died; 10 have been recaptured in the management zone; and 36 have been resighted back in the mainland range. The fate of the remaining animals is unknown.

During 1993 funding was reduced and opportunities to observe the San Nicolas population were limited. At least six pups were observed. However, the population did not appear to be growing and was estimated at 12-14 animals, about the same as the previous year. During 1994 population counts were conducted on a bimonthly basis. During the most recent survey in mid-December, 15 animals were seen, indicating that the sea otter population on San Nicolas has not changed.

Containment — From September 1987 through December 1993 there were more than 100 reports of sea otters within the designated management zone south of Point Conception and around the other Channel Islands. Some reports turned out to be seals and sea lions, rather than sea otters, while others were repeated sightings of the same animals. During the period, a total of 20 independent sea otters and 4 pups were captured in and removed from the management zone. Some were translocated otters and others were from the mainland population.

In the early years of the translocation, sea otters sighted in the management zone appeared to be transients, moving from place to place. Beginning in 1991, however, there were indications that animals were taking up residence in the nearshore waters of San Miguel Island. During an aerial survey in May 1991, nine adults and one pup were sighted around San Miguel Island. Since then, the Fish and Wildlife Service has captured and removed 11 independent sea otters and 3 pups from waters around that island. At the end of 1994, there were no known colonies of sea otters in the management zone.

In February 1993 two sea otters removed from the management zone by the Fish and Wildlife Service died after their release in the mainland sea otter range. As noted above, Public Law 99-625 requires that non-lethal means be used to remove sea otters from the zone. The Service was unable to determine why these

animals died and halted further removal of sea otters to allow time to evaluate the situation and determine if containment efforts were indeed non-lethal.

On 13 May 1993 the California Department of Fish and Game wrote to the Fish and Wildlife Service with regard to the Service's decision to halt its containment activities. The Department noted that since the program's inception, 26 sea otters had been captured in the management zone and relocated to the mainland range and, of these, three adult animals had died and a fourth, a pup, was missing. In the Department's opinion, no activity involving the handling of wildlife can be considered free from the risk of losing individuals, and defining lethal take to include any capture and relocation technique where a death occurs following release is unreasonable.

As discussed in Chapter II, the Marine Mammal Protection Act was reauthorized in 1988 for a five-year period. During reauthorization hearings held 4 August 1993 by the House Merchant Marine Committee's Subcommittee on Environment and Natural Resources, questions were raised regarding what would happen if the Fish and Wildlife Service declared the sea otter translocation program a failure. The questions were directed to representatives of the Commission and the National Marine Fisheries Service participating in the hearing.

In response, the Commission representative indicated that, if the San Nicolas Island translocation was determined to be a failure, the Fish and Wildlife Service would be required to use all feasible, non-lethal means to capture any animals remaining at San Nicolas Island and in the management zone and return them to the parent population. After this is done, management authority would revert to the provisions of the Endangered Species Act and the Marine Mammal Protection Act. Under the latter Act, taking from depleted species can be authorized only for purposes of enhancement and scientific research, and incidental to activities other than commercial fishing when the taking involves only small numbers and would have negligible effects. Taking to limit range expansion would be prohibited until the population is found to be within its optimum sustainable population range, or Congress authorizes taking to limit range expansion as it did in Public Law 99-625.

In December 1993 representatives of the Fish and Wildlife Service met with officials from the California Department of Fish and Game to discuss the concerns involving lethal take and other aspects of the sea otter containment and translocation program. At the end of 1994 it was the Commission's understanding that the Fish and Wildlife Service and the California Department of Fish and Game were evaluating the containment program and considering options for the future.

Incidental Take in Fisheries — When the California sea otter population was listed as threatened in January 1977, it was assumed that population size and range were increasing and would continue to increase at about five percent per year until all of the available habitat was reoccupied. As noted in previous annual reports, however, the population failed to grow as expected. Studies done by the California Department of Fish and Game and Marine Mammal Commission contractors (see Appendix B, Bishop 1985 and Jameson 1986) suggested that the lack of growth probably was due to the incidental take of sea otters in coastal gillnet fisheries. The studies also indicated that other marine mammals and thousands of seabirds and non-target fish species also were being caught and killed in these fisheries.

The State of California, recognizing the problems being caused by these non-selective fishing practices, enacted a series of regulations starting in 1982 to prohibit the use of gill and trammel nets in areas where seabirds, sea otters, and other marine mammals were likely to become entangled. The prohibitions have reduced the incidental take of sea otters and, as shown in Table 7, subsequent counts suggest that the population increase and range expansion have resumed. The restrictions did not, however, eliminate the incidental entanglement of sea otters. Therefore, in 1990 the State of California enacted legislation prohibiting use of gill and trammel nets in waters shallower than 30 fathoms throughout most of the sea otter range in the State.

As noted earlier, the sea otter population on San Nicolas Island does not appear to be growing, despite evidence of pups being born into the colony. The reason for this lack of growth is not known. One possibility is that sea otters are being caught and killed in lobster traps.

Sea Otter Necropsy Program —Through an agreement reached in 1991 between the Fish and Wildlife Service and the California Department of Fish and Game, veterinary pathologists with the National Biological Service's National Wildlife Health and Research Center in Madison, Wisconsin, have been conducting necropsies on all fresh beach-cast sea otter carcasses collected along the California coast. The program is scheduled to continue through 1994.

On 28-29 April 1994 a meeting was held at the Monterey Bay Aquarium to review the results of the necropsy program. Data from carcasses examined from January 1992 through March 1994 indicated that infectious disease was the cause of death in 40 percent of the animals. Other documented causes of mortality included traumatic injuries (18 percent), emaciation from unknown causes (11 percent), miscellaneous obstructions or functional disorders (10 percent), and tumors (3 percent). The cause of death was undetermined for the remaining sea otter carcasses examined.

The high rate of infectious disease in the necropsied animals had led to concern that the immune systems of southern sea otters are being suppressed. To investigate this further, researchers at the University of California at Davis will begin a study in 1995 of immune responses in sea otters using tissues taken from the same beach-cast animals being examined by the Madison laboratory.

Update of the Southern Sea Otter Recovery Plan — In 1989 the Fish and Wildlife Service reconstituted the Southern Sea Otter Recovery Team to review and recommend changes necessary to update the Southern Sea Otter Recovery Plan. This action was precipitated, in part, by the *Exxon Valdez* oil spill that occurred in Prince William Sound, Alaska, in March 1989. The *Exxon Valdez* oil spill affected an area larger than the sea otter range in California and demonstrated that the entire California sea otter population could be jeopardized by a single large oil spill.

The recovery team reviewed and subsequently recommended revision of the recovery plan. In response to the team's recommendations, the Fish and Wildlife Service drafted a revised plan and in August 1991 provided it to the Commission and others for review and comment. The Commission, in consultation with its Committee of Scientific Advisors, reviewed the draft revision and provided comments to the Service by letter of 8 November 1991. As discussed in the previous annual report, the Commission noted that the draft revision contained conclusions that were not adequately supported by the information and analyses. The Commission recommended that a second draft be done and be provided to the Commission and others for review and comment before it was considered for adoption by the Service.

Receiving no response to its 8 November 1991 letter and recommendations, the Commission on 11 May 1992 again wrote to the Service. It noted that since it had not been advised otherwise, the Commission assumed that the Service was preparing a second draft of the proposed recovery plan revision, as recommended. In its letter, the Commission requested that if this was not the case, the Service immediately advise the Commission, as required by section 202(d) of the Marine Mammal Protection Act, as to why it had not followed the recommendation.

On 8 July 1992 the Service advised the Commission that it had decided not to prepare a second draft for further agency and public review. The Service noted that comments on the first draft had identified a number of points that were not clear or adequately justified and that the principal problem had been caused by the recovery team's attempt to combine the recovery goals of the Endangered Species Act and the Marine Mammal Protection Act. The Service indicated that the recovery team had reviewed the comments on the draft recovery plan revision and had proposed to redirect the focus of the revision specifically to actions needed to remove the population from the List of Endangered and Threatened Species.

Subsequently a number of industry and conservation groups expressed concern to the Fish and Wildlife Service that revision of the recovery plan was being done without public input and consideration of socioeconomic factors. In response to these concerns, early in 1993 the Fish and Wildlife Service formed a public interest group to identify and suggest ways for resolving conflicting views regarding needed conservation actions. The group includes representatives of the State of California, the fishing industry, the oil industry, and environmental groups. The group met

twice during 1993 in conjunction with meetings of the recovery team.

During 1994 work was completed on an oil spill risk modeling study carried out under contract from the Fish and Wildlife Service. The results were considered at a meeting of the Southern Sea Otter Recovery Team held 17-18 December 1994.

At the end of 1994 a revised draft of the updated recovery plan was being circulated to recovery team members for review. It was the Commission's understanding that the revision focuses on actions needed to meet recovery goals under the Endangered Species Act, eliminating consideration of the Marine Mammal Protection Act that had been part of an earlier draft. It was expected that the revised draft would be submitted to the Service's Regional Director in February 1995.

The Washington Sea Otter Population

As noted above, sea otters historically ranged along the North Pacific coast of the United States and Canada from the Pribilof Islands in the north to California in the south. During the 18th and 19th centuries, the species was extirpated from most of its range. Between 1965 and 1972, Federal and state agencies cooperated in a project to translocate sea otters from Alaska to parts of the species' former range. As part of this effort, in 1969 and 1970, 59 animals were translocated and released in waters off the State of Washington. In 1994 it was estimated that the population numbered about 400 individuals occupying a small range off remote portions of the Olympic Peninsula. The population is thought to be growing at a rate of 15 to 20 percent annually and within the next decade could expand into waters supporting active shellfish and set-net fisheries. Based on experience with sea otters in Alaska and California, it can be anticipated that this expansion will lead to conflicts between sea otters and fisheries. In order to get a handle on the potential problem, the Marine Mammal Commission provided support for an assessment of potential fisheries conflicts. This is discussed in detail in Chapter XI.

The Alaska Sea Otter Population

Small groups of sea otters survived the era of commercial exploitation in several remote areas of Alaska. Since then, sea otters have repopulated most of their former range in Alaska although they have not yet reached carrying capacity in some areas. No sea otters survived in southeast Alaska, and repopulation of the area was initiated by translocating otters from Amchitka Island and Prince William Sound in the late 1960s and early 1970s.

The best available data indicate that there currently are 100,000 to 150,000 sea otters in Alaska. Although the population is large and growing, there are a number of existing and foreseeable threats and conservation issues. These include (1) conflicts with commercial, subsistence, and recreational shellfish fisheries that have developed in the absence of sea otters; (2) incidental take in gillnet and other fisheries; (3) oil and gas development and transportation; (4) logging, mariculture, and other coastal development; (5) Native subsistence hunting; and (6) the increasing tourist industry in Alaska. The reality of oil and gas-related threats is illustrated by the 1989 *Exxon Valdez* oil spill, which is estimated to have directly killed between 3,500 and 5,500 sea otters. In some areas, oil contamination may still be affecting sea otters and their habitat.

Recognizing the threats and possible conflicts being generated by increasing human populations and development in Alaska, the Commission in 1984 initiated efforts to assess the state of knowledge and identify conservation issues regarding sea otters and nine other species of marine mammals that occur commonly in Alaska waters. This effort led to the publication in 1988 of species accounts, with research and management recommendations, for each of the ten species (see Appendix B, Lentfer 1988).

As noted in previous annual reports, the Marine Mammal Commission suggested to the Fish and Wildlife Service in January 1989 that the Service prepare conservation plans for walruses, polar bears, and sea otters using the above-noted species accounts as source documents. The Service concurred with the Commission's suggestion, but its efforts to develop the conservation plans were delayed by the necessity

of diverting personnel to deal with the *Exxon Valdez* oil spill.

Realizing that continuing damage assessment and restoration activities related to the oil spill would further delay plan preparation, the Commission offered in 1991 to provide assistance by developing draft plans. The Service accepted the offer, and the Commission subsequently prepared and on 4 May 1992 forwarded a draft sea otter conservation plan to the Service.

The Service's Alaska Regional Office reviewed and revised the working drafts of the sea otter, walrus, and polar bear conservation plans provided by the Commission. In January 1993 it distributed the revised drafts for public review and comment. At the same time, the Service transmitted questionnaires seeking views concerning related research and management issues.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the draft plans, and by letter of 23 March 1993 forwarded its comments to the Service. The Commission noted that the drafts raised a number of points that needed to be addressed before the plans were adopted.

The Commission also noted that in some cases the stated goals of the plans appeared to differ substantially from the Marine Mammal Protection Act's goal of preventing marine mammal populations from being reduced or maintained below their optimum sustainable level. For example, the draft sea otter plan stated that the Service's goal was "to maintain the sea otter stock in Alaska within its OSP range and to maintain healthy sub-populations of sea otters regionally in Alaska."

In mid-April 1993 the Commission was advised informally that the Service planned to finalize and adopt its polar bear, walrus, and sea otter conservation/management plans without further consultation. By letter of 20 April 1993, the Commission advised the Service that such an action would diminish the likelihood that the Service's plans would be accepted by those who would be affected by the various provisions. Thus, the Commission recommended that the Service provide an opportunity for additional review and revision before adopting the plans.

The Service concurred with the Commission and on 3 May 1993 forwarded its final draft management plans for the polar bear, walrus, and sea otter in Alaska to the Commission and others for review and comment. The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the final drafts and on 24 June forwarded comments to the Service. The Commission noted that all three plans were much improved over earlier drafts and, with relatively minor revision, could be put into final form and used to guide future research and management activities.

The Commission noted that all three draft plans called for amendment of the Marine Mammal Protection Act to give the Service authority to regulate Native hunting if it appeared that such hunting, by itself or with other activities, was causing a species or population to be reduced or maintained below its maximum net productivity level. The Commission pointed out that the proposal suggested, but provided little justification for concluding, that present levels of taking were insufficient to meet Native subsistence and handicraft needs; some taking is being done for commercial rather than subsistence or handicraft purposes; the level of take inevitably will increase; the Natives themselves will be unable to prevent the take from reaching levels that will deplete the affected populations; and/or there is a substantial risk to populations from other sources — *e.g.*, oil and gas exploration and development — and the Service will be unable to meet its responsibilities under the Marine Mammal Protection Act unless it has authority to regulate all forms of taking in emergency situations.

The Commission agreed that it would be irresponsible to delay regulation of Native subsistence hunting or any other type of taking until the affected species or population stock is formally designated as depleted. The Commission pointed out, as noted above, that the basis for the Service's concerns, and precisely when and how it would propose exercising emergency regulatory authority, were not clear. The Commission suggested that as a first step the Service work with the affected Native groups and the State of Alaska to describe and reach agreement on situations where

emergency management authority would be required to effectively meet the intents and provisions of the Marine Mammal Protection Act, and what that authority should entail.

By October 1993 the Service had not responded to the Commission's 24 June comments on the final draft plans, and on 20 October the Commission wrote to the Service asking to be advised of the present status of the plans. It also asked what changes had been or would be made in response to comments from various parties, what steps the Service had taken or planned to implement key provisions of the plans, and what levels of funding were to be applied to each plan on a task-by-task basis.

On 10 November the Service responded to the Commission's 20 October letter, noting that publication of the final plans was anticipated by mid-December and that the plans would identify research and management needs and priorities and provide estimated costs and timetables for specific tasks. The Service noted that implementation of key provisions of the final plans would be dependent on funds appropriated to the Fish and Wildlife Service and the National Biological Survey.

On 8 December 1993 the Service forwarded revised drafts of the conservation plans for polar bears, sea otters, and Pacific walruses to the Commission and others who had been involved in plan development. In the accompanying letter, the Service noted that all three plans had undergone substantial revision in light of comments received and the direction provided by the new Administration. The Service further noted that the revised drafts placed greater emphasis on development of co-management programs with the various Alaska Native organizations that deal with marine mammal conservation. Because of the change in emphasis, the Service concluded that it was no longer appropriate to refer to the plans as management plans and that they were now being called conservation plans.

Development of a Co-Management Plan

In December 1988, Alaska Natives formed the Alaska Sea Otter Commission to promote Native participation in development of Federal and state policies affecting sea otters and their use in Alaska. The Commission is comprised of representatives from Alaska coastal regions where sea otters occur. The Marine Mammal Commission consulted and incorporated the view of the Alaska Sea Otter Commission in the draft sea otter conservation plan prepared by the Commission and provided to the Fish and Wildlife Service on 5 May 1992.

To facilitate Native involvement in developing and implementing an agreed sea otter conservation plan, the Alaska Sea Otter Commission drafted and in 1991 proposed that the Fish and Wildlife Service, the Alaska Department of Fish and Game, and the Sea Otter Commission enter into a formal Memorandum of Agreement specifying their respective responsibilities related to the conservation of sea otters in Alaska. The Sea Otter Commission also began development of regional sea otter management plans to complement the statewide sea otter conservation plan being developed by the Fish and Wildlife Service.

A Memorandum of Agreement satisfactory to all three parties was signed on 1 February 1994 by representatives of the Fish and Wildlife Service, the Alaska Department of Fish and Game, and the Alaska Sea Otter Commission. The purpose of the agreement is to assist signatories in the cooperative management of sea otters in Alaska by providing for the exchange of biological, management, and socioeconomic information, and for support of the requirements of pertinent laws, regulations, and resolutions. Further, in 1994 the Sea Otter Commission completed draft management plans for sea otters in the Chugach (Prince William Sound), southeast, and Kodiak regions. Final plans for these three regions, and the Bristol Bay, Cook Inlet, and Aleutian-Pribilof regions are expected to be completed by December 1995.

CITES Permit Request — The Convention on International Trade in Endangered Species of Fauna and Flora (CITES) requires that before species listed on Appendix I or II may be exported, a permit must be obtained. The responsible government agency may issue a permit only if it determines that the specimen was acquired lawfully and that the proposed export would not be detrimental to the species' survival.

On 1 April 1994, Kuiu Kwan Inc., of Lynnwood, Washington, applied to the Fish and Wildlife Service for a permit to export to several foreign countries (Japan, Taiwan, Hong Kong, and Canada) three sea otter pelts decorated with Alaska Native artwork. The pelts were to serve as product samples to determine if a foreign market existed for painted pelts.

By *Federal Register* notice of 31 May 1994 the Service announced receipt of the permit application and requested comments from interested parties. By letter of 2 June 1994 the Service forwarded copies of the permit request to the Marine Mammal Commission for review and comment. In its letter the Service noted that the proposed export could raise questions as to what constitutes an authentic Native handicraft under the Marine Mammal Protection Act and applicable regulations. The Service also noted that the decision on this permit request may set a precedent for similar activities in the future.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the permit application, and by letter of 14 July 1995 provided comments to the Service. In its letter the Commission noted that a decision on whether to issue a CITES export permit is to be based on three criteria, only two of which would apply in the Kuiu Kwan case. These are whether the proposed export would be detrimental to the survival of the species and whether the wildlife was acquired lawfully.

In the Commission's opinion, the export of pelts from three animals would not be detrimental to the survival of the Alaska sea otter population or any subpopulation. The Commission noted, however, that the export of the pelts would be merely a prelude to further exports, should a foreign market be developed. According to the Alaska Sea Otter Commission, the permit applicant was responsible for taking approximately one-fourth of the record high number of sea otters taken by Alaska Natives in 1993. The take was primarily from the same general area and may have been greater than the local population or subpopulation can sustain. Therefore, the Commission noted that if an export permit is issued, the Service should advise the permittee that making future findings of "no detriment" may be difficult for any large-scale commerce in sea otter pelts that may result.

With regard to the second criterion, that the animals be lawfully acquired, the Commission noted that this requirement may or may not have been met in this instance — the crucial issue being whether painted sea otter pelts constitute "authentic Native articles of handicrafts" as defined in the Marine Mammal Protection Act. Specifically, the issue is whether the painted pelts meet the regulatory requirement that exports be "significantly altered from their natural form." Citing a lack of explanation for this requirement in the rulemaking record, the Commission suggested that the "significantly altered" requirement could have been included to help ensure that marine mammal parts sold as handicraft were not subsequently transformed into other items. If so, the pelts for which a permit was being sought probably do not meet the regulatory definition of an authentic Native handicraft article. The Commission therefore recommended that the Service review the rationale behind the requirement that Native handicrafts be significantly altered and, depending on the results of this review, examine the pelts held by the applicant to determine whether they could be readily transformed into other saleable items.

A related concern is the regulatory requirement that improved methods of producing handicrafts be allowed only if no large-scale mass production results. This could be a potential problem if foreign markets are developed for painted pelts.

The Commission also noted that the 1994 amendments to the Marine Mammal Protection Act prohibit export of any marine mammal or marine mammal product taken in violation of the Act or for any purpose other than public display, scientific research, or enhancement of the species or stock. The proposed export is not for one of these enumerated purposes and, unless one of the other exceptions set forth in the Act applies, would constitute a violation of the Act. The Commission therefore recommended that the Service review the exceptions noted in section 102(a) to determine whether any provides authority for the proposed export.

On 6 October 1994 the Service wrote to the petitioner denying the request to export and re-import three sea otter pelts. It stated that the Service had been unable to determine that the export would not be

detrimental to the survival of the species. While export of just three pelts may not in itself adversely affect the northern sea otter population, other factors must be considered. For instance, the specimens were taken as part of a total harvest that may not be biologically sustainable at the local population level. In addition, the take of sea otters may increase substantially if approval of the proposed export leads to an increase in foreign markets for sea otter products. In fact, as discussed in Chapter IX, the sea otter harvest already has increased substantially following a court ruling that invalidated regulations that had excluded the use of sea otters in making handicrafts.

As a third reason, the Service noted that there is "a lack of adequate control on sea otter harvest to prevent over-exploitation of local populations." Although Native groups are currently developing regional management plans in conjunction with local communities, management plans currently lack adequate enforcement of harvest limits.

The Service also concluded that the pelts did not qualify as Native articles of handicrafts and were not significantly altered from their natural form. The pelts are still whole, the fur side is unmarred and intact and has not been modified to such an extent as to preclude subsequent alteration (*e.g.*, sewing a fabric lining on the tanned side for resale as tanned pelts). The Service further noted that, if the petitioner's intent was to market Native paintings, rather than sea otter pelts or handicrafts, a different substrate could be used.

Also, the Marine Mammal Protection Act stipulates that "no large scale mass production industry can result." The Service questioned whether the intended broad activities described in the permit application (developing a foreign market and organizing Natives throughout Alaska to provide skins and handicrafts to the foreign markets) would appear to be beyond the intent of the Act.

On 8 November 1994 Kuiu Kwan Inc. wrote to the Service seeking reconsideration of the decision to deny the permit. In its letter the petitioner alleged that the Service was improperly seeking to protect sea otters from possible Native Alaska over-harvesting by means which are contrary both to the Marine Mammal Protection Act and the Service's own regulations. The petitioner noted that there are only two legal bases for denying a permit request under CITES: (1) the subject wildlife was not lawfully taken or (2) the proposed export activity would be detrimental to the survival of the species. The petitioner argued that the Service had no facts to support a finding that the proposed export activity would be detrimental. Indeed, the petitioner noted, the denial is based on the Service's inability to find that the proposed activity would not be detrimental.

The Service's alternative ground for denial — that the proposed export would violate certain requirements of the Marine Mammal Protection Act that limit sale in commerce only to "authentic Native handicrafts" — was also challenged by the petitioner. The petitioner argued that, because the proposed export activity specifically excludes any sale in commerce, it could not possibly result in a violation of the Act. The petitioner also disputed the Service's conclusion that the pelts are not significantly altered from their dressed form, and questioned the basis for the Service's speculation that a non-Native purchaser of the handicrafts might subsequently alter the decorated pelts. The petitioner argued that this a "significant alteration" determination must be made at the time when the Native Alaskan maker offers his handicraft for sale in commerce, not at some undetermined future time after the Native Alaskan has already sold his handicraft.

The petitioner further stated his intent to appeal to the director and then, if need be, to file suit in federal district court and asked for prompt consideration of the request (sooner than the 45 days allowed).

Sea Otter Stock Assessments

As discussed in Chapter V, the 1994 amendments to the Marine Mammal Protection Act directed the Secretaries of Commerce and the Interior to prepare marine mammal stock assessments to serve as the scientific basis for a new regime governing the taking of marine mammals incidental to commercial fisheries. On 15 August 1994 the Fish and Wildlife Service distributed to the Marine Mammal Commission and others draft stock assessments for marine mammal populations under its jurisdiction, including sea otter

stocks in California, Washington, and Alaska. The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the drafts and by letter of 1 December 1994 provided comments to the Service.

In its letter, the Commission noted that the draft assessments generally provided complete and concise summaries of available information concerning the distribution and status of the stocks and the levels of human-related mortality and injury. With regard to the Alaska sea otter stock, the draft indicated the number of sea otters taken since 1988 by Alaska Natives as reported through a mandatory marking and tagging program. However, the Commission noted that the draft did not indicate the areas in which the animals were taken or the estimated sea otter abundance in the areas. Consequently, the Commission noted, it was not possible to assess the effects of the Native take on local and regional sea otter populations in Alaska. The Commission further noted that the draft assessment did not identify all the human activities identified in the Conservation Plan for the Sea Otter in Alaska that may affect the long-term conservation of sea otters and their habitat. Neither did the draft mention the ongoing efforts by Alaska Natives to develop and implement regional plans for regulating hunting of sea otters for subsistence and handicraft purposes. Accordingly, the Commission recommended that the stock assessment for sea otters in Alaska be revised and expanded to include abundance, trends, and levels of subsistence take and human-related threats to sea otters in specific geographic areas.

With regard to the Washington stock of sea otters, the Commission noted that the draft assessment provided a clear and succinct summary of available information on the stock. In the Commission's opinion, however, it could be improved by (1) indicating the number and sources of animals translocated to Washington in 1969 and 1970, (2) providing or describing the data used to determine that the population currently is growing at an average rate of 12 percent per year, (3) noting where the one recorded case of a sea otter-fishery interaction occurred in Washington, and (4) indicating the present distributions of sea otters and gillnet fisheries in Washington coastal waters.

With regard to the California stock of southern sea otters, the Commission noted that the draft assessment should be revised to note that (1) in 1977 the population was designated as threatened under the Endangered Species Act because of its small size, limited distribution, vulnerability to oil spills, and the increasing risk of oil spills and other catastrophic events in its range; (2) a recovery plan has been developed and presently is being updated; (3) as part of the recovery effort the Fish and Wildlife Service has attempted to establish a reserve breeding colony at San Nicolas Island; (4) legislative authority for translocation of sea otters from the mainland to San Nicholas Island specified that the area surrounding the translocation zone be designated as a management zone, from which sea otters are to be excluded by non-lethal means; (5) a number of otters have entered the management zone and have died or may have died as a consequence of efforts to capture and remove them; and (6) an uncertain number of sea otters may have been killed in recent years by small oil spills and unusual diseases.

The Commission further noted that the number of otters caught and killed in gill and trammel net fisheries before 1985, when such fisheries were prohibited in most of the California sea otter range, were far above either of the possible estimates of the potential biological removal level. The Commission pointed out that, if the restrictions on use of gill and trammel nets were lifted, the southern sea otter population would be designated as a strategic stock and a take reduction team would have to be established to advise on measures that should be taken to ensure that the take of sea otters does not exceed the calculated potential biological removal level.

At the end of 1994 the Service was reviewing comments by the Commission and others and had not yet finalized its stock assessment reports.

Chapter V

MARINE MAMMAL–FISHERIES INTERACTIONS

Marine mammals 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 after becoming entangled in fishing gear; and they may compete with fishermen for the same fish and shellfish resources.

In 1988 the Marine Mammal Protection Act was amended to establish a five-year interim exemption to govern the taking of marine mammals incidental to commercial fisheries other than the eastern tropical Pacific tuna fishery. A new regime to govern fisheries-related incidental take was enacted in 1994. It is to replace the interim exemption on or before 1 September 1995.

With respect to the eastern tropical Pacific tuna fishery, incidental taking of marine mammals continues to be regulated under a general permit issued in 1980 to the American Tunaboat Association. Inasmuch as no major tuna-fishing nation has committed to a global moratorium on the practice of catching tuna by setting on marine mammals, that permit will continue in force until 1999. The allowable incidental mortality under that permit, however, is to be reduced each year.

Actions taken with respect to implementation of the 1994 amendments regarding commercial fisheries take of marine mammals and the eastern tropical Pacific tuna fishery are discussed below. Also discussed are ongoing efforts to determine and address the causes of recent changes in the structure of the Bering Sea and Gulf of Alaska ecosystems and statutory requirements to assess factors affecting the Gulf of Maine ecosystem. This chapter also provides information on efforts to establish pinniped-fishery interaction task forces, as required under the 1994 amendments, and a final section discusses a 1993 ruling in a fisheries-related prosecution under the Marine Mammal Protection Act that was largely supplanted by the enactment of a statutory definition of harassment. Fishery interactions affecting Hawaiian monk seals, Steller sea lions, harbor seals in Alaska, harbor porpoises, killer whales, vaquitas, right whales, and sea otters are discussed in Chapter IV.

Marine Mammal Protection Act Amendments of 1994

As discussed in Chapter II and in Appendix D, significant changes to the Marine Mammal Protection Act provisions concerning marine mammal-fishery interactions were enacted in 1994. Among other things, three new sections were added to the Act to address such interactions. New section 117 requires the preparation of marine mammal stock assessments to constitute the scientific basis for the new regime to govern the taking of marine mammals incidental to commercial fisheries. New section 118 sets forth the requirements of a new incidental take regime which will replace the interim exemption in 1995. The new regime focuses priority on reducing the incidental mortality and serious injury of marine mammals from strategic stocks — *i.e.*, those that are listed as endangered or threatened under the Endangered Species Act or declining and likely to be listed in the foreseeable future, those designated as depleted under the Marine Mammal Protection Act, and those for which human-caused mortality exceeds the estimated replacement yield. Actions taken to implement these provisions are discussed in this section of the annual report.

New section 120 calls on the Secretary of Commerce to assess pinniped-fishery interactions and provides a mechanism for authorizing the lethal

removal of individual pinnipeds that are adversely affecting certain salmonid stocks, without obtaining a waiver of the Act's moratorium on taking. Implementation of section 120 is described in the last section in this chapter.

Stock Assessments

Section 117 required the Secretary of Commerce by 29 June 1994 to establish three regional scientific review groups consisting of individuals with expertise in marine mammal biology and ecology, population dynamics and modeling, commercial fishing technology and practices, and stocks taken by Alaska Natives for subsistence and handicraft purposes to assist in the preparation of a draft stock assessment for each marine mammal stock that occurs in waters subject to the jurisdiction of the United States. The Secretary was to appoint regional groups for Alaska, the Pacific Coast, including Hawaii, and the Atlantic Coast, including the Gulf of Mexico, after consultations with the Secretary of the Interior, the Marine Mammal Commission, the Governors of the affected States, regional fish and wildlife management authorities, Alaska Native organizations and Indian tribes, and environmental and fisheries groups. Among other things, the regional scientific review groups are to advise the Secretary on (1) the estimated size, status, and trends of marine mammal stocks; (2) uncertainties regarding stock separation, abundance, and trends, and research needed to resolve those uncertainties; (3) uncertainties and needed research regarding the species, numbers, ages, gender, and reproductive status of marine mammals; (4) research needed to identify modifications in fishing gear and practices likely to reduce the incidental mortality and serious injury of marine mammals; and (5) the actual, expected, or potential impacts of habitat destruction on marine mammals and, for strategic stocks, conservation or management measures to reduce such impacts.

By 1 August 1994 the Secretary, in consultation with the appropriate regional scientific review group, was to prepare a draft stock assessment for each of the stocks. The draft stock assessments were to be made available for a 90-day public comment period. Within 90 days of the close of the public comment period, the Secretary was to issue a final stock assessment and publish a summary of it in the *Federal Register*. Each stock assessment was to (1) describe the geographic range of the stock; (2) provide a minimum population estimate, the stock's current and maximum net productivity rates, and current population trend, including a description of the information upon which these are based; (3) estimate the annual human-caused mortality and serious injury, by source, and, for stocks determined to be strategic stocks, describe other factors that may be causing a decline or impeding recovery; (4) describe the commercial fisheries that interact with the stock, including an estimate of the number of vessels in each fishery, fishery-specific estimates of mortality and serious injury levels and rates, a description of seasonal or area differences in incidental mortality and serious injury, and an analysis of whether incidental take levels are approaching a zero mortality and serious injury rate; (5) assess whether the level of human-caused mortality and serious injury is not likely to cause the stock to be reduced below its optimum sustainable population or, alternatively, whether the stock should be categorized as a strategic stock; and (6) estimate the potential biological removal level for the stock and describe the information used to calculate it.

Stock assessments are to be reviewed at least annually for strategic stocks and at least once every three years for other stocks. An exception to the generally applicable timing requirements was included for stocks subject to taking by Alaska Natives. If requested by an Alaska Native covered by the Act's Native exemption, the Secretary must conduct a formal adjudicatory hearing to examine the information contained in the draft assessment prior to publishing a final stock assessment or any revision of a final stock assessment.

The amendments to the Marine Mammal Protection Act define the term "potential biological removal level" to mean:

> "the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. The potential biological removal level is the product of the following factors:

(A) the minimum population estimate of the stock.

(B) one-half the maximum theoretical or estimated net productivity rate of the stock at a small population size.

(C) a recovery factor of between 0.1 and 1.0."

Noting that this definition provided only limited guidance, the National Marine Fisheries Service, in preparation for drafting the stock assessments, convened a workshop of scientists from the Service, the Fish and Wildlife Service, and the Marine Mammal Commission to review how potential biological removal levels should be calculated. Workshop participants were asked to develop clear and consistent criteria, and where possible quantitative criteria, for making the calculations. The workshop was held at the Southwest Fisheries Science Center in La Jolla, California, on 27-29 June.

Workshop participants recommended additional criteria for each of the elements of the potential biological removal calculation. The workshop participants agreed that, for the minimum population estimate, the 20th percentile of a log-normal distribution based on an estimate of the number of animals in a stock should be used. The workshop also noted that, when data were available, a direct count of the animals in a population could be used. Participants noted the need to update abundance estimates frequently, not only to keep potential biological removal estimates current, but also as a means of detecting failures of the potential biological removal approach. They therefore recommended that calculated potential biological removal values be decreased by 20 percent per year when minimum population estimates are more than five years old. That is, if population estimates are not updated, the potential biological removal level would decrease to zero ten years after the last abundance estimate.

The workshop participants proposed that default values be used for the maximum net productivity rate (R_{max}) in the absence of stock-specific, measured values. The default values recommended were 0.12 for pinnipeds and sea otters and 0.04 for cetaceans and manatees. When reasonably reliable information regarding the maximum net productivity rate of a particular stock is available, the workshop anticipated that this would be used in place of the default values.

With respect to the recovery factors, workshop participants recommended different values depending on the status of the stock: 0.1 for endangered species; 0.5 for threatened or depleted pinnipeds; and 0.65 for threatened or depleted cetaceans. For stocks known to be within their optimum sustainable population range or known to be increasing in the presence of takes greater than the calculated potential biological removal, participants agreed that higher values, up to and including 1.0, could be used for the recovery factor. For stocks of unknown status, the group agreed that the recovery factor should be selected such that the stock, if at its optimal level, would be maintained within that level with at least a 95 percent probability and, if at the lower bound of its optimal level, would still be within its optimum sustainable population after 20 years, with a 95 percent probability. Based on these criteria, workshop participants recommended that the recovery factors for threatened and depleted stocks also be used for stocks of unknown status.

The workshop also examined the goal set forth in section 118 of the Act that incidental mortality and serious injury of marine mammals incidental to commercial fishing operations be reduced to "insignificant levels approaching a zero mortality and serious injury rate within 7 years...." Participants agreed that mortality and serious injury would be insignificant to a stock if it were only a small portion of the potential biological removal level. It was suggested that 10 percent of the potential biological removal level might be an appropriate value for determining insignificance. A fishery-by-fishery analysis of the significance of incidental take levels was beyond the scope of the preliminary stock assessments.

Workshop participants also looked at how stocks should be defined. They recommended that stocks initially be defined based on the smallest divisible unit approaching that of the area of take unless evidence of smaller subdivisions exists. Similarly, the participants noted that a risk-averse strategy requires that small stock groupings be "lumped" only when there is a compelling reason to do so.

The National Marine Fisheries Service on 30 June 1994 established the three regional scientific review groups called for in section 117. Each consists of 10 to 11 individuals and represents a range of scientific disciplines. Because of the tight schedule for publishing draft stock assessment reports, the regional scientific review groups were not able to meet before the reports were made available to the public. Draft reports were, however, provided to individual members for preliminary review before release.

By *Federal Register* notice of 9 August the National Marine Fisheries Service announced the availability of and requested comments on the draft stock assessments for marine mammals under its jurisdiction. That notice also summarized the findings of the potential biological removal workshop and solicited comments on the workshop recommendations. On 23 August the Fish and Wildlife Service published a *Federal Register* notice announcing the availability of draft stock assessments for the eight marine mammal stocks under its jurisdiction.

The first meetings of the regional scientific review groups were held jointly on 12-13 October 1994. At the joint meeting the groups were organized, the advisory role of the groups was reviewed, and comments on the proposed process for calculating potential biological removal levels were sought. With respect to potential biological removal calculations, the scientific review groups generally believed that the recommendations from the June workshop were well-founded and reasonably conservative. Concern was expressed, however, that the process could erroneously identify certain stocks as strategic stocks simply because statistically reliable abundance estimates are not available. The scientific review groups therefore recommended that the process for calculating potential biological removal levels should remain flexible to enable other information, including the use of population indices rather than abundance estimates, to be considered for specific stocks in specific regions.

The scientific review groups also took issue with the workshop suggestion that minimum population estimates be reduced by 20 percent per year when abundance data were more than five years old. While the groups agreed that a more conservative approach should be used when data were old and unreliable, they thought that ratcheting estimates down according to some arbitrary schedule was not scientifically acceptable. The groups recommended that, if a ratcheting mechanism is used, it should apply to the recovery factor rather than the minimum population estimate and should be based on a more rational approach.

The scientific groups also commented on the workshop's proposed approaches for determining a stock's maximum net productivity rate and for assigning recovery factors. The groups believed the suggested default productivity values to be appropriate where no other information exists, but noted that, because different populations of the same species can have different net productivity rates, measurements of actual population trends are preferable. The groups also supported the use of recovery factors to compensate for uncertainty and possible unknown estimation errors. They were nevertheless concerned that using the proposed fixed values could cause major changes in the potential biological removal level, and could have drastic effects on commercial fisheries, if a stock's status changes. It was noted, for example that, if Steller sea lions were reclassified from threatened to endangered, the potential biological removal level would be reduced by 80 percent without any scientific evidence to support such a reduction in allowable take.

The scientific review groups also took issue with an earlier suggestion from the National Marine Fisheries Service that, absent any information regarding a stock's status, a stock be classified as a strategic stock. The scientific review groups recommended that such determinations not be made categorically for stocks taken for Native subsistence.

With respect to the workshop's recommendations concerning the zero mortality rate goal, the scientific review groups could not reach consensus. Some members believed that fisheries-related mortality of less than 10 percent of the potential biological removal level would be negligible. Others thought that 10 percent was appropriate in some instances, but not others. They noted that if fisheries take were large, 10 percent of the potential biological removal level would not necessarily be negligible.

In addition to commenting on the workshop report, the scientific review groups made three recommendations for additional research regarding the criteria and procedures proposed to estimate biologically acceptable catch levels. They recommended that the Service undertake research directed at (1) the use of alternative population models for calculating potential biological removal levels and for robustness trials, (2) incorporating stochastic and age/sex variables into the potential biological removal calculations, and (3) exploring the potential effects of presumed single-species takes on multispecies populations (*e.g.*, beaked whales).

At the end of 1994 the National Marine Fisheries Service was revising its guidelines for stock assessment reports to take into account the comments provided by the scientific review groups. It is expected that the revised guidelines will clarify that the process for calculating potential biological removal levels should retain a certain degree of flexibility to allow modifications on a case-by-case basis when scientifically justified. The Service expects to publish revised guidelines along with the final stock assessments.

By letter of 1 December 1994 to the National Marine Fisheries Service, the Marine Mammal Commission commented on the report of the potential biological removal workshop and on the draft assessments for marine mammal stocks in Alaska, Hawaii, Washington, Oregon, and California. The Commission provided comments on the draft assessments for marine mammal stocks found in waters off the east coast and Gulf states by letter of 12 December.

The Commission noted that the draft stock assessments varied in completeness and quality. Few provided the required descriptions of the commercial fisheries that interact with the stock or the required incidental take data. None described the critical uncertainties concerning the discreteness and status of the stock, or the sources and levels of non-natural mortality, and the research that would be required to resolve those uncertainties. Also, none of the assessments provided age or sex-specific take data or noted that the impact of incidental take may vary depending not only on the numbers of animals taken, but on the age, sex, and reproductive status of those animals.

The 1994 amendments specify that the stock assessments are to be based upon the best scientific information available. The Commission noted, however, that some of the draft stock assessments reference or rely on old data. The Commission therefore recommended that, before finalizing the stock assessments, the Service identify and consult with scientists currently conducting marine mammal research in U.S. waters to ensure that the assessments have factored in the most up-to-date information.

The Commission observed that the general rules for calculating potential biological removal levels recommended by the workshop are useful and appropriate for many, but not all, situations. The Commission noted that reducing the estimated potential biological removal level by 20 percent per year when minimum population estimates are more than five years old may lead to senseless results in some instances. For example, although there are neither reliable nor up-to-date population estimates for Arctic ice seals, there is no reason to believe that the stocks have been or are likely to be subjected to levels of take that would cause them to be reduced or maintained below their optimum sustainable population levels in the foreseeable future. In the Commission's view, little of practical value could be achieved by investing the money and logistic support that would be required to obtain and periodically update reliable estimates of minimum population size for these stocks. In cases where the minimum population size cannot be estimated reasonably, the Commission thought it preferable to indicate that the potential biological removal level is uncertain, rather than to provide what is clearly a gross underestimate. The Commission concluded that uncertainty as to the potential biological removal level should not, by itself, be a sufficient basis for classifying stocks as strategic stocks.

The Commission also questioned the advisability of using the recommended default values for the maximum theoretical net productivity rate to calculate the potential biological removal level for species or stocks, such as the Hawaiian monk seal, where the species or population stock is endangered and continuing to decline for reasons which are not clearly human-caused. In such cases, there is no reason to believe that limiting known sources of human-caused mortality and injury to the potential biological

removal level calculated using the maximum theoretical net productivity rate would stop and reverse the decline. The Commission recommended that the actual net productivity rate of the population (*i.e.*, zero) be used in those situations, rather than the maximum theoretical estimated net productivity rate.

The Commission commented on the draft stock assessments prepared by the Fish and Wildlife Service by letter of 1 December 1994. The Commission believed that the draft assessments generally did a good job of summarizing the available information concerning the distribution and status of the stocks and the levels of human-related mortality and injury. As with the National Marine Fisheries Service assessments, however, they did not identify uncertainties regarding stock separation, size, abundance, or trends, or the research needed to resolve those uncertainties. The Commission also noted that several of the draft assessments did not provide a clear rationale for some of the determinations made.

The Pacific scientific review group met in December 1994. The Alaska and Atlantic scientific review groups are scheduled to meet in January 1995. All three groups have agreed to provide comments on the draft stock assessment to the National Marine Fisheries Service and the Fish and Wildlife Service by mid-January. The Services expect to publish final stock assessments in late February or early March.

The New Incidental Take Regime

Section 118 of the Marine Mammal Protection Act establishes the new regime for governing the taking of marine mammals incidental to commercial fishing operations. When implemented, it will replace the interim exemption, which has regulated fisheries-related incidental taking since 1988. Under a transition provision, the new regime is to become effective when implementing regulations are in place or on 1 September 1995, whichever is earlier.

Actions required to implement new section 118 are the responsibility of the Secretary of Commerce. The amendments require, however, that the Secretary consult with the Secretary of the Interior before taking any action or making any determination that affects or relates to marine mammal stocks under the jurisdiction of the Department of the Interior — *i.e.*, manatees, dugongs, sea otters, polar bears, and walruses.

The interim exemption and the new fisheries regime have certain similarities. Under each, fishermen participating in fisheries identified as having frequent or occasional interactions with marine mammals are required to register with the Service. Under the new regime, however, only incidental mortality and serious injury are to be considered when classifying fisheries. As under the interim exemption, owners of vessels engaged in fisheries identified as having only a remote possibility of incidentally killing or injuring marine mammals need not register. They are only required to report any incidental mortality or injury of a marine mammal in the form and manner prescribed by the Secretary.

Both the interim exemption and the new regime include monitoring and reporting requirements. Unlike the annual submission of logbooks required under the interim exemption, the new regime requires fishermen to report all incidental mortalities and serious injuries to marine mammals within 48 hours of concluding the fishing trip on which the taking occurred. The new regime authorizes the National Marine Fisheries Service to place observers on board vessels participating in category I and II fisheries (those with frequent or occasional incidental mortalities or serious injuries). Under the interim exemption acceptance of observers was mandatory only for category I fisheries.

In addition, both the interim exemption and the new regime retain the Act's goal of reducing incidental mortality and serious injury of marine mammals to insignificant levels approaching zero. The new regime, for the first time, establishes a schedule for achieving this goal. Incidental mortality and serious injury rates are to reach insignificant levels within seven years of enactment of the new provision.

The most significant difference between the interim exemption and the new regime is the greater focus to be placed on those stocks most affected by commercial fisheries. Through preparation of stock assessments, the National Marine Fisheries Service and the Fish and Wildlife Service will identify strategic stocks. A strategic stock is one for which the level of

direct human-caused mortality exceeds the calculated potential biological removal level, which is declining and likely to be listed as a threatened species under the Endangered Species Act within the foreseeable future, or which is already listed as endangered or threatened under the Endangered Species Act or designated as depleted under the Marine Mammal Protection Act.

A take reduction plan is to be developed for each strategic stock (including all those that are endangered, threatened, or depleted) that interacts with a fishery that frequently or occasionally kills or seriously injures marine mammals. Take reduction plans, among other things, are to include recommended regulatory or voluntary measures designed to reduce incidental mortality and serious injury, and recommended dates for achieving specific objectives. The immediate goal of a take reduction plan for a strategic stock is to reduce, within six months, incidental mortality and serious injury to levels less than the potential biological removal level calculated in the stock assessment. The long-term goal of the plan is to reduce incidental mortality and serious injury to insignificant levels approaching a zero rate within five years, taking into account the economics of the fishery, existing technology, and applicable State or regional fishery management plans.

Another difference between the interim exemption and the new fisheries regime is in the treatment of species listed as endangered or threatened under the Endangered Species Act. Under the interim exemption there was no mechanism for authorizing the incidental take of listed species. The 1994 amendments added section 101(a)(5)(E) to the Marine Mammal Protection Act to allow incidental taking of listed species under certain circumstances. Before issuing an authorization under this provision, the Service must determine, after notice and opportunity for public comment, that (1) the incidental mortality and serious injury from commercial fisheries will have a negligible impact on the species or stock, (2) a recovery plan has been, or is being, developed, and (3) where required under section 118, a monitoring program has been established, the vessels are registered, and a take reduction plan has been or is being developed. No taking of California sea otters may be authorized under the new provision. Such takings remain subject to the requirements of public Law 99-625, which is discussed in the sea otter section of Chapter IV.

The National Marine Fisheries Service held three regional working sessions during November and December 1994 to discuss a working draft of proposed regulations to implement section 118 of the Act. The Service is considering comments provided at the working sessions and at the end of 1994 was preparing a proposed rule for publication early in 1995.

Other actions to implement certain provisions of the new regime were taken in 1994. Section 118 calls on the National Marine Fisheries Service, within 90 days of enactment of the amendments, to publish for public review and comment any proposed changes to the list of fisheries adopted under the interim exemption. After a comment period of at least 90 days, the Secretary was to publish a final list of fisheries, identifying which marine mammals interact with each fishery and estimating the number of vessels participating in each fishery.

On 4 March 1994, prior to enactment of the Marine Mammal Protection Act amendments, the National Marine Fisheries Service published for public comment the proposed list of fisheries for 1994. Inasmuch as that process was already under way, the Service decided to complete the listing of fisheries under the interim exemption before proposing changes under section 118. A final list of fisheries was published on 25 August 1994. As explained in that notice, the 1994 list will remain in effect until the interim exemption is replaced by the new regime.

On 1 September 1994 the National Marine Fisheries Service published in the *Federal Register* a notice of other possible changes to the list of fisheries. The changes being considered were prompted by two differences between the provisions of the interim exemption and those of the new regime. As noted above, the classification of fisheries under the interim exemption considers all forms of incidental taking. The new regime bases the fishery classifications on only the frequency of incidental mortalities and serious injuries. Second, the new regime prohibits the intentional lethal take of marine mammals to deter them from damaging gear and catch, as had been

allowed under the interim exemption. The Service anticipates that the frequency of taking in certain fisheries will decrease once the prohibition against intentional lethal taking is in place.

The Service also solicited comments on other criteria that had been used to classify fisheries under the interim exemption. Among other things, the Service indicated that it was reconsidering how it defined fisheries for inclusion on the list and on how take rates were used to classify fisheries. Under the interim exemption the Service looked at the take rate per vessel during a 20-day period to determine whether taking was frequent, occasional, or of a remote likelihood. Alternatives being considered by the Service include using the total number of incidental mortalities and serious injuries for the fishery each year, or assessing take rates relative to the potential biological removal levels of the affected stocks. The Service expects to publish proposed changes to the classification criteria, along with proposed changes to the list of fisheries based on those criteria, early in 1995.

As noted above, section 118 of the Act establishes a prohibition against the intentional lethal take of marine mammals in commercial fishing operations. The only exception to this prohibition is set forth in new section 101(c), which allows lethal taking if imminently necessary in self-defense or to save the life of another person in immediate danger. The National Marine Fisheries Service determined that there was no reason to delay implementation of the lethal take prohibition pending the development of implementing regulations for the entirety of section 118. Therefore, on 8 December 1994 the Service published a proposed rule to amend the regulations promulgated under the interim exemption to prohibit lethal taking except in self-defense or defense of others. The Service had hoped to have the prohibition in place by the beginning of the 1995 fishing season but at the end of 1994 a final rule had not been issued.

The Bering Sea and Gulf of Alaska Ecosystems

As noted in previous Commission reports, there have been alarming declines in populations of northern fur seals, Steller sea lions, harbor seals, and several species of fish-eating seabirds in parts of the Bering Sea and Gulf of Alaska since the mid-1970s. The causes of these declines are uncertain. Therefore, in December 1990 the Commission and the National Marine Fisheries Service jointly sponsored a workshop to identify the critical uncertainties and the research required to resolve them.

The workshop report (see Appendix B, Swartzman and Hofman 1991) was forwarded to the National Marine Fisheries Service, the Fish and Wildlife Service, and the National Science Foundation on 25 July 1991. Among other things, the report recommended that a directory of data and data sources concerning the Bering Sea and Gulf of Alaska be developed and made readily available. It also recommended that a common data management system be developed to facilitate archiving, accessing, mapping, and integrating marine mammal, seabird, fish, fishery, environmental, and other data concerning the Bering Sea and Gulf of Alaska.

In partial response to these recommendations, the Commission contracted for a study in 1992 to determine the types of data on marine mammals and their habitat, the environment, fisheries, and other related areas that is being collected and archived by various Federal and State of Alaska agencies, private institutions, and other organizations, and how those data are being archived and can be accessed. The contract report (see Appendix B, Hoover-Miller 1992) indicated, among other things, that a variety of geographic information systems were being used to archive, map, and analyze a broad range of data bearing on the conservation of marine mammals and other biota in the Bering Sea and Gulf of Alaska. It recommended that a meeting of representatives of the various agencies and organizations be held to determine how access to and use of these data might be improved.

The Commission forwarded the contract report to the National Marine Fisheries Service on 10 Decem-

ber 1992. The Commission recommended that the Service organize and convene the multi-agency consultation meeting recommended by the contractor. By letter of 5 March 1993 the Service advised the Commission that because of funding constraints it did not anticipate being able convene the recommended meeting in the foreseeable future.

As noted in its previous annual report, the Commission believed that much of the available data bearing on the conservation and protection of marine mammals and their habitat in Alaska was not being utilized fully because it was not readily accessible. Consequently, the Commission provided support in 1993 for a workshop to determine what more might be done to identify and improve access to and use of various data possibly relevant to the conservation of marine mammals and their habitat in Alaska.

The workshop was held in Anchorage, Alaska, on 5-7 April 1994. Participants included scientists and data managers from the National Marine Fisheries Service, the Fish and Wildlife Service, the U.S. Geological Survey, the Minerals Management Service, the Alaska Department of Fish and Game, the Alaska Department of Natural Resources, the Alaska Natural Heritage Program, the Florida Department of Environmental Protection, the University of Alaska, the University of Washington, and Oregon State University. Among other things, the workshop participants recommended improvement and multi-agency funding of the Arctic Environmental Data Directory maintained by the U.S. Geological Survey. The participants also recommended ways to improve communications among institutions and individuals holding and seeking data on Alaska marine ecosystems.

Following the workshop, the contractor held a number of small group meetings to determine how the workshop recommendations might best be implemented. One of the products of these meetings was establishment of the Alaska Marine Resource Information Network at the University of Alaska, School of Fisheries and Ocean Sciences in Fairbanks. Through this network, individuals from Federal, State, and private organizations can locate and exchange information regarding Alaska marine resources.

Scientific Research

As noted in the Commission's previous annual report, Canada, Japan, The People's Republic of China, the former Soviet Union, and the United States concluded the Convention for the North Pacific Marine Science Organization (PICES) in December 1990. The purpose of the convention is to promote and encourage research and exchange of information concerning living resources and other aspects of the North Pacific Ocean.

As noted also in previous Commission reports, the continued decline of Steller sea lions and other marine mammals in the Gulf of Alaska and eastern Bering Sea led to the formation in 1992 of the North Pacific Universities' Marine Mammal Research Consortium. Members include the University of Alaska, University of British Columbia, University of Washington, and Oregon State University. The purpose of the consortium is to design and conduct a program of research on North Pacific marine mammals that will address issues relevant to fisheries management and complement work being done by government agencies.

Also, in 1992 the Department of State provided funds to the National Academy of Science's Polar Research Board to undertake a comprehensive review and evaluation of information concerning the Bering Sea ecosystem. The Polar Research Board constituted a special committee to undertake this review. The committee met several times in 1993 and 1994. At the end of 1994 it had not yet completed or made known the results of its review.

Among other things, the 1994 amendments to the Marine Mammal Protection Act directed that the Secretary of Commerce, in consultation with the Secretary of the Interior, the Marine Mammal Commission, the State of Alaska, and Alaska Native organizations, "undertake a scientific research program to monitor the health and stability of the Bering Sea marine ecosystem and to resolve uncertainties concerning the causes of population declines of marine mammals, seabirds, and other living resources of that marine ecosystem." During its annual meeting on 16-18 November 1994 in Falmouth, Massachusetts, the Commission was advised by the National Marine Fisheries Service that it had completed a draft study

plan and expected to convene a series of workshops early in 1995 to identify the relevant research already being done or planned by various agencies and institutions, determine what more must be done to meet the program objectives, and develop a strategy for implementing the study plan. No further information was available at the end of 1994.

The Gulf of Maine Ecosystem

The 1994 Marine Mammal Protection Act amendments also directed the Secretary of Commerce to convene a workshop by 30 April 1995 to assess human-caused factors affecting the health and stability of the Gulf of Maine marine ecosystem. The workshop is to be conducted in consultation with the Marine Mammal Commission, the adjacent coastal states, individuals with expertise in marine mammal biology and ecology, and representatives of the environmental community and the fishing industry.

The National Marine Fisheries Service has assigned responsibility for organizing this workshop to its Northeast Fisheries Science Center. The Center has established a steering committee to guide planning of the workshop. The steering committee includes scientists from the Service, the Marine Mammal Commission, the Environmental Protection Agency, the University of Massachusetts-Boston, the University of Rhode Island, the University of Maine, Brown University, and the Marine Biological Laboratory Ecosystems Center in Woods Hole, Massachusetts. A meeting of the steering committee was held on 6 December 1994. While plans have not been finalized, the workshop is expected to be held in April 1995.

The Tuna-Dolphin Issue

For reasons not fully understood, schools of large yellowfin tuna (those greater than 25 kilograms) associate with dolphin schools in the eastern tropical Pacific Ocean, an area of more than five million square miles stretching from southern California to Chile and westward to Hawaii. In the late 1950s U.S. fishermen began to exploit this association by deploying large purse seine nets around the more readily observed dolphin schools to catch the tuna swimming below. Despite efforts by the fishermen to release the encircled dolphins, some become trapped in the nets and drown.

As the purse seine tuna fishery grew during the 1960s, so too did the level of incidental dolphin mortality. Prior to enactment of the Marine Mammal Protection Act in 1972, as many as 500,000 dolphins were being killed per year. As the Act's provisions were implemented, dolphin mortality gradually began to decline. In large part this was due to reduced take by the U.S. tuna fleet, which then dominated the fishery. Under incidental take permits issued to the American Tunaboat Association between 1974 and 1980, declining dolphin quotas were established and the use of certain fishing gear and practices mandated.

At its peak in the mid-1970s the U.S. fleet consisted of more than 150 vessels and accounted for nearly 70 percent of the fishing capacity in the eastern tropical Pacific tuna fishery. In the late 1970s and early 1980s the U.S. fleet declined and the number of foreign vessels participating in the fishery grew. As foreign vessels captured a larger share of the fishery, the problem of incidental dolphin mortality took on new dimensions. Reductions in dolphin mortality resulting from the efforts of the U.S. fleet were largely offset by increased kill by foreign vessels. Mortality figures for both the U.S. and foreign fleets since enactment of the Marine Mammal Protection Act are presented in Table 8.

In response to the increasing foreign take, the Marine Mammal Protection Act was amended in 1984 to require that each nation exporting tuna to this country provide documentary evidence that it had adopted a program comparable to that of the United States and that the average rate of incidental take by its fleet was comparable to that of the U.S. fleet. Failure to show that these requirements had been met would result in a ban on the import of yellowfin tuna and tuna products from the nation involved.

Dissatisfied with the implementation of these requirements by the National Marine Fisheries Service, Congress further amended the Act in 1988 to provide more specific guidance as to when foreign

Table 8. Estimated incidental kill of dolphins in the tuna purse seine fishery in the eastern tropical Pacific Ocean, 1972-1994[1]

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	3,488
1980	15,305	16,665
1981	18,780	17,199
1982	23,267	5,837
1983	8,513	4,980
1984	17,732	22,980
1985	19,205	39,642
1986	20,692	112,482
1987	13,992	85,185
1988	19,712	61,881
1989	12,643	84,403
1990	5,083	47,448
1991	1002	26,290
1992	439	15,111
1993	115	3,601
1994	106	3,900[2]

[1] These estimates, based on kill per set and fishing effort data, are provided by the National Marine Fisheries Service and the Inter-American Tropical Tuna Commission. They include some, but not all, seriously injured animals released alive.
[2] Preliminary estimate.

tuna-dolphin programs would be considered comparable to the U.S. program and to force timely implementation. The 1988 amendments required that, to be found comparable, a foreign program must include (1) prohibitions on encircling pure schools of certain 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 documentation of the nation's incidental take rate. In addition, the average incidental take rate for a foreign fleet may be no more than 1.25 times the U.S. rate. Limitations were also placed on the take of coastal spotted and eastern spinner dolphins. Eastern spinner dolphins may not account for more than 15 percent of the nation's total take and coastal spotted dolphins may not exceed two percent. Actions taken to implement these requirements, litigation challenging that implementation, and resulting embargoes of yellowfin tuna and tuna products are discussed in previous annual reports.

Environmental groups, not satisfied with mere reductions in dolphin mortality, continued to push for the elimination of incidental dolphin mortality. Faced with threatened consumer embargoes, in 1990 the three largest U.S. tuna canners announced they would no longer purchase tuna caught in association with dolphins. Adoption of this "dolphin-safe" policy resulted in a further exodus of U.S. tuna fishermen from the eastern tropical Pacific. In 1990, 30 U.S. vessels participated in this fishery, accounting for slightly less than one-third of the total fleet capacity. Today only eight U.S. purse seine vessels remain in the fishery and, of those, only three made sets on dolphins during 1994.

The shift to a dolphin-safe tuna policy in the United States has also diminished the importance of the U.S. market for tuna caught in the eastern tropical Pacific. In the mid-1970s the United States consumed about 85 percent of the yellowfin tuna harvested in the eastern tropical Pacific. By the end of 1992 the U.S. share had declined to less than ten percent of the catch. The largest market for yellowfin tuna from the eastern tropical Pacific is now in Europe. However, the adoption of dolphin-safe policies by Italian and Spanish canners has, to some degree, reduced the European market for tuna caught in association with dolphins. Growth in the Latin American markets has also occurred. Mexico's tuna consumption, for example, increased fivefold between 1975 and 1992.

Shifts have also occurred in the amount and species of tuna being caught in the eastern tropical Pacific. Between 1989 and 1993 the annual catch of yellowfin

tuna in the fishery declined from almost 320,000 short tons to about 262,000 short tons. The percentage of yellowfin tuna harvested in association with dolphins, however, has remained relatively constant at between 60 and 70 percent. Declining catches of yellowfin tuna have been offset somewhat the past three years by an increased harvest of skipjack tuna, the primary tuna species caught using dolphin-safe fishing methods. In 1993 about 92,000 short tons of skipjack were harvested in the eastern tropical Pacific. Catches of yellowfin and skipjack tuna in 1994 are projected to be approximately the same as 1993 levels.

Enactment of the International Dolphin Conservation Act of 1992 further amended the U.S. tuna-dolphin program. Among other things, the Act called on the Secretary of State, in consultation with the Secretary of Commerce, to enter into international agreements to establish a global moratorium of at least five years duration on harvesting tuna by setting purse seine nets on marine mammals. A tuna-fishing nation that formally committed to the moratorium and that met other applicable requirements would not be subject to an embargo of its tuna even if it had not met the comparability requirements otherwise applicable under the Marine Mammal Protection Act. If a major tuna-harvesting nation (one with 20 or more active purse seine vessels in its tuna fleet) committed to the moratorium, the incidental take permit under which U.S. tuna fishermen operate would be revoked. The moratorium was to take effect on 1 March 1994. However, no tuna-fishing nation committed to the global moratorium. As a result, the U.S. tuna fleet will continue to operate under its 1980 permit through 1999, subject to a reduced and declining quota. Implementation of other elements of the International Dolphin Conservation Act are discussed below.

Actions to reduce dolphin mortality in the eastern tropical Pacific tuna fishery have also been taken jointly by nations whose vessels participate in the fishery. In 1992 an international dolphin conservation program was established that, among other things, sets an annual dolphin mortality limit to be allocated among individual vessels. Under the U.S. and international programs, dolphin mortality has declined dramatically (by more than 95 percent over the past five years) and is now at the point where the levels of take from most if not all stocks are not biologically significant. International efforts are discussed in the Inter-American Tropical Tuna Commission section below.

In 1990 Mexico challenged the tuna embargo provisions of the Marine Mammal Protection Act as violating U.S. obligations under the General Agreement on Tariffs and Trade (GATT). The ruling in that matter, yet to be formally adopted, is discussed in previous annual reports. Discussed below is the 1994 ruling in a second challenge, brought by the European Community and The Netherlands.

The United States Fishery

U.S. tuna fishermen operate under an incidental take permit issued to the American Tunaboat Association in 1980. That permit was legislatively extended for an indefinite period in 1984. The terms of the permit were further modified by Congress in 1988 and 1992. Noting that the number of U.S. vessels fishing for tuna by setting on dolphins had greatly declined, the allowable take levels were greatly reduced. The quota for the period 1 January 1993 to 1 March 1994 was set at 800, with the additional requirement that incidental dolphin mortality be reduced by statistically significant amounts each year.

Dolphin mortality for the U.S. fleet was 115 in 1993. Thus, despite the fact that nearly 700 more dolphins could have been taken under the 1 January 1993-1 March 1994 quota, no more than 114 dolphins could be taken in 1994. Apparently some skippers were confused as to which quota would govern operations in 1994 and, as a result, by 6 February 1994 the Service estimated that dolphin mortality had already reached 107. Predicting that dolphin mortality would reach 114 within a matter of days, the National Marine Fisheries Service prohibited further taking of any dolphins effective 8 February 1994. Setting on dolphins under the permit will again be permitted in 1995, but the mortality must be less than the number of dolphins killed in 1994 by a statistically significant amount. As of the end of 1994 no U.S. vessel had indicated an intent to fish for tuna in association with dolphins during 1995 by requesting an individual dolphin mortality quota under the international program.

The American Tunaboat Association permit has been modified not only to decrease allowable levels of dolphin mortality but also to reduce the number of dolphin stocks on which fishermen may set their nets. The International Dolphin Conservation Act of 1992 amended the permit to prohibit purse seine nets from being deployed to encircle any school of dolphins in which any eastern spinner dolphin or coastal spotted dolphin is observed prior to release of the net skiff. As discussed in the previous annual report, the National Marine Fisheries Service in 1993 designated the eastern spinner dolphin and the northeastern offshore spotted dolphin as depleted under the Marine Mammal Protection Act. Based upon the depletion designation for the northeastern offshore spotted dolphin, Earth Island Institute filed suit to have the Service prohibit purse seine nets from being deployed to encircle any dolphin from that stock. Moreover, because dolphins from that stock sometimes intermix with offshore spotted dolphins from the western/southern stock and because dolphins from the two stocks are difficult to differentiate, the plaintiffs maintained that sets on all offshore spotted dolphins must be prohibited.

While the prohibition against setting on dolphin schools in which eastern spinner and coastal spotted dolphins are observed may be inconvenient for tuna fishermen, a prohibition against setting on offshore spotted dolphins would have profound impacts on the fishery. Offshore spotted dolphins are the species most frequently used to locate large yellowfin tuna. For example, in its depletion rule for the northeastern stock, the Service estimated that, of the nearly five million dolphins killed incidental to tuna-fishing operations between the inception of the purse seine tuna fishery in 1959 and the enactment of the Marine Mammal Protection Act in 1972, almost 70 percent were offshore spotted dolphins. Even if the prohibition were limited to the northeastern stock, there would likely be significant impacts. More than one-third of the estimated dolphin mortality between 1985 and 1990 was from this stock.

The district court ruled on 27 January 1994 (*Earth Island Institute* v. *Brown*) that a depletion finding necessitated a prohibition on taking from the stock. Consistent with that ruling, on 1 February 1994 the National Marine Fisheries Service advised U.S. fishermen operating under the American Tunaboat Association permit that all sets on northeastern offshore spotted dolphins were prohibited. On 4 February 1994 the Service further advised U.S. tuna fishermen that, in line with the court order directing the Service to minimize the take of dolphins from that stock, sets on all offshore spotted dolphins were prohibited. Inasmuch as U.S. tuna fishermen were not allowed to take any dolphins after 7 February because the quota had been reached, the prohibition regarding sets on offshore spotted dolphins had little or no effect on them in 1994. As discussed below, however, the prohibition against setting on offshore spotted dolphins did affect foreign fleets, which must adopt a comparable prohibition to be allowed to import yellowfin tuna into the United States.

After reviewing information on the geographical boundary separating the northeastern and western/southern stocks of offshore spotted dolphins, the court modified its order. Under the revised order, the prohibition against setting on offshore spotted dolphins applies only within the geographical boundaries used to define the northeastern stock — *i.e.*, the area between 5° and 40° N latitude and bounded by 120° W longitude on the west and the coastlines of North, Central, and South America on the east. The National Marine Fisheries Service published a final rule to codify the revised order on 20 October 1994.

The International Dolphin Conservation Act of 1992 also placed new restrictions on the sale of tuna in the United States. On 1 June 1994, irrespective of whether the international moratorium on dolphin sets were implemented, it became unlawful to sell, purchase, offer for sale, transport, or ship any tuna or tuna product in the United States that is not dolphin-safe. These prohibitions apply to tuna harvested worldwide and do not differentiate between tuna harvested by U.S. and foreign fishermen. The National Marine Fisheries Service issued implementing regulations on 13 June 1994.

The U.S. tuna-dolphin program also includes a significant research component. Past efforts, which focused on monitoring the status of dolphin stocks in the eastern tropical Pacific Ocean, are discussed in previous annual reports. More recently, researchers

have concentrated on identifying alternative fishing methods that would eliminate dolphin mortality.

In March 1994 the National Marine Fisheries Service held the second dolphin-safe research planning workshop to consider the direction of research for the next few years. The workshop focused on the evaluation of technologies for detecting large yellowfin tuna not associated with dolphins and on developing alternative gear for capturing tuna without encircling dolphins. Top research priorities for fiscal year 1995 are the preliminary modeling of acoustic, optical, and radar signal propagation in the eastern tropical Pacific environment and identification of target signatures for large yellowfin tuna, and a workshop to evaluate the practicality of separating tuna and dolphins prior to encirclement.

During 1994 the National Marine Fisheries Service and Inter-American Tropical Tuna Commission completed the second year of a joint project to track yellowfin tuna and spotted dolphins in the eastern tropical Pacific. This project is described in the discussion of the Inter-American Tropical Tuna Commission below.

The Service also funded research to test a passive optical technique (multispectral imaging) to detect subsurface objects and a new light detecting and ranging device (LIDAR) as a means of predicting the biomass of fish concentrations. Results from these investigations were sufficiently promising for research to continue in 1995.

The International Fishery — As discussed above, the Marine Mammal Protection Act sets comparability standards that foreign nations must meet to be allowed to export tuna to the United States. Affirmative comparability findings were made in 1993 for three tuna-fishing nations, Vanuatu, Ecuador, and Spain. Ecuador and Spain met the U.S. comparability requirements by enacting and enforcing laws prohibiting their vessels from making sets on dolphins. Vanuatu, whose fleet fishes for tuna by setting on dolphins, satisfied the comparability requirements by meeting the performance standards established by the Marine Mammal Protection Act. On 6 May 1994 the National Marine Fisheries Service made an affirmative comparability finding for Colombia. During fishing year 1993 (1 October 1992 to 30 September 1993) Colombian vessels made only one set involving the encirclement of dolphins. No dolphin injuries or mortalities resulted from that set. The findings for Ecuador, Spain, Vanuatu, and Colombia were to remain valid through the end of 1994 unless a subsequent finding were made that the national program was no longer comparable.

As noted above, the district court ruled in *Earth Island Institute* v. *Brown* that the National Marine Fisheries Service could not permit any taking of northeastern offshore spotted dolphins by U.S. tuna fishermen. Under applicable regulations, the tuna-dolphin program of a foreign nation is considered comparable to the U.S. program only if the nation incorporates any new prohibitions added by the United States within 180 days of the U.S. action. Neither Vanuatu nor Colombia submitted documentary evidence that it had added a prohibition on encircling northeastern offshore spotted dolphins to its regulatory program by 26 July 1994. Therefore, on 28 September the National Marine Fisheries Service withdrew the comparability findings and imposed an immediate ban on tuna imports from these two countries. In addition, embargoes of tuna from Mexico, Venezuela, and Panama remained in effect throughout 1994.

The Marine Mammal Protection Act also imposed a secondary embargo against tuna from intermediary nations that import tuna from a harvesting nation subject to a U.S. embargo. The Act was amended in 1992 to clarify that only those nations that import yellowfin tuna and tuna products from harvesting nations subject to an embargo on direct exports to the United States are considered to be intermediary nations. In addition, any nation that certifies and provides reasonable proof that it has not imported tuna from an embargoed harvesting nation within the previous six months is not subject to a secondary embargo. Throughout 1994 intermediary nation embargoes were in effect against yellowfin tuna from Costa Rica, Italy, and Japan.

Regardless of whether it is a harvesting nation or an intermediary nation, any nation from which tuna has been embargoed for six months is to be certified by the Secretary of Commerce and may face additional sanctions under the Pelly Amendment to the Fisher-

men's Protective Act. While both harvesting nations and intermediary nations have been certified, no sanctions on other fish products have been imposed.

The International Dolphin Conservation Act of 1992 prohibited, subject to certain exceptions, persons and vessels subject to U.S. jurisdiction from intentionally setting purse seine nets to encircle marine mammals during any tuna-fishing operation after 28 February 1994. In a 25 February 1994 letter, the National Oceanic and Atmospheric Administration's general counsel expressed the view that this prohibition applied to U.S. citizens working onboard foreign vessels in the eastern tropical Pacific. Although four U.S. citizens working onboard foreign purse seiners filed suit to challenge this determination, the court dismissed the suit without addressing the merits of their claims. Consistent with the general counsel's opinion, the National Marine Fisheries Service on 12 October 1994 published a proposed rule that, if adopted, would clarify that the prohibition against setting on marine mammals on the high seas applies to U.S. citizens regardless of the flag under which the vessel operates. Under the proposed rule, the prohibition would not apply to actions taken by U.S. citizens within the territorial waters of foreign nations.

Data comparing annual dolphin mortality, mortality rates, fishing effort, observer coverage, and the number of vessels participating in the fishery for the U.S. and foreign fleets over the past seven fishing seasons are provided in Table 9. Complete 1994 data are not yet available, but where possible, estimates based on partial-year data are provided.

Preliminary estimates for the foreign fleet indicate that incidental dolphin mortality during 1994 exceeded the record-low take of 3,487 dolphins in 1993. This increase appears to be attributable entirely to increased fishing effort directed at dolphin sets, rather than a decline in operator performance. Preliminary figures show that the number of sets on dolphins increased by nearly 20 percent over 1993 and that the mortality per set rate declined slightly. The increase in dolphin sets may signal a trend on the part of foreign tuna fishermen towards abandoning efforts to retain access to the U.S. market.

Two things about the statistics for 1993 and 1994 are encouraging. First, overall performance, as measured by the number of dolphins killed per set, continues to improve. During 1993, the last year for which data are available, 86 percent of sets made on dolphins resulted in no dolphin mortalities. This compares favorably with data from the mid-1980s, when less than half of the sets resulted in zero mortality. Second, overall dolphin mortality in the eastern tropical Pacific tuna fishery has declined by more than 95 percent in the past five years. In the view of the Inter-American Tropical Tuna Commission and others, take rates for all dolphin stocks in the eastern tropical Pacific have declined to the point where they are no longer significant from a biological perspective. Data from 1993 indicate that northeastern offshore spotted and eastern spinner dolphins suffered the highest mortality relative to stock size. The relative mortality for these two stocks were 0.16 percent and 0.13 percent, respectively. These take rates are far below the estimated annual rate of net recruitment for dolphins stocks, which has been estimated conservatively at two percent.

Inter-American Tropical Tuna Commission

The Inter-American Tropical Tuna Commission is an international body established in 1949 to study the tuna resources of the eastern tropical Pacific Ocean and make recommendations for the management and conservation of those resources. As the foreign share of the purse seine fishery grew, and associated marine mammal mortality increased, the role of the Tuna Commission was expanded. Beginning in 1977 the Tuna Commission was charged with monitoring incidental mortality of dolphins throughout the fishery, assessing the impact of that mortality on dolphin stocks, and introducing measures to reduce the level of take to the maximum extent possible.

At a special meeting of the Inter-American Tropical Tuna Commission in 1990, participants from all nations with a significant interest in the eastern tropical Pacific tuna fishery — whether members of the Commission or not — met and adopted a resolution calling for an expanded dolphin conservation program. That program called for limits on dolphin mortality, 100 percent observer coverage, research programs to improve existing fishing gear and tech-

niques and to investigate possible alternative fishing methods that may eliminate dolphin mortality, and a training program to improve operator performance throughout the international fleet.

As discussed in previous annual reports, further efforts to achieve a reduction in dolphin mortality were agreed to at a special meeting of the Tuna Commission held in 1992. Participating governments resolved to adopt a multilateral program to reduce incidental dolphin mortality in the eastern tropical Pacific to levels approaching zero by setting annual limits. The annual limits on total incidental dolphin mortality established by that resolution were 19,500 in 1993, 15,500 in 1994, 12,000 in 1995, 9,000 in 1996, 7,500 in 1997, 6,500 in 1998, and less than 5,000 in 1999. Other aspects of the program adopted under the resolution were (1) the continuation of the international observer program with the additional requirement that at least 50 percent of the observers deployed by a nation each year be placed by the Tuna Commission; (2) the establishment of a review panel to monitor compliance by the international fleet with the annual dolphin mortality limits; (3) expansion of the existing research and education programs, including an increase in efforts to find methods of catching large yellowfin tuna that do not involve encirclement of dolphins; and (4) establishment of a scientific advisory board to assist the Tuna Commission in efforts to coordinate, facilitate, and guide research directed at reducing dolphin mortality.

The parties subsequently agreed to a system whereby each vessel participating in the fishery would be given an individual dolphin mortality limit. Any vessel that exceeds its dolphin limit will have the amount of the excess deducted from its limit for the following year.

The parties adopted a resolution in 1993 to modify the overall dolphin mortality limit for 1994. In light of the unanticipated success of fishermen in reducing dolphin mortality during 1993, the United States proposed that the dolphin mortality limit be cut to a level equal to or less than the actual take in 1993. The other countries argued for a higher limit so as not to penalize fishermen for their performance in 1993 and to provide some latitude if changed circumstances make it difficult for fishermen to repeat their success in 1994. After considerable discussion, the parties agreed to a 40 percent reduction in the dolphin mortality limit for 1994, adopting a limit of 9,300 dolphins. The parties further agreed to review the overall dolphin mortality limits in future years to determine if further reductions in the quotas can be achieved.

For 1994, 73 vessels, including three from the United States, received individual dolphin mortality limits. Each vessel was given an individual dolphin mortality quota of 127 dolphins. In addition, two other vessels were given quotas of 63 dolphins for the second half of 1994.

At a 17-19 October 1994 meeting of the International Review Panel, it was reported that two vessels had exceeded their individual dolphin mortality limits for 1994 and had stopped setting on dolphins. Due mainly to one set with very high mortality, it was predicted that total dolphin mortality for 1994 would be slightly higher than it was in 1993. The panel discussed the need to amend the quota system to address instances when very-high-mortality sets occur. The panel noted that such sets occur rarely, perhaps once in 50,000 sets, even when the captain and crew have taken all possible steps to avoid dolphin mortalities. The consequences of such a set can also be serious for the vessel, which may be unable to qualify for a dolphin mortality quota for a number of years under the existing system. The panel decided that the circumstances surrounding so-called "disaster sets" should be reviewed and a full or partial waiver considered if no infraction were involved and no gear malfunction or failure resulting from lack of proper maintenance caused or contributed to the mortality. The amount of any adjustment would depend on whether the overall dolphin mortality quota for the year had been exceeded. The panel's proposed approach to the disaster set problem was adopted by the parties to the intergovernmental agreement on 20 October 1994.

For 1995, 81 vessels requested individual dolphin mortality limits. Of these, 42 were from Mexico, 19 from Venezuela, 13 from Vanuatu, 6 from Colombia, and 1 from Panama. No U.S. vessels requested a dolphin mortality limit for 1995.

Table 9. Estimated U.S. and foreign dolphin mortality, kills per set, sets on dolphins, percent observer coverage, and number of vessels, 1988-1994[1]

	1988	1989	1990	1991	1992	1993	1994[2]
Dolphin Mortality							
U.S.	19,712	12,643	5,083	1,002	439	115	106
Foreign	61,881	85,403	47,448	26,290	15,111	3,487	~3,900
Total[3]	78,927	96,979	52,531	27,292	15,539	3,601	~4,000
Kills per Set							
U.S.	5.28	3.60	2.75	2.49	0.66	0.58	1.93
Foreign	9.17	9.34	5.41	2.90	1.56	0.52	~0.50
Combined	7.51	7.71	4.97	2.88	1.50	0.52	~0.50
Sets on Dolphins							
U.S.	3,766	3,435	1,801	430	654	201	55
Foreign	6,749	9,145	8,770	9,052	9,672	6,752	~8,100
Total	10,515	12,580	10,571	9,482	10,326	6,953	~8,150
Observer Coverage[4]							
U.S.	53.2%	99.0%	100.0%	100.0%	100.0%[5]	100.0%[5]	100.0%[5]
Foreign	35.3%	35.5%	40.1%	56.4%	68.2%[6]	76.1%[6]	74.6%[6]
Combined	40.4%	48.2%	48.8%	59.7%	65.5%[7]	73.1%[7]	72.7%[7]
Number of Vessels[8]							
U.S.	40	30	29	13	8	8	8
Foreign	92	92	94	91	88	89	93[9]
Combined	132	122	123	104	96	97	99

1 Data for the U.S. fleet are provided by the National Marine Fisheries Service. Data for the foreign fleets are provided by the Inter-American Tropical Tuna Commission.
2 1994 figures for the foreign fleet are preliminary estimates.
3 Estimates of total dolphin mortality are provided by the Inter-American Tropical Tuna Commission. It and the National Marine Fisheries Service use different methodologies to estimate dolphin mortalities and, as a result, estimated total mortality may not equal the sum of the estimated mortalities for the U.S. and foreign fleets.
4 Observer coverage levels are given for the percentage of trips observed.
5 Includes observers placed under the United States and the Inter-American Tropical Tuna Commission observer programs.
6 Estimates of observer coverage for the foreign fleet for 1991, 1992, 1993, and 1994 do not include observers placed under the national program of Mexico. International fleet coverage, including trips covered by the national programs of Mexico and the United States, was 100 percent in 1993 and 1994.
7 Estimates of total observer coverage for 1992, 1993, and 1994 do not include observers placed under the national programs of Mexico or the United States.
8 Includes all purse seine vessels with a carrying capacity of 400 short tons or greater.
9 Includes three U.S. purse seine vessel that re-registered under other flags during 1994.

The parties to the intergovernmental agreement met on 20-21 October 1994 to consider revision of the total dolphin mortality limit for 1995. In light of the success of the fleet in reducing incidental mortality in 1993 and 1994, the United States proposed that a dolphin mortality limit of 4,000 be established. Other nations favored retaining the 1995 mortality limit at 12,000, as originally adopted in 1992. The United States representative stated that this would be contrary to the agreement reached in 1994 that the 1995 dolphin mortality limit would be less than that adopted in 1994. After further review, the parties agreed to

an overall quota for 1995 of 9,300 dolphins. While this is the same overall limit adopted in 1994, it was noted that, because eight additional vessels had requested quotas, it amounted to about a ten percent decrease in the mortality limit assigned to each vessel. The individual dolphin mortality limit for each of the vessels in 1995 is 114.

As noted above, the 1992 intergovernmental agreement called for an expansion of existing research and education programs in an effort to reduce or eliminate dolphin mortality and for the establishment of a scientific advisory board to assist the Tuna Commission in efforts to coordinate, facilitate, and guide research directed at reducing dolphin mortality. Due to a lack of funds, however, the scientific advisory board has met only once since its establishment. Nevertheless, the Inter-American Tropical Tuna Commission has continued to pursue research into improved and alternative fishing methods.

Among the research projects carried out by the Tuna Commission in 1994 was a field investigation of a modified dolphin safety panel to be used in purse seine nets to facilitate the release of dolphins. Initial tests of the modified panel proved promising and additional research is planned for 1995.

Also during 1994 the Tuna Commission tagged and tracked spotted dolphins and yellowfin tuna to better determine the association between the two species. Data from the study revealed distinct day and night difference in dolphin diving patterns. Deeper dives are made at night, particularly just before dawn and just after sunset. Tuna showed a different diving pattern, staying above the thermocline during the day and occasionally swimming below the thermocline at night. The suggested niche separation between spotted dolphins and yellowfin tuna was also apparent in studies of food habits conducted by the Tuna Commission and the National Marine Fisheries Service. Dolphins appeared to feed primarily at dusk, night, and dawn on mesopelagic fishes and cephalopods associated with the deep scattering layer. The tuna appeared to feed primarily on epipelagic fishes, cephalopods, and crustaceans during daytime and, to a lesser degree, on epipelagic cephalopods at night. It is hoped that the identification of behavioral differences between tuna and dolphins will allow tuna fishermen to continue to use dolphins to locate large yellowfin tuna without the need to encircle the dolphins to catch the associated tuna.

General Agreement on Tariffs and Trade

The General Agreement on Tariffs and Trade (GATT) is an international agreement that sets forth limitations on the use of international trade restrictions, such as taxes, duties, quotas, or unnecessarily restrictive standards. The agreement was originally drafted in 1947 and currently has more than 100 contracting parties, including the United States. Trade disputes that may arise between contracting parties are settled either by consultations between the parties or, if consultations prove unsuccessful, by referral to a formal dispute panel. A challenge to the tuna embargo imposed by the United States under the Marine Mammal Protection Act was brought by Mexico in 1990 and was discussed in previous annual reports.

A separate challenge to the tuna embargo provisions of the Marine Mammal Protection Act applicable to intermediary nations was filed under the General Agreement in 1992 by the European Community and The Netherlands, acting on behalf of The Netherlands Antilles. Proceedings in the matter were suspended following passage of the International Dolphin Conservation Act to enable the parties to pursue further consultations. Those consultations failed to resolve the dispute and the European Community and The Netherlands proceeded with their challenge before the GATT panel.

The panel submitted its report to the parties on 20 May 1994. Consistent with the ruling in the Mexican challenge, the panel found that, because the Marine Mammal Protection Act related to harvesting methods and because "none of those practices, policies, and methods could have any impact on the inherent character of tuna as a product," Article III did not apply.

The panel used a three-step process to review the applicability of exceptions under Articles XX(b) and XX(g), which allow contracting parties to adopt trade measures "necessary to protect human, animal or plant life or health" or "relating to the conservation of

exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption." The panel first considered whether the policy underlying the trade measure fit within the range of policies meant to conserve exhaustible natural resources and, if so, whether the policy was made effective in conjunction with domestic restrictions. The panel determined that dolphins are exhaustible natural resources subject to the exception. Moreover, the panel appears to have rejected, at least implicitly, the determination of the panel in the Mexican challenge that Articles XX(b) and (g) do not allow measures to protect extraterritorial resources.

Second, the panel considered whether the trade measure is "related" to the conservation of the exhaustible resource. The panel ruled that the embargoes covered tuna from certain countries whether or not the particular tuna had been harvested in a way that harmed or could harm dolphins. Further, the panel stated that, if Article XX "were interpreted to permit contracting parties to take trade measures so as to force other...parties to change their policies within their jurisdiction...the balance of rights and obligations..., in particular the right of access to markets, would be seriously impaired." If this were allowed, the panel reasoned, GATT "could no longer serve as a multinational framework for [international] trade." This conclusion is similar to that reached by the panel in the Mexico case.

The third factor identified by the panel was whether the trade measure conformed to the headnote of Article XX, which requires (1) that the measure not be applied in a manner that would constitute arbitrary or unjustifiable discrimination between countries where the same conditions prevail, and (2) that the measure not constitute a disguised restriction on international trade. Because the tuna embargoes established by the Marine Mammal Protection Act were found to be inconsistent with Article XX(g), the panel saw no need to address this issue.

A similar three-step analysis was applied to the Article XX(b) exception. The panel found that GATT did not prohibit measures intended to protect resources beyond the jurisdiction of the country imposing the trade restriction. The panel found, however, that the Marine Mammal Protection Act embargo was not a "necessary" restriction as required by Article XX(g). Because both the primary and secondary tuna embargoes attempt to "force other countries to change their policies within their jurisdiction," they cannot be considered to be necessary.

Neither panel ruling has yet to be considered for adoption by the parties to GATT.

Pinniped-Fishery Interaction Task Forces

As discussed in Chapter II, the 1994 amendments to the Marine Mammal Protection Act added three new sections regarding interactions between commercial fisheries and marine mammals. One of these, section 120, focuses specifically on conflicts between fishermen and pinnipeds and provides a mechanism for authorizing the lethal removal of individual pinnipeds that are adversely affecting certain salmonid stocks without obtaining a waiver of the Act's moratorium on taking. Under this provision, states may apply to the Secretary of Commerce to obtain authorization for the intentional lethal taking of pinnipeds in certain instances. Such authorization may not be granted if the pinniped stock is listed as threatened or endangered under the Endangered Species Act or is designated as depleted or as a strategic stock under the Marine Mammal Protection Act.

Ballard Locks

One of the most vexing situations involving interactions between pinnipeds and fisheries has developed in the Pacific Northwest where the growth of the California sea lion population has coincided with a decline in stocks of certain salmonid species. In particular, sea lion predation at Chittenden Locks in the Ballard neighborhood of Seattle is believed to have contributed to the decline in the winter run of wild steelhead trout returning to Lake Washington. The number of steelhead returning to spawning streams through Chittenden Locks (also known as Ballard Locks) declined from a maximum of 3,000 in the early 1980s, when predation by sea lions was first observed, to less than 100 in the 1993-1994 winter run.

At the same time, the number of sea lions in the area increased substantially.

The Marine Mammal Protection Act prohibits the taking of marine mammals except under certain conditions. One such exception is provided under section 109 (h)(1), which, among other things, authorizes the non-lethal removal of nuisance animals. Accordingly, beginning in 1985 the National Marine Fisheries Service and the Washington Department of Wildlife attempted several non-lethal methods to reduce sea lion depredation of steelhead trout during the winter run at Ballard Locks. These included underwater firecrackers and other acoustic harassment devices, hazing with real and model boats, taste aversion experiments, barrier nets, and translocation of individual animals. None of the measures were effective over the long term.

Frustrated by the lack of success in this area, in 1990 the Service considered an interpretation of section 109(h)(1)(B) of the Marine Mammal Protection Act that would have permitted lethal removal of California sea lions; however, it concluded that such measures were outside the Congressional intent behind that provision. During the 1990-1991 and 1991-1992 steelhead runs, no predator control experiments were attempted at Ballard Locks. Instead, Federal and State agencies shifted emphasis to fish enhancement efforts, including illumination of the fishway to encourage nighttime fish passage through the locks. During the 1992-1993 season, acoustic devices were again tested to attempt to keep sea lions away from the fishway. However, their effectiveness was limited and spawning escapement dropped to an all-time low.

Prior to the 1993-1994 run, the growing concern over the possible extinction of the wild steelhead trout run at Ballard Locks drew the direct attention of Congress. On 2 November 1993, six members of the House of Representatives' Merchant Marine and Fisheries Committee wrote to the National Marine Fisheries Service asking for immediate assistance in preventing further predation of wild steelhead by California sea lions at Ballard Locks. In the letter, the members noted that the question of the Service's legal authority for lethal removal of animals was unresolved. Therefore, the Committee members asked the Service immediately to convene a task force of experts to recommend possible solutions. The letter further requested that, if there was not time to implement recommendations in advance of the 1993-1994 winter steelhead run, the Service capture all California sea lions reasonably believed to inhabit the area near the locks and hold the animals in short-term captivity until the wild steelhead had passed the locks.

In response, on 18 November 1993 the Service convened a group of technical experts from the Service and the Washington Department of Wildlife who had long-term involvement with the sea lion-steelhead conflict. The group developed a proposed approach consisting of a short-term "predation control" program and a long-term "passage enhancement studies" program. On 19 November 1993 the group met with the staffs of the concerned members of Congress to present the proposed plan of action. Despite the fact that little or no funding had been appropriated for the effort, the Service's Northwest Region agreed immediately to initiate an acoustic deterrence project proposed as part of the short-term predation control effort.

Recognizing the need to assess objectively the Ballard Locks interaction problem, the Marine Mammal Commission contracted in January 1994 with an independent biologist to compile and review available information concerning sea lion predation on steelhead trout at Ballard Locks, assess other factors that may have caused or contributed to the steelhead decline, and recommend possible measures for resolving the problem.

In his report (see Appendix A, Fraker 1994) the author noted that, while not of the magnitude of the Lake Washington decline, there appears to have been a widespread decline in steelhead and other salmonid populations throughout the Northwest. The causes are not known but may include competition with other salmon, authorized and unauthorized high-seas driftnet fisheries, and large-scale environmental changes (*e.g.*, El Niño). In addition, the report noted that it had recently become apparent that harbor seals and fish-eating birds may consume sufficiently large numbers of out-migrating steelhead smolts to contribute significantly to the problem. The report concluded that while marine mammal predation may be important locally at places like Ballard Locks, it does not appear

to have been great enough to explain the general decline in fish stocks elsewhere in the Northwest. The report also provided a general cost-benefit analysis of steps that have been and possibly could be taken to stop or reduce sea lion predation on steelhead trout at Ballard Locks.

A draft of the contractor's report was provided to representatives of the National Marine Fisheries Service, the Washington Department of Wildlife, and other interested groups for review and comment on 15 March 1994. Copies also were provided to Members of Congress for consideration prior to the 1994 reauthorization of the Marine Mammal Protection Act.

On 30 April 1994 the amendments to the Marine Mammal Protection Act were signed into law. Under section 120(b)(1) a state may apply to the Secretary of Commerce to authorize the intentional lethal taking of individually identifiable pinnipeds that are having a significant negative impact on salmonid fishery stocks that (a) have been listed as threatened or endangered under the Endangered Species Act, (b) are found to be approaching threatened or endangered species status, or (c) migrate through Ballard Locks. Upon receipt of an application proposing the lethal taking of pinnipeds, the Secretary is directed to establish a pinniped-fishery interaction task force charged with reviewing public comments on the application and recommending to the Secretary whether to approve or deny the application.

Under section 120(c)(4) of the Marine Mammal Protection Act, the Secretary of Commerce has 30 days from the time of receipt of a task force report and recommendations to either approve or deny an application for the lethal removal of pinnipeds. Section 120(d) of the Act identifies the factors that should be weighed in determining whether to approve or deny an application. These include (1) population trends, feeding habits, the location of the pinniped interaction, how and when the interaction occurs and how many individual pinnipeds are involved; (2) past efforts to non-lethally deter such pinnipeds and whether the applicant has demonstrated that no feasible and prudent alternatives exist and that the applicant has taken all reasonable non-lethal steps without success; (3) the extent to which such pinnipeds are causing undue injury or impact to, or imbalance with, other species in the ecosystem, including fish populations, and (4) the extent to which such pinnipeds are exhibiting behavior that presents an ongoing threat to public safety.

On 12 July 1994 the National Marine Fisheries Service received a petition, dated 30 June 1994, from the Washington Department of Wildlife seeking authorization for the intentional lethal taking of individually identifiable California sea lions preying on wild stocks of steelhead trout migrating through the Ballard Locks. The petition also asked for establishment of a pinniped-fishery interaction task force as provided in section 120(c) of the Act. In its request, the State noted that although other factors may have contributed to the decline of the wild steelhead population, since 1985 "extensive studies have documented that sea lion predation is the principal factor affecting the current steelhead status." The request outlined a proposed method for identifying individual depredating animals and for effecting their lethal removal. It asked that the Service take action in time to protect the next run (December 1994 through March 1995).

By letter of 27 July the National Marine Fisheries Service advised the Commission that it had received the application, determined that it satisfied the requirements of section 120, and intended to establish a pinniped-fishery interaction task force, as requested, to review and recommend a response to the application. On 2 August 1994 the Service announced its plans in the *Federal Register* and called for public comment and information.

The Ballard Locks Pinniped-Fishery Interaction Task Force was established by the Service on 30 September 1994. Members included representatives of the National Marine Fisheries Service, concerned Indian tribes, the academic community, recreational fishermen, and environmental and conservation groups. During October and November, the task force met several times, and on 22 November 1994 it forwarded its report and recommendations to the National Marine Fisheries Service.

In the report, the task force noted that the California sea lion population is growing at a rate of about 10 percent a year; the returns of Lake Washington steelhead trout, relatively stable for several decades,

had declined from 2,500-3,000 in the early and mid-1980s to 76 (of which six were eaten by sea lions) for the 1993-1994 winter run; and past efforts by the Service and the State of Washington to reduce sea lion predation by non-lethal means had been expensive and ineffective.

The task force recommended that sea lions preying on steelhead trout in the vicinity of Ballard Locks be removed, preferably by non-lethal means, to reduce predation during the 1994-1995 winter run. The task force further recommended that the Service and the State use existing or build new captive holding facilities to restrain identified predatory sea lions temporarily, that is through the length of the steelhead run. If adequate facilities are not available or cannot be constructed to hold the required number of animals during the 1994-1995 run, the task force recommended that the agencies undertake lethal removal of sea lions provided that (a) predation exceeds 10 percent of the available steelhead trout in any consecutive seven-day period after 1 January 1995; (b) captured sea lions will be euthanized humanely; (c) the Army Corps of Engineers provides a report to the Service on its response to recommendations on improving the fish passage at Ballard Locks; and (d) the Service and the Washington Department of Wildlife investigate the benefits of expanding or modifying frequency and area of coverage of the acoustical devices employed near the locks. The task force further recommended that up to 40 individually identified sea lions be removed either non-lethally or lethally with the caveat that if the number removed reaches 20, the task force reconvene and, if 15 are lethally removed, such removal should stop and the task force immediately reconvene to evaluate results and options and make further recommendations.

Not all members of the Ballard Locks task force supported the recommendations put forth in the report submitted to the Service on 22 November. On 5 December 1994 a minority report signed by eight of the 21 task force members was provided to the Service. That report noted that the minority members had voted against lethal take of sea lions based on their belief that: (1) data did not support the premise that removing sea lions would accomplish the stated goal; (2) the animals removed likely would be replaced by other animals so that removal of 40 animals would not stop predation near the locks; (3) lethal removal would constitute a significant precedent that has broad implications for future management of marine mammal-fisheries interactions under the Marine Mammal Protection Act; and (4) the State of Washington had failed to demonstrate that "no feasible and prudent alternatives exist." The group also expressed as one of its most serious concerns the lack of responsiveness from the Army Corps of Engineers to more than five years of correspondence with the Service regarding needed improvements to the fish passage at the locks.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed both the majority and minority reports and by letter of 19 December 1994 provided comments to the National Marine Fisheries Service. With respect to the timing of the Service's response to the Ballard Locks application, the Commission noted that, although the Service could presumably delay its decision until 4 January 1995, it recommended that the Service make its decision and be ready to implement appropriate actions by 1 January 1995.

With regard to population trends, the Commission noted that the successful return of steelhead to the spawning grounds has been declining since 1986-1987 and reached a low of 70 in 1993-1994. It further noted its understanding that the Service is currently conducting a status review of steelhead in the Pacific Northwest under the Endangered Species Act. In light of the observed decline and the task force's conclusion that the run is near extinction, the Commission recommended that the Service expedite its status review of the Lake Washington winter run of wild steelhead and, if appropriate, consider an emergency listing of the stock under the Endangered Species Act. The Commission pointed out that such a listing would place an affirmative duty on the Army Corps of Engineers under section 7(a)(1) to carry out programs for the conservation of the steelhead population and would also trigger the requirements of section (7)(a)(2), which prohibits the agency from taking any action that is likely to jeopardize the continued existence of a listed species.

With respect to the task force's recommendation that the Washington Department of Wildlife, Indian

tribes, and, as requested, Federal managers immediately begin to develop and implement a recovery plan for Lake Washington wild steelhead, the Commission noted that listing under the Endangered Species Act would require such a plan. Inasmuch as such listing appears to be warranted, the Commission recommended that the Service immediately begin developing and implementing a recovery plan under section 4(f) of the Endangered Species Act.

With respect to the requirement to consider non-lethal alternatives, the Commission pointed out that the task force report did not identify what additional actions were considered and dismissed by the Service and the Washington Department of Wildlife and, therefore, it was not possible to determine whether the applicant had met the burden of demonstrating that no feasible and prudent alternative to lethal removal exists. Therefore, the Commission recommended that the Service, as part of its decision-making process, identify all non-lethal alternatives that have been or should be considered and explain why they are believed to be infeasible or imprudent. The Commission noted that it was particularly important to do this prior to authorizing any intentional lethal take, inasmuch as the task force seemed to have identified several possible non-lethal alternatives, including its preferred alternative. In particular, the Commission noted that several of the alternatives involving modification of the area around Ballard Locks (*e.g.*, improvements to the fish ladder and construction of sea lion barriers or steelhead refuges) are aimed at reducing predation and should be assessed before lethal removal is authorized.

Section 120 also requires that an applicant demonstrate that it has taken all reasonable non-lethal steps to address the predation problem without success. In its letter, the Commission pointed out that, in the view of the minority members of the task force, the State of Washington had failed to make this showing.

The provisions of the 1994 amendments authorizing lethal take also specify other requirements. For instance, section 120(b) limits intentional lethal taking to individually identifiable animals that are having a significant negative impact on the decline or recovery of certain salmonid fishery stocks. In its letter, the Commission pointed out that, rather than identifying the specific animals that would be subject to removal, the task force recommended criteria for identifying animals to be removed based on observed predation of steelhead. The Commission noted that this may be an easier approach to implement but it is not clear that it conforms with the statutory requirements. In the Commission's opinion, by establishing criteria for identifying problem sea lions, rather than identifying the individuals specifically, the task force recommended an undetermined number of removals.

In addition, the definition of "predatory sea lion" adopted by the task force for identifying animals to be removed suggested that the task force had determined that removal of a single returning steelhead would have a significant negative effect on the fish population. The Commission recommended that, if the Service authorizes lethal removal under section 120, it should provide additional support for such a conclusion based on what is known about the population dynamics of the Lake Washington steelhead run.

Further, in this regard, the Commission noted that the "predation rate" that the task force recommended be used to trigger lethal removal apparently is to be calculated based on the estimated predation of both wild and hatchery steelhead. The Commission questioned including hatchery fish in this calculation. It recommended that a statistically reliable correction factor based on the relative percentages of hatchery and wild fish present at the Ballard Locks be included in any calculation used to trigger lethal removal.

To evaluate the feasibility of the task force's preferred alternative (temporarily holding predatory sea lions in captivity), the Commission recommended that the Service undertake immediately to identify available facilities for holding sea lions and other resources available for this purpose. In this regard, the Commission noted that the Service should not only look at existing facilities but also should identify possible sites where temporary pens could be constructed. The Commission requested that, before the Service authorizes lethal take of sea lions at Ballard Locks, the Commission be provided with the Service's analysis of the facilities that are available or that could reasonably be constructed to house sea lions temporarily, along with estimates of other costs associated with maintaining the sea lions in captivity, and be

afforded an opportunity to comment on the Service's evaluation and determination.

The majority report of the task force recommended a rather complicated mechanism for determining when lethal removal of sea lions should be triggered and suspended, and the rationale for the recommended formula was not readily apparent. In its letter, the Commission noted that, in order to assess the appropriateness of the recommended formula, it would be useful for the Service to provide an analysis, based on data from previous years, on how the formula would work in practice.

Section 120(c)(5) requires that, after implementation of an approved application, the Pinniped-Fishery Interaction Task Force evaluate the effectiveness of the actions that were implemented. A crucial factor in determining whether either lethal or non-lethal removal of predatory sea lions is effective is whether new sea lions move in to replace the animals that are removed. In its report, the task force recommended the removal of up to 40 predatory sea lions; it further recommended that the task force be reconvened if the number of removed animals reaches 20 or if 15 animals are lethally removed. In the Commission's opinion, inclusion of these thresholds suggested that the task force believed removal of animals would not be an effective solution if a large number of sea lions are involved.

In its letter, the Commission noted that it concurred with this view and that the information necessary to judge the effectiveness of removing individual sea lions can only be obtained empirically. The Commission further noted that, inasmuch as the effectiveness of removing sea lions should become apparent fairly quickly, the Service should make all possible efforts, at least initially, to use non-lethal removal techniques.

On 27 December 1994 the Commission was provided with a draft of the Service's environmental assessment regarding the recommendations of the task force. The transmittal letter indicated that, to complete the decision-making process by 1 January 1995 as had been recommended by the Commission, comments on the draft assessment would have to be provided to the Service no later than 29 December. The document could not be forwarded to the members of the Commission and its Committee of Scientific Advisors for review and comment in two days, as requested by the Service. Consequently, the Commission did not comment on the draft assessment.

Gulf of Maine Task Force

The 1994 amendments to the Marine Mammal Protection Act added a new Section 120(h) calling on the Secretary of Commerce to establish a pinniped-fishery interaction task force to advise on issues and problems regarding pinnipeds interacting in a dangerous or damaging manner with aquaculture resources in the Gulf of Maine. The Service is required to submit a report back to Congress no later than April 1996 describing recommended alternatives to mitigate such actions.

As discussed in previous annual reports, the 1988 amendments to the Marine Mammal Protection Act provided a limited five-year exemption from the Act's taking provision for most commercial fisheries. Under this exemption, certain fisheries in New England, including aquaculture fisheries, have been authorized to shoot at marine mammals to prevent damage to gear and catch. During reauthorization hearings, representatives of the New England aquaculture industry sought authorization to continue shooting harbor seals to prevent them from preying on salmon being raised in net pens. Such authorization was not part of the amendments as adopted.

At the annual meeting of the Marine Mammal Commission and its Committee of Scientific Advisors on 16-18 November in Falmouth, Massachusetts, the Commission was advised that the annual harbor seal population growth rate in waters off New England has been about eight percent for nearly two decades. The Commission was also advised that gray seals have re-established breeding colonies and the population may be growing rapidly in the New England area.

On 19 December 1994 the Commission wrote to the National Marine Fisheries Service noting these facts and further noting that expected continued growth of seal populations is likely to result in conflicts with the expanding aquaculture industry in New England. The Commission also noted that the aqua-

culture industry is not the only industry that potentially could be affected by increasing populations of harbor seals and gray seals.

For instance, the Commission noted that the gray seal is one of the hosts for the adult stage of the codworm, which, in larval form, occurs in the muscle tissue of many North Atlantic fish species, including the Atlantic cod. Heavy infestations can destroy the commercial value of the fish. While the relationship between the levels of codworm infestations in fish and the size of the gray seal and other host populations is uncertain, it has been the subject of much speculation. If the incidence of codworm infestation increases as the gray seal population increases, fishermen and others may assume a cause-effect relationship even though the assumption may be incorrect.

Similarly, because harbor seals and gray seals eat species of fish that are important to both commercial and recreational fisheries in the Northeast, it is possible that a decline in fish stocks, coinciding with an increase in seal populations, may lead to the assumption of a cause-effect relationship even though the assumption may be incorrect.

The Commission also pointed out that, as the seal populations grow, incidental mortality and injury in gillnet and other commercial fisheries are likely to increase. Again, a poor understanding of all the factors that may be involved will only serve to make the situation more difficult to assess.

Therefore, to increase the probability that problems are anticipated and addressed in ecologically and economically sound ways, the Commission recommended that the Service assess available information to determine (1) the types of marine mammal-fishery conflicts that are likely to arise from the continuing growth of gray seal and harbor seal populations in the Northeast; (2) when and where such conflicts are apt to occur; (3) additional information that is needed to make reasonable judgments concerning probable cause-effect relationships; (4) the research and monitoring programs that will be required to obtain the needed information; and (5) how best to avoid or mitigate conflicts and adverse impacts on the interacting fish stocks, fisheries, and marine mammal stocks.

Because such an assessment is essentially for the benefit of fisheries, the Commission recommended that the Service support the costs of the assessment and follow-up studies with funds appropriated for fishery-related programs, not protected species programs.

At the end of 1994 the Service had not yet responded to the Commission's 19 December letter. It was the Commission's understanding that the Service planned to establish the Gulf of Maine pinniped-fishery interaction task force early in 1995.

Fisheries-Related Litigation under the Marine Mammal Protection Act

In 1991 a Hawaiian fisherman was prosecuted under the Marine Mammal Protection Act for shooting in the direction of four dolphins to deter them from interacting with his gear and catch. A Federal magistrate tried and convicted the defendant for illegal taking under the Act. That conviction was affirmed by the U.S. District Court for the District of Hawaii. The defendant further appealed the conviction to the Ninth Circuit Court of Appeals on grounds of unconstitutional vagueness and insufficiency of the evidence.

The Court of Appeals reversed the conviction on 27 September 1993 (*United States* v. *Hayashi*). The court noted that the form of taking with which the defendant had been charged, "harassment," was not defined in the Marine Mammal Protection Act or by applicable regulation. To ascertain the term's meaning, the court examined the other elements of taking (hunting, capturing, and killing) included in the Act's definition of "take." Inasmuch as those elements all involve "direct, sustained, and significant intrusions upon the normal, life-sustaining activities of a marine mammal," the court concluded that "'harassment,' to constitute a 'taking'... must entail a similar level of direct and sustained intrusion." Reviewing the facts of the case, the court concluded that shooting at the porpoises did not have the significance or sustained effect to be a taking under the Act.

A dissenting opinion by one judge found that the majority, in order to overturn a conviction it thought

unreasonable, had unjustifiably restricted the breadth of the Act. The dissenting judge found "no source in the language, structure, or legislative history of the Act" to support "the gloss imposed by the majority" on the taking definition. Further, the judge thought that the majority's cramped construction of the term "taking" would unjustifiably "restrict most aspects of the scheme envisioned by Congress for the protection of marine mammals."

Concerned with the application of the *Hayashi* ruling to other factual settings and the implications of the ruling on its ability to enforce the Act effectively, the Government on 9 November 1993 petitioned the Court of Appeals to rehear the matter. While not objecting to the reversal of the conviction on other grounds, the Government took issue with the court's narrowing of the "take" definition.

In response, the appellate court on 26 April 1994 amended its ruling, deleting the requirement that a disruption of a marine mammal be of a sustained nature to constitute harassment. In light of the amended ruling, the majority voted not to rehear the case.

The 1994 amendments to the Marine Mammal Protection Act essentially eliminated the potential impact of the *Hayashi* ruling. Among other things, the amendments statutorily defined the term "harassment" to include any act of pursuit, torment, or annoyance that has the potential to injure or disturb a marine mammal or marine mammal stock in the wild.

Chapter VI

INTERNATIONAL ASPECTS OF MARINE MAMMAL PROTECTION AND CONSERVATION

Section 108 of the Marine Mammal Protection Act directs the Departments of Commerce, the Interior, and State, in consultation with the Marine Mammal Commission, to take such actions as may be appropriate or necessary to protect and conserve marine mammals under existing international agreements. It also directs them to negotiate additional agreements required to achieve the purposes of the Act. In addition, section 202 of the Act directs that the Marine Mammal Commission recommend to the Secretary of State and other Federal officials appropriate policies regarding international arrangements for protecting and conserving marine mammals.

The Commission's activities in 1994 with respect to international activities concerning marine mammal conservation are discussed below. During 1994 the Commission completed the compendium of international treaties and agreements bearing on the conservation of marine wildlife. The Commission also continued to devote attention to providing advice on U.S. positions regarding the International Whaling Commission, conservation of marine mammals and marine ecosystems in the Southern Ocean, development of an Arctic environmental protection strategy, international agreements on the conservation of polar bears, and regulation of international trade in marine mammals under the Convention on International Trade in Endangered Species of Wild Fauna and Flora. These activities are discussed below.

Compendium of International Treaties and Agreements

In 1991 the Marine Mammal Commission, after extensive consultation with governmental agencies, intergovernmental organizations, and non-governmental international organizations, decided to publish a successor document to the compendium of treaties and agreements compiled by the Congressional Research Service for the Senate Committee on Commerce, Science, and Transportation. Throughout the world, those consulted expressed dismay at the difficulty in finding basic reference documents and strongly supported the idea of an updated compendium. To help the Commission develop the document, a number of knowledgeable persons in the legal, academic, environmental, industrial, and governmental communities graciously agreed to serve on an Advisory Board to guide the *Compendium*'s development from its earliest stages.

The Marine Mammal Commission Compendium of Selected Treaties, International Agreements, and Other Relevant Documents on Marine Resources, Wildlife, and the Environment, current through 31 December 1992, contains the complete texts of more than 400 international agreements, including more than 100 multilateral treaties, agreements, accords, and memoranda of understanding. It also contains more than 90 bilateral treaties, agreements, and memoranda of understanding involving the United States and 31 other nations. Also included are numerous amendments and protocols to these documents, several non-binding international documents, and a number of agreements that are significant, but to which the United States is not party. Most of the bilateral agreements and non-binding documents are available here for the first time in a collection of international law.

The *Compendium* is divided into two sections comprising multilateral and bilateral documents. Within the multilateral section, documents are arranged by the following subjects: Antarctica, Environment and Natural Resources, Fisheries, Marine Mammals, Marine Pollution, Marine Science and Exploration, and Other. Within the bilateral section,

documents are arranged in alphabetical order by nation. Subheadings for the entries under each nation correspond to the subject headings given above.

Accompanying the text of each document is useful background information. For all multilateral entries, the *Compendium* includes primary source citations, the city in which the document was concluded, the date it was concluded, and, where applicable, the date it entered into force. For all treaties and international agreements, the depositary nation or organization is also provided.

Agreements in the *Compendium* that are noted as not being in force for the United States fall into three categories. They include agreements not yet signed by the United States, those for which the United States has not completed other steps necessary to become a party, and those agreements that by their terms limit participation to particular states or regions or establish other criteria that exclude the United States from becoming a party.

A number of agreements involving the former Soviet Union were in force at the time of that nation's dissolution. With respect to the United States, these agreements continue in force fully and equally as between the United States and each of the twelve successor republics unless continuance is determined by either party to be incompatible with the purposes of the agreement or otherwise inappropriate.

Documents in the *Compendium* were obtained from various U.S. Department of State publications; the U.S. Congress' Senate Treaty Documents, Senate Executive prints, and House Documents; the *United Nations Treaty Series*, published by the United Nations; the *European Treaty Series*, published by the European Community; the *League of Nations Treaty Series*, published by the League of Nations from 1920 to 1946; "Command Papers," published by Her Britannic Majesty's Stationery Office of the Government of the United Kingdom; the journal *International Legal Materials*, published by the American Society of International Law, Washington, D.C.; the journal *Environmental Policy and Law*, published by Elsevier Science Publishers; the U.S. Department of State's Office of the Assistant Legal Advisor for Treaty Affairs; other offices within the Department of State; the National Marine Fisheries Service; the United Nations Environment Programme; the Treaty Section of the United Nations Legal Department; the International Whaling Commission; the International Maritime Organization; the Inter-American Tropical Tuna Commission; the Intergovernmental Oceanographic Commission; the Secretariat for the Convention on the Conservation of Migratory Species of Wild Animals; the Secretariat for the Convention on International Trade in Endangered Species of Wild Fauna and Flora; the South Pacific Forum Fisheries Agency; the Organization of African Unity; and the Governments of Argentina, Australia, Belgium, Brazil, Finland, France, Germany, and Iceland.

From the outset, quality control was stressed. The size and complexity of the book mandated meticulous care and attention to detail at all stages if quality were to be realized. Basic guidance was provided by the Advisory Board in its reviews of content, structure, and format. Every document contained in the *Compendium*, if other than a photocopy of the signed original, was carefully reviewed for completeness and consistency with other versions before being scanned and typeset. Further review was undertaken by the U.S. Department of State to ensure accuracy and completeness of ancillary information and to ensure that relevant documents had not been overlooked. The front matter for all agreements was reviewed by the Advisory Board. During scanning and typesetting, every document was subject to strict quality control measures, including four separate proofreadings. A final review of the entire *Compendium* was done before it went to press.

Management of Highly Migratory Fish Stocks

During the ten-year negotiation of the Law of the Sea Convention, which became effective on 16 November 1994, high-seas fisheries conflicts were discussed at length. Recognizing that the language of the Law of the Sea Convention would benefit from elaboration, the parties to the 1992 United Nations Conference on Environment and Development called for "convening an intergovernmental conference under UN auspices with a view to promoting effective

implementation of the provisions of the Law of the Sea on Straddling and Highly Migratory Fish Stocks."

Straddling fish stocks are those that are found both within and beyond the Exclusive Economic Zones of individual coastal nations. Of particular interest to the United States are stocks of pollock in the Bering Sea, whose range overlaps U.S. and Russian waters and the high seas and which are part of an ecosystem of importance to a number of marine mammal species, and other commercially valuable species of fish. The Law of the Sea Convention itself lists highly migratory species, principally tunas, billfishes, oceanic sharks, and cetaceans, but does not address straddling stocks.

On 22 December 1992 the United Nations General Assembly adopted a resolution establishing the Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks. The resolution calls upon the Conference, drawing on scientific and technical studies by the United Nations Food and Agriculture Organization, to identify and assess existing problems related to the conservation and management of straddling fish stocks and highly migratory fish stocks; consider means of improving fisheries cooperation among States; and formulate appropriate recommendations. Since July 1993 the United Nations has sponsored three negotiating sessions aimed at developing international consensus on straddling stocks and highly migratory species conservation.

The United States has been an active participant in these discussions. At the third session, held at United Nations Headquarters in New York, the United States announced its support for a legally binding agreement. At the end of that session, the conference chairman presented a comprehensive draft agreement.

On 1 November 1994 the Marine Mammal Commission provided the Department of State extensive comments on the 24 August "Draft Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks." The Commission expressed support for several principles in the draft agreement, including the precautionary approach and an ecosystem perspective, in particular, and urged explicit reference to these principles in appropriate sections of the draft agreement. The Commission argued that the long-term conservation of living marine resources will not be possible unless their essential habitats and other components of the ecosystems of which they are a part are maintained in a healthy state.

The Commission also recommended more precise language regarding scientific evidence and expressed concern that the use of the term "the best scientific evidence available" can be interpreted in ways that create a high risk of over-harvesting and depleting both target and non-target species. The Commission also emphasized the importance of explicitly reflecting the risks and uncertainties arising from inadequacies of available scientific evidence, of making those data and analyses used in decision-making, as well as majority and minority views, available to the public and subject to peer review, and of collecting information independent of that collected in the course of commercial fishing operations. With respect to the last recommendation, the Commission noted that fishery-dependent information cannot be used to assess or detect the effects of fishing on populations that are dependent on the stocks being exploited.

The Commission also recommended that the language of the draft agreement be modified to ensure that socioeconomic factors are considered, not in setting maximum catch levels for either target or non-target species, but in adjusting these maximum catch levels for setting allowable take levels.

The Commission expressed particular concern at the widespread over-capitalization of the world's fishing fleets, which have been operating at an annual deficit of at least $22 billion, according to the UN Food and Agriculture Organization. The excessive number of vessels, together with the closure of Exclusive Economic Zones to distant-water fleets, has created pressure to exploit living marine resources wherever they are accessible. The Commission urged the Department of State to convene a conference of states and international organizations with a view to developing and implementing a strategy for reducing the size of the world's fishing fleets.

Finally, the Commission recommended language (1) to insure that fisheries do not develop more quickly than the information necessary for identifying proper conservation and management measures, (2) to provide that regional fisheries commissions consult with other international organizations, such as multilateral lending banks, regarding the effects of their activities, and (3) to insure fisheries commissions include consultation with relevant governmental, intergovernmental, and non-governmental organizations in developing policies and practices.

The fourth session of the Conference is scheduled for March 1995.

International Whaling Commission

The failure of the International Whaling Commission (IWC) to effectively regulate commercial whaling, and thus to allow whaling to endanger many stocks of whales, was one of the things that led to the Marine Mammal Protection Act and the establishment of the Marine Mammal Commission. Since it was established, the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, has conducted a continuing review of, and provided advice to the Department of Commerce and the Department of State on, measures necessary to restore depleted whale stocks and to ensure that commercial whaling does not cause any whale stock to be reduced or to be maintained below it optimum sustainable level. Activities related to the 1994 annual meeting of the IWC are described below.

Preparations for the 1994 IWC Meeting

The principal issues considered during the 1994 IWC meeting were the moratorium on commercial whaling, the revised management scheme, small-type coastal whaling, aboriginal subsistence whaling, scientific research whaling, the Southern Ocean Whale Sanctuary, illegal trade in whale meat, humane killing, threats from environmental degradation, whale-watching activities, and conservation of small cetaceans.

The U.S. Commissioner to the IWC, presently the Undersecretary of Commerce for Oceans and Atmosphere, has lead responsibility for the development and negotiation of U.S. positions on all matters related to the IWC. To assist in this regard, the National Oceanic and Atmospheric Administration holds a series of meetings each year to seek the views of government agencies, members of the public, and non-governmental organizations on matters related to the IWC. Any person with an identifiable interest in U.S. whale conservation policy may participate in these meetings. Foreign nationals and persons who represent foreign governments may not attend.

Meetings of this public interagency committee were held on 11 January, 11 March, and 27 April 1994 to seek views and review contemplated positions regarding the various issues to be considered at the 1994 meetings of the IWC and its Scientific Committee and subsidiary bodies. Members of the Marine Mammal Commission staff attended all meetings and worked with representatives of the National Oceanic and Atmospheric Administration to develop agreed positions on the issues noted earlier.

As described in previous annual reports, the IWC agreed to a moratorium on commercial whaling in 1982. The moratorium entered into effect during the 1985 pelagic and 1986 coastal whaling seasons. The agreement required that the IWC undertake a comprehensive assessment of the effects of the moratorium on previously exploited whale stocks and consider establishing a catch limit other than zero by 1990. In 1986 the IWC's Scientific Committee recommended, and the IWC approved, a work plan and timetable for conducting the comprehensive assessment. Subsequently, the Scientific Committee developed and in 1991 recommended a revised procedure for estimating allowable catch levels for individual stocks.

By letter of 9 June 1992 the Marine Mammal Commission advised the U.S. IWC Commissioner that it was not clear whether the recommended procedure would provide an adequate basis for ensuring that commercial whaling does not have significant adverse effects on either the affected whale stocks or the ecosystems of which they are a part. The Commission recommended that further studies be done to determine the sensitivity of the Revised Management

Procedure to the precision of the input parameters, including the precision and frequency of abundance estimates.

The National Marine Fisheries Service shared the Commission's concern and, as noted in the Commission's previous annual report, selected seven scientists with no previous involvement in IWC matters to do an objective, independent review of the Revised Management Procedure. This group met at the Service's Northeast Fisheries Science Center in Woods Hole, Massachusetts, on 25-29 October 1993.

The report of the independent scientific review panel was completed and made public in January 1994. The report noted that, as directed by the IWC, the main purpose of the Revised Management Procedure is to set catch limits that will (1) ensure that the risk of extinction of a stock is not seriously increased by exploitation, (2) ensure the highest possible yield, and (3) ensure stable catch quotas. It concluded that the proposed procedure for setting quotas could be used safely for a short period of time (no more than 20 years), after which a thorough review would be needed. It noted several deficiencies in the simulation trials that had been done to evaluate the procedure and recommended that additional trials be done as part of the implementation process to further assess the robustness of the procedure.

The panel report also noted that the Revised Management Procedure would separate the managerial decisions of setting catch limits from ongoing scientific research and evaluation. It noted that separating management from research could deflect interest away from scientific research and monitoring necessary to confirm that the procedure for setting quotas works as would be expected from the simulation trials if commercial whaling is resumed. The report was provided to the IWC's Scientific Committee for consideration in developing guidelines for implementing the Revised Management Procedure.

As noted in the Marine Mammal Commission's previous annual report, France proposed in 1992 that the IWC designate all Southern Hemisphere waters south of 40° S latitude as a sanctuary where commercial whaling would be prohibited. At the 1993 IWC meeting, the proposal was supported by a majority of the IWC members, but not by the three-quarters majority necessary for adoption. A resolution was adopted endorsing the concept of an Antarctic sanctuary and accepting an offer from the Government of Australia to host an intersessional meeting to formulate recommendations for consideration at the 1994 IWC meeting.

The intersessional meeting was held on Norfolk Island, Australia, on 20-24 February 1994. A variety of legal, political, and scientific issues were raised and discussed at the meeting. The meeting report provided the basis for the decision, discussed below, to establish the Southern Ocean Whale Sanctuary.

The 1994 Meetings of the IWC and its Scientific Committee

The 46th annual meeting of the IWC was held in Puerto Vallarta, Mexico, on 23-27 May 1994. Working groups and subcommittees met on 16-21 May; the Scientific Committee met on 2-14 May 1994.

The principal issues considered during the meeting were noted above. The results are summarized below.

The Revised Management Procedure and the Moratorium on Commercial Whaling — At its 1994 meeting, the IWC accepted by consensus resolution the Revised Management Procedure developed by the Scientific Committee to set catch limits for commercial whaling. The IWC also endorsed guidelines developed by the Scientific Committee for conducting and analyzing the results of abundance surveys, and for collecting and analyzing corollary information not required as direct input to use the Revised Management Procedure. As noted below, however, the IWC was unable to agree on a system for monitoring and enforcing compliance with catch limits and other conservation measures that may be established.

False reporting of the number and species of whales taken, and failure by some members to enforce compliance with conservation measures adopted by the IWC, were among the factors that led to the severe depletion of many exploited whale stocks. Therefore, the United States and most other members of the IWC

have taken the position that lifting the moratorium on commercial whaling should not be considered until an effective system for monitoring and enforcing compliance with catch limits, as well as a system for establishing catch limits, has been established.

A working group was established during the 1994 IWC meeting to consider an observation and inspection system proposed by Norway. The group made little progress, but did develop terms of reference for future work. The IWC agreed to convene an intersessional meeting of the working group in January 1995. Because of the failure to agree on a system of observation and inspection, no consideration was given to lifting the moratorium on commercial whaling.

As noted in the Marine Mammal Commission's previous annual report, Norway announced in May 1993 that it had authorized the commercial take of 160 minke whales in the North Atlantic even though the IWC's moratorium on commercial whaling remained in effect. In 1993 Norwegian whalers took 157 whales for commercial purposes and an additional 69 for research purposes (see below). During the 1994 IWC meeting, the United States and others urged Norway to stop all such whaling until the IWC lifted the moratorium.

Small-Type Coastal Whaling — Since 1986 Japan has argued that many of its small coastal communities depend upon whales and whaling in ways that are little different from aboriginal subsistence whaling, which is excluded from the moratorium on commercial whaling. At the 1994 IWC meeting Japan again requested an interim allocation of 50 minke whales for its small coastal whaling communities, pending completion and adoption of the Revised Management Scheme. As in the past, Japan was unable to satisfy concerns that products from whales taken by coastal villages would not be sold commercially. Consequently, the request did not receive the three-quarters majority vote required for adoption.

Aboriginal Subsistence Whaling — The IWC Schedule of Regulations includes catch limits for aboriginal subsistence whaling. At the 1994 meeting, the United States, at the request of the Alaska Eskimo Whaling Commission, proposed amending the schedule to allow Alaska Natives to take up to 204 bowhead whales during the four-year period (1995-1998). This proposal, which was accepted, increased from 41 to 51 the number of bowhead whales that could be landed each year by Alaska Natives. To encourage improvement in the efficiency of the hunt, the IWC limited the maximum number of strikes allowed to 68 in 1995, 67 in 1996, 66 in 1997, and 65 in 1998. (Additional information concerning the taking of bowhead whales by Alaska Natives for subsistence and cultural purposes is provided in Chapter IV.)

As noted in previous Commission reports, a commercial whaling vessel is used to take gray whales for Russian Natives. In 1991 the IWC established an annual catch limit of 169 gray whales for each of the years 1992, 1993, and 1994. In 1994 the Russian Federation requested a reduced catch limit of 140 gray whales per year for the three-year period 1995-1997. This request was approved.

In 1991 the IWC also set catch limits for fin whales and minke whales that could be taken by aboriginals in Greenland in 1992, 1993, and 1994. In 1994 Denmark requested (on behalf of Greenland) that the fin whale catch limit be decreased and the minke whale catch limit increased. The IWC approved annual catch limits for 1995-1997 of 19 fin whales from the West Greenland fin whale stock, 12 minke whales from the central North Atlantic minke whale stock, and 165 minke whales from the East Greenland minke whale stock.

During its 1994 meeting the IWC also passed a consensus resolution calling for the Scientific Committee to undertake a review of the procedures used to manage aboriginal subsistence whaling. The resolution instructed the Scientific Committee to investigate potential management regimes keeping in mind that the objectives are to (1) ensure that the risks of extinction to individual stocks are not seriously increased by subsistence whaling, (2) enable aboriginal people to harvest whales in perpetuity at levels appropriate to their cultural and nutritional requirements, subject to other objectives, and (3) maintain the status of stocks at or above the level giving the highest net annual recruitment and to ensure that stocks below that level are moved towards it, so far as the environment permits.

Scientific Research Whaling — The International Convention for Regulation of Whaling allows member nations to issue permits to its nationals authorizing the killing of whales for scientific purposes, provided research plans are submitted to the IWC's Scientific Committee for review and comment before the permits are issued. In 1986 and 1987 the IWC, acting on advice from its Scientific Committee, adopted guidelines for judging whether proposed takes for purported scientific purposes would contribute to making determinations necessary to further the IWC's conservation program.

At their 1994 meetings, the IWC and its Scientific Committee considered permits proposed to be issued by Japan and Norway to authorize the lethal taking of minke whales for purposes of scientific research. The Japanese permits would authorize the lethal take of 270-330 minke whales in Antarctic waters and 100 minke whales in the western North Pacific. The stated intent of the Antarctic research is to obtain better estimates of the natural mortality, discreteness, and productivity of Southern Hemisphere stocks of minke whales. The stated intent of the research in the western North Pacific is to obtain information necessary to establish catch limits for minke whales in the western North Pacific using the Revised Management Procedure.

The Norwegian permit would authorize the take of up to 127 minke whales in the eastern North Atlantic, as part of a three-year research program begun in 1993 to obtain better data on seasonal and geographic variation in minke whale feeding habits for use in a multispecies fisheries management model for the eastern North Atlantic.

The Scientific Committee questioned whether the proposed lethal taking would contribute to making determinations necessary to further the IWC's conservation program. The IWC adopted resolutions requesting that both countries reconsider their research whaling programs. These resolutions are non-binding and, as described below, both countries subsequently issued permits authorizing the proposed lethal taking.

Illegal Trade in Whale Meat — As described later in this chapter, there have been several reports of attempts to smuggle whale meat since the moratorium on commercial whaling came into effect in 1985/1986. At the 1994 IWC meeting, the United States proposed adoption of a resolution calling upon member nations to strictly enforce their obligations under the Whaling Convention and the Convention on International Trade in Endangered Species of Wild Fauna and Flora, and to observe fully earlier IWC resolutions prohibiting import of whale products from non-member countries. The resolution, co-sponsored by Argentina, Australia, Brazil, India, Monaco, and New Zealand, also invited members to report annually on the availability and sources of whale meat in domestic markets, on any intercepted shipments, and on other developments relevant to trade in whale meat or products. The resolution was adopted.

The Southern Ocean Whale Sanctuary — As noted earlier, France proposed in 1992 that the IWC designate all Southern Hemisphere waters south of 40° S latitude as a sanctuary in which commercial whaling would be prohibited. A number of technical and legal questions regarding the proposal were raised but could not be resolved at the 1992 and 1993 IWC meetings. Therefore, as noted earlier, an intersessional meeting was held on Norfolk Island, Australia, on 20-24 February 1994 to discuss and try to resolve the outstanding issues. During the intersessional meeting, a number of objections were raised concerning the proposed northern boundary of the sanctuary.

After extensive negotiations led by the United States, the IWC agreed at its 1994 meeting to establish an 11.8-million-square-mile sanctuary for whales in the Southern Hemisphere. The agreement was reached after a compromise boundary was proposed. In the agreed sanctuary, the proposed northern boundary of 40° S latitude is followed in most of the Atlantic and Pacific Oceans, but around South America it dips to 60° S. In the Indian Ocean it dips to 55° S, but is contiguous with the Indian Ocean Sanctuary, established in 1979. Figure 4 shows both the Indian Ocean and Southern Ocean whale sanctuaries.

Japan was the only country to vote against the sanctuary.

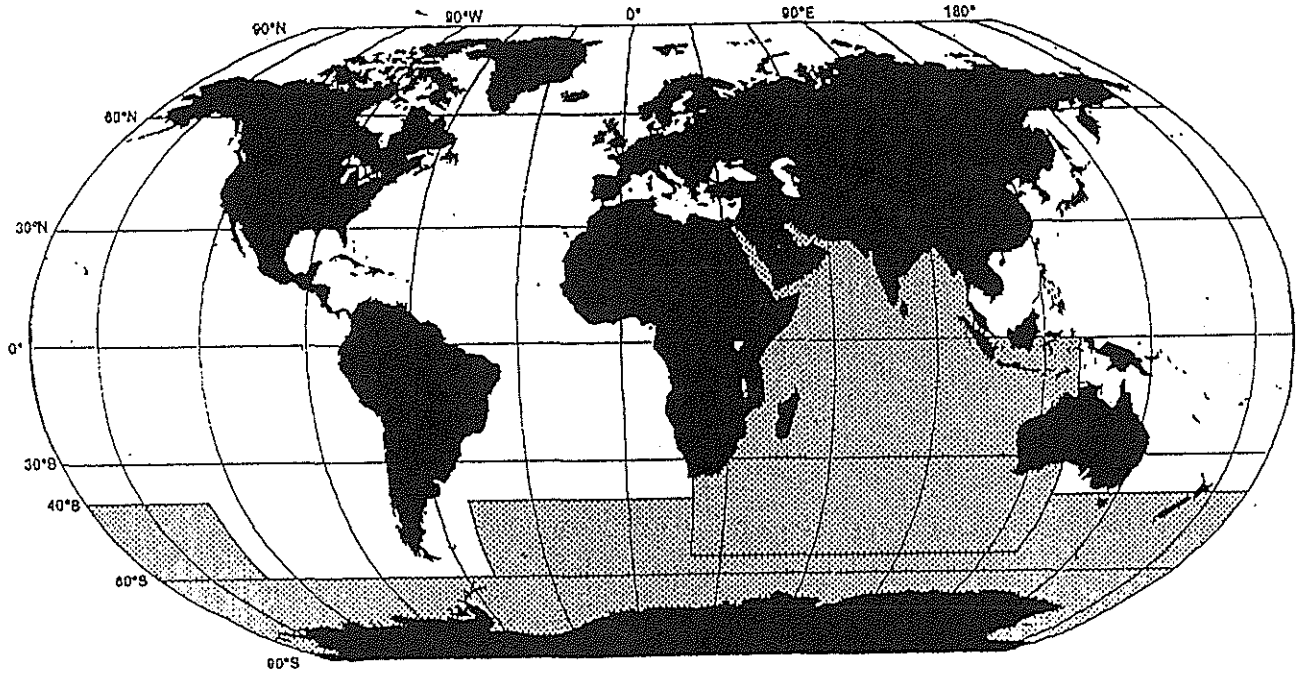

Figure 4. Boundaries of the Southern Ocean and Indian Ocean Sanctuaries

Humane Killing — The IWC has a technical working group charged with examining and providing advice on the humaneness of various means of killing whales. This group generally meets in advance of the annual IWC meetings to review information provided by member nations concerning measures taken to implement more humane killing methods. As noted in the Marine Mammal Commission's annual report for 1992, a workshop on humane killing methods was held prior to the IWC's 1992 annual meeting. The workshop recommended an 11-point action plan, subsequently endorsed by the IWC, to further assess and develop more humane methods for killing whales.

During the 1994 meeting of the Humane Killing Working Group, Norway reported that 50.4 percent of the 226 minke whales it had taken in 1993 for commercial and scientific purposes ceased to show any sign of life within 10 seconds after being harpooned. The United States reported that in the 1993 bowhead hunt by Alaska Natives, 80 percent of the whales that were struck were landed, demonstrating the continuing efforts by the Alaska Eskimo Whaling Commission to minimize the number of whales struck but lost.

New Zealand presented information questioning the humaneness of the electric lance used by Japanese whalers as a means for hastening the death of whales that are harpooned. The IWC adopted a resolution calling for further assessment of the humaneness of the electric lance as a secondary killing method. On a related matter, the IWC agreed to hold a workshop on whale-killing methods in 1995. The terms of reference for the workshop are to consider and assess all methods of killing whales currently in use, to evaluate the time-to-death achieved by the various killing methods, and to complete a comparative analysis of killing methods, with a view toward improving their humaneness while paying proper regard to the safety of the whalers.

Possible Impacts of Environmental Change — As noted in previous annual reports, the Marine Mammal Commission's 5 December 1991 and 9 June 1992 letters to the U.S. IWC Commissioner pointed out that whale stocks throughout the world may be affected by environmental pollution and a variety of other things in addition to commercial exploitation. The IWC has recognized this and at its 1992 meeting asked its Scientific Committee to establish a regular

agenda item to address the possible impact of environmental change on whale stocks. It also asked the Scientific Committee to initiate consultations with other relevant organizations.

At its 1993 meeting, the IWC adopted a resolution calling for a special workshop to be held on this topic before the 1995 IWC meeting. In addition, the IWC instructed its Scientific Committee to give priority to assessing the effects of environmental change on cetaceans in order to advise the Commission on appropriate response strategies.

At its 1994 meeting, the Scientific Committee identified several things that could affect whales by affecting their habitat. These include global warming, ozone depletion, pollution, direct and indirect effects of fisheries, noise, and other human activities. The Scientific Committee proposed to give priority to the first three factors and, towards this end, to hold two intersessional workshops to assess the possible effects of pollution and climate change on cetaceans.

The IWC endorsed the Scientific Committee's proposal. The first workshop is scheduled to be held in Bergen, Norway, in March 1995. The second workshop will be held in 1996 at a time and place not yet decided.

Whale-Watching Activities — In the past decade there has been a substantial increase in commercial whale-watching enterprises throughout the world, including in countries advocating resumption of commercial whaling. At its 1993 meeting the IWC adopted a resolution that (1) invited contracting parties to undertake preliminary assessments of the extent and the economic and scientific values of whale-watching activities in their countries and to report back to the Commission by 31 January 1994, (2) requested that the IWC secretariat consolidate and provide a report to the 1994 IWC meeting summarizing the information submitted by contracting parties, and (3) established a working group to consider and make recommendations to the Commission for follow-up action.

At the 1994 IWC meeting, the secretariat provided a report summarizing the information provided by the contracting parties. Also, the Working Group on Whale Watching met for the first time. Although Japan expressed the view that whale-watching was outside the competence of the IWC, all countries were willing to discuss areas of mutual concern. In this regard, the working group noted that questions concerning the possible impacts of whale-watching on whales had both a scientific and management component. It asked that the Scientific Committee identify and assess methods for determining the potential effects of whale-watching on whales.

While acknowledging that regulation of whale-watching activities is the responsibility of coastal states, the IWC agreed that it should provide advice to both member and non-member governments on data needed to assess and measures needed to avoid the possible adverse effects of whale-watching operations. It also agreed that the Working Group on Whale Watching should meet before the 1995 IWC meeting to prepare a framework for possible whale-watching guidelines that might be adopted at a future IWC meeting. The IWC also requested that the Scientific Committee provide the information and analyses requested by the working group.

The working group is scheduled to meet again on 25 May 1995.

Small Cetaceans — Many species and populations of small cetaceans (dolphins and porpoises) have been seriously depleted by directed taking and other human activities. Whether the IWC has authority to set catch limits for small cetaceans has been a subject of contention since the late 1970s. A number of countries, including the United States, believe that the International Whaling Convention clearly provides authority for the IWC to establish catch limits for any cetaceans. Other countries strongly disagree, believing that such regulation would be inconsistent with the rights of coastal states to regulate exploitation of natural resources within their Exclusive Economic Zones.

Although the IWC has been unable to reach agreement on the issue of authority, it has recognized that many species and populations of small cetaceans are in serious trouble due to directed taking, incidental take in commercial fisheries, and habitat degradation and destruction. In 1980 the IWC adopted a resolution (1) noting that the question of its competence

over small cetaceans was not resolved, (2) recommending that the Scientific Committee continue to consider and to provide advice to contracting governments and others on measures necessary to effectively conserve species and populations of small cetaceans, and (3) inviting all contracting governments to take into account the advice provided by the Scientific Committee.

At its 1992 meeting, the IWC agreed to establish a Small Cetacean Working Group. This group met for the first time in 1993. As noted in the Marine Mammal Commission's previous annual report, the IWC adopted a resolution in 1993 setting forth topics for future discussion by this working group.

At its 1994 meeting, the Small Cetacean Working Group reviewed the way in which the Scientific Committee's Subcommittee on Small Cetaceans identifies species and stocks for review. The working group concluded that priority should be given to endangered species, to species or stocks under specific threat from direct or indirect take, or from pollution or habitat degradation, and to global and regional reviews of the status of small cetacean populations and related management issues. The working group also discussed possible means for encouraging and ensuring coastal state participation in small cetacean research and status reviews.

Two resolutions were adopted. The first called for continuing efforts to assess and resolve problems facing small cetacean stocks. It established a voluntary fund to enable scientists from developing countries to participate in future meetings and workshops regarding small cetaceans. The second resolution concerned the vaquita (Gulf of California harbor porpoise), which occurs only in the upper Gulf of California, Mexico. It noted the small size of this population and that current levels of incidental catch in fisheries could cause its extinction. It commended the Government of Mexico for establishing the biosphere reserve, which includes the upper Gulf of California and the Colorado River Delta, and it encouraged Mexico to expeditiously develop a management plan for the reserve.

The Scientific Committee, noting the extremely small population size and an incidental take rate higher than previously thought, recommended that "immediate action be taken to eliminate incidental catches." The Committee also recommended that an in-depth review of harbor porpoise in the North Atlantic be undertaken at its next annual meeting.

Post-Meeting Activities

The Southern Ocean Sanctuary — As noted earlier, Japan voted against establishment of the Southern Ocean Sanctuary. On 12 August 1994 Japan lodged a formal objection to the sanctuary and, under the provisions of the Whaling Convention, it is not bound to comply with the prohibition on whaling in the sanctuary. On 5 September 1994 the Russian Federation also filed an objection to the sanctuary. The United States and other countries urged both Japan and the Russian Federation to withdraw their objections. The Russian Federation did so on 14 October 1994. Japan has not withdrawn its objection.

The sanctuary came into effect on 6 December 1994 and is binding on all IWC members except Japan.

Norwegian Whaling — During the summer of 1994 Norway continued both commercial and research whaling on minke whales in the northeast Atlantic. It established for itself a quota of 189 whales for the commercial catch and, as noted earlier, a quota of 127 for the research catch. Midway through the summer these quotas were revised to allow the take of 226 whales for commercial purposes and 95 for research purposes. Commercial whaling was done between June and August, while research whaling was done during three separate periods between May and September. The total 1994 take was 206 whales for commercial purposes and 95 for research purposes.

Canadian Aboriginal Subsistence Whaling — As discussed in Chapter IV, Canada issued a permit in August 1991 authorizing the Inuvialuit community of Aklavik to kill one or strike two bowhead whales. Subsequently, one bowhead whale was struck and killed. Canada, which withdrew from the IWC in 1982, authorized the bowhead take without consulting the IWC.

In 1994 Canada again issued a permit allowing the take of one bowhead whale in the western Canadian Arctic. The United States views this action as "diminishing the effectiveness" of the IWC's conservation program. It therefore called upon Canada to revoke the license and to rejoin the IWC. A hunt was conducted in the fall of 1994, but no bowhead whales were taken.

In 1994 a Canadian Native took a bowhead whale without government permission from the severely depleted Davis Strait stock. At the end of 1994 Canada had taken no action to rejoin the IWC. Further, it had not indicated what was planned with regard to allowing future hunting of bowhead whales by Canadian Natives.

Japanese Research Whaling — As noted earlier, Japan indicated during the 1994 IWC meeting that it intended to issue permits authorizing the lethal take of 100 minke whales in the western North Pacific and 270-330 minke whales in the Antarctic for purposes of scientific research. In the western North Pacific, only 21 of the proposed 100 minke whales were subsequently taken. Japan reported to the United States that the low take was due primarily to its inability to obtain access to the Russian Exclusive Economic Zone. Also, bad weather was encountered and the whales were more difficult to approach than those taken in Antarctic operations.

Japan's research fleet left for the Antarctic on 10 November 1994. At the end of 1994 there had been no reports of the number of minke whales taken in the Antarctic.

Conservation and Protection of Marine Mammals in the Southern Ocean

At least 13 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) and regional populations of humpback, blue, fin, sei, and sperm whales were, and in some cases remain, severely depleted as a result of unregulated or poorly regulated commercial hunting.

There has been no commercial sealing in the Antarctic since the 1950s. Further, 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 an agreed mechanism for regulating commercial sealing in the Antarctic, should it ever be resumed.

As noted in the earlier discussion in this chapter on the International Whaling Commission, a moratorium on commercial whaling currently is in effect and much of the Southern Ocean has been designated a whale sanctuary. Also, the Antarctic Treaty Protocol on Environmental Protection, discussed below, would prohibit oil and gas development and other mineral resource activities in Antarctica for at least 50 years. Therefore, commercial sealing, commercial whaling, and mineral exploration and development do not currently pose threats to Southern Ocean populations of seals and whales. However, it is possible that commercial sealing and whaling could be resumed and that mineral exploration and development could be permitted in the future. If not properly regulated, such activities could adversely effect Southern Ocean populations of seals and whales. Also, expansion of fisheries, particularly the fishery for Antarctic krill (*Euphausia superba*), could adversely effect seals, whales, and other species dependent upon the exploited fish and krill stocks as their primary food source. In some areas, construction and operation of science stations and increasing tourism may also pose threats.

Because of the possible direct and indirect effects of fisheries and other activities on marine mammals, the Marine Mammal Commission conducts a continuing review of matters that might affect marine mammals, krill, or other components of the Southern Ocean ecosystem upon which marine mammals may depend. It has made recommendations to the National Science Foundation, the Department of State, the National Oceanic and Atmospheric Administration, and the National Marine Fisheries Service on the need for research and international agreements to effectively regulate sealing, whaling, fisheries, mineral re-

source exploration and development, and other activities in Antarctica and the surrounding seas.

Commission representatives participate in interagency meetings to develop U.S. policy regarding activities in Antarctica and the surrounding seas. Commission representatives have served as advisors on many of the delegations to Antarctic Treaty Consultative meetings and meetings of the Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources.

Activities and background information concerning activities carried out in 1994 are described below.

Protocol on Environmental Protection to the Antarctic Treaty

As noted in the Marine Mammal Commission's previous annual report, a Protocol on Environmental Protection to the Antarctic Treaty was concluded by the Antarctic Treaty Consultative Parties in October 1991. The Protocol includes four annexes which specify obligations and requirements regarding (1) assessment in the planning stages of the possible environmental impacts of activities to be conducted in Antarctica, (2) conservation of Antarctic fauna and flora, (3) waste disposal and management; and (4) prevention of marine pollution. A fifth annex, setting forth obligations and requirements for protection and management of special areas, was adopted at the XVIth Antarctic Treaty Consultative Meeting. Article 11 of the Protocol provides for the establishment of a group of scientific and technical experts, the Committee for Environmental Protection, to provide advice on measures needed, and the effectiveness of measures taken, to implement the Protocol.

The basic intent of the Protocol is to improve the effectiveness of the Antarctic Treaty as a mechanism for protecting the Antarctic environment and for ensuring that the Antarctic does not become the scene or object of international discord. It will enter into force when it has been ratified by all 26 of the current Antarctic Treaty Consultative Parties. When it enters into force, it will designate Antarctica as a natural reserve, devoted to peace and science, and establish general principles and legally binding obligations to protect the Antarctic environment. As noted earlier, it will prohibit any activities relating to mineral exploration and development for at least 50 years.

At the end of 1994, 14 countries had ratified the Protocol (Argentina, Australia, Chile, China, Ecuador, France, Germany, The Netherlands, New Zealand, Norway, Peru, Spain, Sweden, and Uruguay). The U.S. Senate provided its advice and consent on ratification in October 1992. However, as a matter of general practice, the United States will not formally ratify the Protocol until legislation has been enacted to provide the statutory authority to implement its provisions. By the end of 1994 implementing legislation had not yet been enacted.

XVIIIth Antarctic Treaty Consultative Meeting

Article 9 of the Antarctic Treaty specifies that representatives of the treaty parties shall meet periodically to exchange information, consult with each other, and consider and recommend to their governments measures to further the principles and objectives of the Treaty. Since the Treaty became effective in 1961, there have been 18 regular consultative meetings and 11 special consultative meetings. Regular consultative meetings, which beginning in 1995 will be held annually, provide a mechanism for reviewing and determining measures needed to better implement the Treaty and other components of the Antarctic Treaty system. Special consultative meetings provide a mechanism for dealing with resource and other issues not covered by the Antarctic Treaty. For example, the Convention on the Conservation of Antarctic Marine Living Resources, the Convention on Regulation of Antarctic Mineral Resource Activities, and the previously mentioned Protocol on Environmental Protection to the Antarctic Treaty were negotiated at special Antarctic Treaty consultative meetings.

The XVIIIth regular Antarctic Treaty Consultative Meeting was held in Kyoto, Japan, on 11-22 April 1994. Items considered during this meeting included tourism and non-governmental activities in the Antarctic Treaty area, establishment of a permanent secretariat to facilitate information exchange and help organize consultative meetings, entry into force and implementation of the Protocol on Environmental

Protection, environmental impact assessment and monitoring, and inspections under the Antarctic Treaty.

Tourism and Non-Governmental Activities — Until 1966 nearly all expeditions to the Antarctic were for scientific purposes and either were organized or had some measure of backing by one or more of the Antarctic Treaty Consultative Parties. In 1966 the first commercially organized tourist expedition occurred. Since then, there has been a slow but consistent increase in tourism and other non-governmental activities (*e.g.*, yachting and mountain climbing) in the Antarctic. In 1991 and 1992 the number of tourists and adventurers visiting Antarctica surpassed the number of scientists and support personnel working there.

Tourism and non-governmental activities can interfere with scientific research and, like other activities, may have adverse impacts on the Antarctic environment. The Antarctic Treaty Consultative Parties have recognized these possibilities and have adopted a number of measures to govern tourism and non-governmental activities as well as governmental activities in the Antarctic. In 1975, for example, the Antarctic Treaty Consultative Parties adopted a "Statement of Accepted Principles and Guidance for Visitors to the Antarctic."

As noted in the Marine Mammal Commission's 1992 annual report, several Antarctic Treaty Consultative Parties questioned the adequacy of the measures that have been taken to regulate tourism and other non-governmental activities and, at the XVIth and XVIIth Antarctic Treaty Consultative Meetings, proposed adding an annex to the Antarctic Treaty Protocol on Environmental Protection to explicitly address tourism and other non-governmental activities. These parties argued that a high-visibility annex that synthesizes the relevant provisions of the Protocol and creates additional restrictions on non-governmental visitors to Antarctica was necessary to ensure that such activities do not interfere with science or adversely affect the Antarctic environment.

The United States and others pointed out that the Protocol on Environmental Protection applied to all activities in Antarctica, including tourism and other non-governmental activities, and that the draft annex that had been proposed contained provisions inconsistent with both the Protocol and the Antarctic Treaty. For example, the proposed annex included provisions that would prohibit non-governmental activities in Antarctica without prior approval of the Consultative Parties, restrict tourists to specific locations, and limit the number of tourists that can visit Antarctica.

These differences could not be resolved at the XVIth and XVIIth Consultative Meetings. At the latter meeting it was agreed to consider the matter further at the XVIIIth meeting. To help prepare for discussion of this issue, the Marine Mammal Commission, in cooperation with the Department of State, contracted with a person familiar with the Antarctic tourist industry to prepare a background paper and draft a proposal for updating the 1975 "Guidance for Visitors to Antarctica" as a means for giving effect to those provisions of the 1991 Protocol on Environmental Protection bearing directly on tourism, adventure travel, and other non-governmental activities in Antarctica.

The contractor's report was translated into a working paper and circulated informally at the Consultative Meeting in Kyoto. It was used as the basis for revising the 1975 "Guidance for Visitors to the Antarctic" and to develop "Guidance for Those Organizing and Conducting Tourism and Non-Governmental Activities in the Antarctic." The meeting participants adopted a recommendation calling upon their governments to circulate the agreed guidelines and to urge those persons intending to visit or to organize and conduct tours and other non-governmental activities in the Antarctic to act accordingly. Among other things, the guidelines describe actions that should be taken to protect wildlife in Antarctica, to avoid interfering with scientific research or affecting areas that have been afforded special protection, and to ensure that visitors are aware of and prepared to deal with harsh and unpredictable weather in the Antarctic.

The contractor also is to design and carry out a field test to determine how best to ensure that visitors are aware of and comply with the updated guidelines. The report from that effort is due early in 1995.

Antarctic Treaty Secretariat — Antarctic Treaty consultative meetings are organized and hosted by the consultative parties on a rotating basis. Information concerning member states' activities in Antarctica is shared through an annual information exchange. The number of treaty parties and international interest in Antarctica have both increased substantially since the Treaty was concluded in 1959. In recent years, there has been growing recognition that both the information exchange and organization of meetings could be enhanced by establishing a small, permanent secretariat. It also is recognized that effective implementation of the Protocol on Environmental Protection will require a permanent secretariat to, among other things, support the work of the Committee on Environmental Protection to be established when the Protocol enters into force.

At the XVIIth Consultative Meeting, agreement was reached in principle on the need for and the general functions of a small secretariat. Further discussions were held at the XVIIIth meeting in Kyoto. Although the need for a permanent secretariat was widely recognized, it was not possible to reach consensus on where it should be located, how it should be funded and staffed, or what legal status it should be afforded. The meeting participants urged that consultations be held during the intersessional period, with a view to reaching a consensus as soon as possible. The matter will be considered again at the next consultative meeting.

Entry into Force and Implementation of the Protocol on Environmental Protection — During the XVIIIth Consultative Meeting, it was noted that only nine of the 26 Antarctic Treaty Consultative Parties had ratified the Protocol, namely Argentina, Australia, Ecuador, France, The Netherlands, Norway, Peru, Spain and Sweden. Parties, like the United States, that had not done so were urged to complete the process necessary to ratify and implement the Protocol and its annexes as soon as possible.

As noted earlier, Article 11 of the Protocol provides for the establishment of a Committee for Environmental Protection to help identify and oversee implementation of measures to give effect to the Protocol. During the XVIIIth Consultative Meeting, several consultative parties proposed establishing the committee on an interim basis to begin considering and providing advice on actions that will be required to promptly give effect to the Protocol when it enters into force. It was agreed that a transitional environmental working group would be established and that, at future consultative meetings, this working group would consider agenda items that likely would be referred to the Committee for Environmental Protection once the Protocol enters into force. This working group, which will include representatives of the Scientific Committee on Antarctic Research and other components of the Antarctic Treaty system (*e.g.*, the Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources), will meet during the first week of the XIXth Antarctic Treaty Consultative Meeting to be held in Seoul, South Korea, on 8-19 May 1995.

The Marine Mammal Commission will work with the Department of State, the National Science Foundation, the National Oceanic and Atmospheric Administration, and other interested agencies and public interest groups to ensure effective U.S. representation and input into the work of the transitional working group.

Environmental Impact Assessment and Monitoring — When it enters into force, the Protocol on Environmental Protection will require that parties assess the possible environmental impacts of their activities in Antarctica during the planning stages. It will also require that parties institute environmental monitoring programs to ensure that their activities in Antarctica do not have unacceptable environmental impacts as described in Article 3 of the Protocol. As noted in the Marine Mammal Commission's 1992 annual report, a meeting of experts on environmental monitoring was held in Buenos Aires, Argentina, in June 1992 to identify the types of activities most likely to have unacceptable impacts on the Antarctic environment, and describe the types of research and monitoring programs that would be required to detect possible adverse effects.

The report and recommendations from the meeting of experts on environmental monitoring were considered at the 1992 Antarctic Treaty Consultative Meeting. To follow up on some of the recommendations, the Antarctic Treaty Consultative Parties asked the

Scientific Committee on Antarctic Research to consider and provide advice on (1) the types of long-term programs, if any, necessary to verify that human activities in Antarctica do not have significant adverse effects on Antarctic flora and fauna, and (2) emission standards that should be established to ensure that the combustion of fossil fuels and incineration of waste do not contaminate the Antarctic environment in any way that would compromise its scientific value. The Consultative Parties also asked that the Council of Managers of National Antarctic Programs (COMNAP), in consultation with the Scientific Committee on Antarctic Research (SCAR), establish research programs at a representative subset of facilities in Antarctica to determine how different types and sizes of facilities in different localities affect the Antarctic environment.

At the Consultative Meeting in 1994, SCAR and COMNAP provided a joint report on steps that they have taken to respond to the requests from the XVIIth Consultative Meeting. In addition, SCAR and COMNAP proposed convening a series of technical workshops to consider and provide advice on specific methods and equipment for monitoring selected indicator variables. The meeting participants endorsed this proposal and worked with the SCAR and COMNAP representatives to develop agreed terms of reference.

At the end of 1994 plans for the workshops had not yet been finalized.

Inspection — Article 7 of the Antarctic Treaty provides that all areas of Antarctica, including all stations, installations, and equipment within those areas, and all ships and aircraft at points of discharging or embarking cargoes or personnel in Antarctica shall be open at all times to inspection by observers designated by any contracting party. Concerned about the possible effects of increasing human presence on the Antarctic environment, the United States developed and, during inspections carried out in 1989, used a checklist to ensure inspection of all aspects of the construction and operation of the stations visited that could affect the Antarctic environment. This checklist was provided to other Treaty Parties at the XVth Consultative Meeting in 1989 and subsequently was used and modified by several parties to help plan and conduct their own site inspections in Antarctica.

In 1992 the Scientific Committee on Antarctic Research (SCAR) and the Council of Managers of National Antarctic Programs (COMNAP) were asked to prepare a recommended inspection checklist to assist in assessing compliance with the provisions of the Protocol on Environmental Protection as well as the Antarctic Treaty. The SCAR/COMNAP recommendations were provided to and used by the Consultative Meeting to develop an agreed checklist to assist in planning and conducting future inspections. The meeting participants also agreed that checklists should be developed to guide inspections of abandoned bases, waste-disposal sites, ships (including tour ships), and areas that have been afforded special protection in Antarctica.

Activities Related to Marine Living Resources

As noted in previous Commission annual reports, several countries began experimental fisheries for krill and finfish in the Southern Ocean in the 1960s. Concerns that those fisheries, particularly the krill fishery, could adversely affect seals, whales, and other non-target species, as well as target species, led the Antarctic Treaty Consultative Parties to negotiate and adopt the Convention on the Conservation of Antarctic Marine Living Resources.

The Convention was concluded in May 1980 and entered into force in April 1982. Among other things, it established the Commission and the Scientific Committee for the Conservation of Antarctic Marine Living Resources. These bodies have met annually since 1982. The Marine Mammal Commission's involvement in negotiation of the Convention and the first 12 meetings of the Commission and Scientific Committee are described in previous annual reports.

The 13th meetings of the Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources were held in Hobart, Tasmania, Australia, from 24 October to 4 November 1994. The principal results of the meetings are summarized below.

[*Meeting reports and other information concerning the Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources can be obtained by writing the Commission for the Conservation of Antarctic Marine Living Resources, 25 Old Wharf, Hobart, Tasmania, 7000, Australia.*]

The Krill Fishery — The total commercial krill catch reported in 1993-1994 was 83,818 metric tons (mt), down slightly from the reported catch of 88,776 mt in 1992-1993, and down substantially from the highest reported catch (528,201 mt) in 1981-1982. Most of the catch was from statistical areas 48.1, 48.2, and 48.3, (the areas around Elephant Island, the South Sandwich Islands, and South Georgia Island). The largest catch (62,322 mt) was by Japan. Other countries reporting krill catches were Chile (3,834 mt), Latvia (71 mt), Poland (7,915 mt), Russia (965 mt), South Africa (3 mt) and the Ukraine (8,708 mt). The decline in catch in recent years has been due primarily to reduction of fishing effort by countries that were members of the former Soviet Union.

As noted in the Marine Mammal Commission's previous annual reports, the Scientific Committee for the Conservation of Antarctic Marine Living Resources established a Working Group on Krill in 1988 to consider and provide advice to the Scientific Committee on measures needed to estimate the biomass and potential yield of krill stocks in different geographic areas. Acting on advice provided by this working group, the Scientific Committee recommended and in 1991 the Commission adopted a 1.5-million-metric-ton limit on the catch of krill in statistical area 48. In 1992 the Commission adopted a precautionary catch limit of 390,000 mt in statistical division 58.4.2 (the Prydz Bay area, south of Australia), and agreed that sub-area quotas should be established if the total catch in sub-areas 48.1, 48.2, and 48.3 exceeds 620,000 mt in any year.

The Working Group on Krill has developed and proposed adoption of a model for estimating the potential krill yield in different areas. Re-analysis of krill biomass data, done by the working group in 1994 using the model, suggested that the 1.5-million-metric-ton precautionary limit on the krill catch in statistical area 48 could be increased to 4.1 million tons. The data used in the analysis are more than ten years old. Also, the model is a single-species model and incorporates a number of assumptions concerning the discreteness and productivity of krill stocks and their relationships with krill predators that cannot presently be verified. The Commission, noting the uncertainty and that current catch levels are well below the present precautionary catch limit, decided that the present 1.5-million-metric-ton precautionary catch limit should remain in effect. The Commission urged the Scientific Committee to continue efforts to estimate potential yield and precautionary catch limits for all areas.

This is an extremely important issue and in 1995 the Marine Mammal Commission will continue to work with the National Marine Fisheries Service and the Department of State to (1) ensure that the best available data and models are used to estimate the levels of krill harvest that can be sustained in different areas without adversely affecting marine mammals and other krill-dependent species, and (2) determine the krill and predator monitoring programs necessary to confirm that authorized catch levels do not have unacceptable impacts on either krill or dependent predator stocks.

Finfish Fisheries — The only finfish species taken in directed fisheries in the convention area in 1993-1994 were Patagonian toothfish (*Dissostichus eleginoides*), and lantern fish (*Electrona carlsbergi*). The total catch of *D. eleginoides* was 5,686 mt (603 mt by longliners in statistical area 48.3; 942 mt by longliners in statistical area 58.1; and 4,141 mt by trawlers in statistical area 58.1). Twelve tons of skates and rays were reported as a bycatch of the longline fishery in statistical area 48.3. The total catch of lantern fish (myctophids) was 114 tons, all in statistical area 48.3.

The total reported catch was similar to the 5,810-mt catch reported in 1992-1993. It was far below the 58,218 mt reported caught in 1991-1992 and nearly an order of magnitude less than the estimated catch of 399,704 mt in 1970. Unlike the decline in krill catches, the decline in finfish catches has been due to overfishing, which occurred mostly before 1981 when the Convention entered into force, not reduction of fishing effort.

Incidental Mortality — As noted in Chapters V and VIII of this report, many marine mammals, seabirds, and other non-target species are caught incidentally in commercial fisheries. Many also are caught and killed in lost and discarded fishing gear, and die from eating plastics and other debris discarded at sea.

As noted in the Marine Mammal Commission's previous annual reports, the Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources have taken a number of steps to assess and prevent such incidental mortality. Among other things, the Living Resources Commission has developed, and the secretariat has distributed, a placard to be displayed in prominent places aboard ships operating in the convention area to ensure that fishermen, researchers, and others working in the convention area are aware of hazards posed by lost and discarded fishing gear and other potentially hazardous marine debris, and what they can do to prevent such debris from being lost and discarded at sea.

Scientific observers aboard fishing vessels operating in the convention area in 1993-1994 reported that some vessels were not displaying the placard. The secretariat therefore was asked to inquire if members needed more placards for their vessels and, if so, to produce and distribute more copies.

At the 1993 meeting of the Scientific Committee, it was agreed that an *ad hoc* working group would be constituted and meet before the 1994 meeting to review information concerning incidental mortality of seabirds in longline fisheries. The working group met on 21-22 October 1994. It concluded that substantial numbers of seabirds are being caught and killed in longline fisheries both within the convention area and in adjacent waters. It also concluded that the level of take could be sufficient to pose a risk to breeding colonies of albatrosses and white-chin petrels in the convention area. The working group recommended, and the Commission adopted, measures to better assess and reduce seabird mortality incidental to longline fisheries in the convention area. The Commission also requested that the secretariat contact the United Nations Food and Agriculture Organization and organizations responsible for managing fisheries in waters adjacent to the convention area, to call attention to the problem, exchange information, and determine steps that might be taken collectively to prevent impacting Antarctic seabird populations.

New and Exploratory Fisheries — One of the principal impediments to effective fishery management is that fisheries often develop faster than the information base necessary to estimate sustainable yield levels. As noted in previous Marine Mammal Commission annual reports, the National Marine Fisheries Service issued a permit in 1990 authorizing a Seattle-based fishing vessel to conduct exploratory fishing for king crabs and stone crabs in the Antarctic during the 1990-1991 fishing season. Although the permit and permitting procedure complied fully with all existing conservation measures, it sparked a debate and led the United States to propose and the Commission for the Conservation of Antarctic Marine Living Resources to adopt a conservation measure requiring that members provide advance notification before authorizing any new fisheries in the convention area. In 1993 the United States proposed and the Commission adopted a conservation measure specifying procedures to guide development of exploratory fisheries.

In 1993 the Commission also adopted two conservation measures to guide development of the possible crab fishery in the Antarctic. Conservation Measure 74/XII specified that the exploratory crab fishery in statistical sub-area 48.3 shall be limited to one vessel per member nation and that the total catch shall not exceed 1,600 mt during the 1993-1994 fishing season. Conservation Measure 75/XII specified a three-phase experimental fishing regime to which every vessel participating in the exploratory crab fishery in sub-area 48.3 must comply. Among other things, it specified that during the first season a vessel participates in the experimental fishery, the first 200,000 pot-hours must be within 12 blocks (with east-west dimensions equal to one-half degree of latitude, and north-south dimensions equal to one degree of longitude) and that no more than 30,000 pot-hours of effort may occur in any single block. In phase two, vessels are required to fish in three small squares measuring approximately 26 square miles and must fish continuously (except in emergencies or foul weather) within a single square until the average catch per pot has been reduced to 25 percent or less of the initial catch

level and then continue fishing for an additional 7,500 pot-hours.

In 1994 there were no notifications of new or exploratory fisheries planned to be carried out in the convention area in 1994-1995. The United States provided notification that one of its nationals planned to continue exploratory fishing for crabs in sub-area 48.3 in accordance with Conservation Measure 75/XII described above.

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 long-term or irreversible changes in the structure and dynamics of the Antarctic marine ecosystem, as well as to prevent over-fishing 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 multinational research program to assess and monitor the status of key components of the Antarctic marine ecosystem. It would be prohibitively costly to try to assess and monitor every species and population stock that might be affected directly or indirectly by fishing and associated activities in the convention area. The working group therefore developed and recommended adoption of a long-term monitoring program focused on selected indicator species. The recommended program had three major components: (1) monitoring of representative land-breeding krill predators (*e.g.*, Antarctic fur seals and Adelie and chinstrap penguins) at a network of sites throughout the Antarctic; (2) comprehensive studies of krill, krill predators, and environmental variables in three integrated study areas (Prydz Bay, the Bransfield Strait, and the area around South Georgia Island); and (3) directed studies of crabeater seals, one of the principal consumers of Antarctic krill, in one or more pack-ice areas. The working group also developed and has periodically updated a manual setting forth standard methods for collecting, reporting, and analyzing various types of monitoring data.

There has necessarily been some overlap in the interests and responsibilities of the Working Group on Ecosystem Monitoring and the Working Group on Krill. In 1993 and 1994 parts of the intersessional meetings of these two working groups were held concurrently to consider issues of joint interest. At the latter meeting, participants proposed that the two working groups be combined and drafted proposed terms of reference for the combined group.

The Marine Mammal Commission was concerned that the proposed terms of reference for the combined working group would result in less attention being given to the possible effects of the krill fishery and other fisheries on non-target species and the Antarctic marine ecosystem as a whole. Therefore, the Commission worked with the National Marine Fisheries Service, the Department of State, the National Science Foundation, and interested non-governmental organizations to develop a proposal for refining the proposed terms of reference for the combined working group. The proposal, circulated at the 1994 meeting of the Scientific Committee, resulted in the terms of reference for the new working group being refined to more clearly reflect the ecosystem perspective of the Convention.

The first meeting of this new Working Group on Ecosystem Monitoring and Management is to be held in Siena, Italy, from 24 July to 3 August 1995. The Marine Mammal Commission will work with the National Marine Fisheries Service, the National Science Foundation, the Department of State and interested non-governmental organizations to prepare for this meeting.

U.S. Antarctic Marine Living Resources Research Program

The Antarctic Marine Living Resources Convention Act of 1984 provides 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 to support 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. The Secretary of Commerce has delegated authority to the National Marine Fisheries Service.

Responsibility for developing and implementing the Service's directed research program was assigned initially to the Service's laboratory in Narrangansett, Rhode Island. In 1988 program responsibility was transferred to the Service's Southwest Fisheries Science Center in La Jolla, California. As noted in the Marine Mammal Commission's previous annual reports, the program has had two principal elements: (1) ship-supported studies of krill and related oceanographic conditions in the waters near Elephant Island (part of the Bransfield Strait integrated study area noted earlier); and (2) land-based studies of penguins and seals on Seal Island (a small island off the northwest coast of Elephant Island) that might be affected indirectly by krill harvesting in the Elephant Island area. The at-sea studies have been done by, or under the supervision of, scientists from the Southwest Fisheries Science Center. The land-based studies at Seal Island have been done by, or under the supervision of, scientists from the Service's National Marine Mammal Laboratory in Seattle, Washington.

In 1994 a decision was made by the directors of the Service's Southwest and Alaska Fisheries Science Centers to transfer responsibility for the Seal Island studies to the Southwest Center, beginning in the 1995/1996 field season. The intent of the transfer is to consolidate planning and provide more flexibility for allocating available funding among the various program elements. The transfer of program responsibilities means that, at least for the foreseeable future, scientists from the National Marine Mammal Laboratory no longer will be involved in the Service's Antarctic research program. It also means that scientists from the National Marine Mammal Laboratory may no longer be involved directly in the work of the Scientific Committee for Conservation of Antarctic Marine Living Resources.

The individual who had been responsible for designing and carrying out the land-based studies on Seal Island played a central role in developing and implementing the Ecosystem Monitoring Program described earlier. In 1988 he was elected convener of the Working Group on Ecosystem Monitoring, and served in that position until the working group was combined in 1994 with the Working Group on Krill. Depending upon the individual or individuals given responsibility to continue the land-based predator studies on Seal Island, the decision to transfer responsibility for the studies to the Southwest Fisheries Science Center could have temporary or long-term effects on future U.S. influence on the work of the Scientific Committee for the Conservation of Antarctic Marine Living Resources and its new Working Group on Ecosystem Monitoring and Management as well as the research program itself. Also, an assessment of the Seal Island study site done during the 1993/1994 austral summer indicated that the support camp was located in an area where heavy rains and earthquakes could lead to landslides and tidal waves that could destroy the camp. Seal Island is a small rocky island and there are no other safer sites on the island where the camp could be moved. Therefore, the geologists who conducted the safety study recommended that it be moved to another island.

The need to move the land-based research program to another site as well as the decision to transfer responsibility for the research to the Southwest Fisheries Science Center could affect U.S. efforts to implement the Convention for the Conservation of Antarctic Marine Living Resources. Also, the National Oceanic and Atmospheric Administration ship that has been used for the at-sea studies is being retired, and it is not clear whether the agency will use another of its ships, acquire a replacement ship, or charter a vessel to continue the at-sea work. Likewise, it is not clear whether everything feasible is being done to integrate planning of the basic research program supported by the National Science Foundation and the directed research program conducted by the National Marine Fisheries Service. Further, it is not clear whether the results of the National Science Foundation's basic research program are being made available as quickly as possible to government representatives involved in the work of the Scientific Committee and Commission for the Conservation of Antarctic Marine Living Resources. In addition, it is not clear whether the expertise of academic scientists supported by the National Science Foundation has been used to the maximum extent possible to facilitate implementation of the Convention for the Conservation of Antarctic Marine Living Resources.

On 14 November 1994 the Department of State, in consultation with the Commission, the National Marine Fisheries Service, and the National Science Foundation, held a meeting to review these and related matters bearing upon U.S. efforts to facilitate effective implementation of the Convention. Meeting participants included representatives of the Department of State, the Marine Mammal Commission, the National Marine Fisheries Service, the National Oceanic and Atmospheric Administration, the National Science Foundation, the National Research Council's Polar Research Board, non-governmental organizations, and scientists from several U.S. universities conducting marine resource-related research in the Southern Ocean.

The participants noted that the National Marine Fisheries Service's directed research program had been well-conceived but, because of limited funding, had never been fully implemented. They also noted that the program had provided the first unequivocal evidence documenting the overexploitation of finfish stocks in the South Georgia area and had led the way in designing and initiating long-term research programs necessary to determine the levels of krill harvest that can be sustained without adversely affecting krill stocks or stocks of krill-eating whales, seals, and birds dependent upon them. They further noted that, given the apparent safety hazards at Seal Island, consideration should be given immediately to transferring the land-based component of the Service's research program to a safer site and that site selection should take into account the results of oceanographic modeling and other related studies being carried out by academic researchers supported by the National Science Foundation. On a related point, participants noted that more could be done to involve scientists from U.S. academic institutions in both the National Marine Fisheries Service's directed research program and the work of the Scientific Committee for the Conservation of Antarctic Marine Living Resources.

There was insufficient time to fully consider and identify ways to resolve all the related issues. The participants therefore recommended that a meeting of government and academic scientists familiar with the Bransfield Strait area be held to identify and evaluate possible alternative sites for the land-based predator studies, and that steps be taken to improve cooperative planning of the National Marine Fisheries Service's directed research program and the National Science Foundation's basic research program, and to involve scientists supported by the National Science Foundation in the work of the Scientific Committee for the Conservation of Antarctic Marine Living Resources, and its subsidiary bodies.

No action was taken on these recommendations by the end of 1994.

The Antarctic Pack-Ice Seals Program

As noted above, the ecosystem monitoring program developed by the Scientific Committee for the Conservation of Antarctic Marine Living Resources has three major components: (1) monitoring of representative land-breeding krill predators at a network of sites throughout the Antarctic; (2) comprehensive studies of krill, krill predators, and environmental variables in three integrated study areas; and (3) directed studies of crabeater seals in one or more pack-ice areas. Until 1992 nothing was done to initiate directed studies of crabeater seals, one of the principal consumers of Antarctic krill. In 1992 the Scientific Committee on Antarctic Research's Group of Specialists on Seals outlined the basic components of an international research program necessary to assess the ecological importance of crabeater seals and other pack-ice seals in the Antarctic marine ecosystem.

In 1993 the Scientific Committee on Antarctic Research, the Scientific Committee for the Conservation of Antarctic Marine Living Resources, and the U.S. National Science Foundation provided funds for a workshop to develop a program prospective. At its meeting in May 1994 the SCAR Group of Specialists developed a five-year plan for implementing the pack-ice seal program.

If implemented as proposed, the program would resolve many uncertainties concerning the role of seals in the Antarctic marine ecosystem and whether long-term, directed studies of crabeater seals would help to detect the possible ecological effects of the krill fishery and other human activities in Antarctica. In 1995 the Marine Mammal Commission will consult with the National Science Foundation, the National Marine Fisheries Service, and the Department of State

to determine what can be done to initiate the proposed program as soon as possible.

Protection of the Arctic Environment

Polar regions of both the Arctic and the Antarctic play an important role in global climate and weather patterns. In turn, high-latitude ecosystems, although distant from major human population centers, may be affected by human activities. For example, studies indicate that a variety of pollutants that originate from human activities in the middle latitudes are being transported to and are contaminating both the Arctic and the Antarctic. Pollutants include organic compounds, heavy metals, acidifying gases, and radionuclides. The release of pollutants into these regions may affect the health of polar ecosystems and the organisms that inhabit the regions.

One such example of pollution with potentially powerful implications for Arctic ecosystems and human health is the dumping of radioactive material by the former Soviet Union. In 1993 a Russian Federation commission released a report that described the amount and locations of radioactive materials dumped in Arctic waters and seas adjacent to Russia by the former Soviet Union. Russian nuclear reactor accidents and atmospheric and subsurface nuclear weapons testing which produced atmospheric radioactive fallout over much of the Arctic in the recent past were known to the international community. However, the direct disposal of radioactive materials (*e.g.*, waste, spent fuel rods, and lost or discarded weapons) into marine ecosystems and the amounts dumped intentionally were not known until the report emerged.

Arctic Environmental Protection Strategy

Recognizing that protection of the Arctic environment will require international cooperation, the eight Arctic countries — Canada, Denmark (for Greenland), Finland, Iceland, Norway, the Russian Federation, Sweden, and the United States — adopted the Arctic Environmental Protection Strategy in June 1991 in Rovaniemi, Finland. The goals of the strategy are to preserve the environmental quality and natural resources of the Arctic, monitor environmental conditions and reduce pollution in the Arctic, and accommodate the traditional and cultural needs, values, and practices of indigenous peoples, insofar as these relate to the environment and natural resources of the Arctic.

The Arctic Environmental Protection Strategy contains no legally binding obligations. However, the eight signatory nations have committed themselves to taking all practicable steps to implement it.

The strategy calls for cooperation in five areas: environmental monitoring and assessment; conservation of flora and fauna; emergency prevention, preparedness, and response; the marine environment; and sustainable development and utilization. Working groups have been established to develop and oversee implementation of action plans for four of the program areas. A task force has been created to oversee activities related to sustainable development and utilization.

The Department of State has lead responsibility for developing and overseeing implementation of U.S. policy regarding various aspects of the protection strategy. Other agencies have lead responsibility for particular areas of cooperation: the National Science Foundation and the National Oceanic and Atmospheric Administration share lead responsibility for developing and coordinating U.S. activities regarding the Arctic Monitoring and Assessment Program; the Fish and Wildlife Service has lead responsibility for coordinating U.S. activities concerning the Conservation of Arctic Flora and Fauna Program; the Coast Guard has lead responsibility for developing and implementing U.S. activities regarding the Emergency Prevention, Preparedness, and Response Program; and the National Oceanic and Atmospheric Administration has lead responsibility for U.S. activities within the Protection of the Arctic Marine Environment Program. Activities in the United States are coordinated through an interagency working group chaired by the Department of State. This group includes representatives of the Marine Mammal Commission, the Arctic Research Commission, the Environmental Protection Agency, the U.S. Geological Survey, the Department of Defense, the National Park Service, and the previously mentioned agencies.

Protection Strategy Ministerial Meetings — The first ministerial-level meeting for the Arctic Environmental Protection Strategy took place in June 1991 in Rovaniemi, Finland. A second ministerial-level meeting was held in Nuuk, Greenland, on 16 September 1993. At this meeting the parties reviewed progress made in the previous two years and formally reaffirmed their commitment to protect and preserve the Arctic environment, continue monitoring threats to the Arctic environment, and ensure that resources are made available to enable each country to implement national pollution monitoring plans. Among other things, they issued a declaration reaffirming the Arctic Environmental Protection Strategy process, reviewed the status of the Arctic Monitoring and Assessment Program, and endorsed the direction and thrust of the Conservation of Arctic Flora and Fauna Program. Parties also agreed to form a task force on sustainable development, including sustainable utilization of resources by indigenous peoples. The ministers will meet again in April 1996 in Iqaluit, Northwest Territories, Canada.

Arctic Monitoring and Assessment Program — In 1992 through 1994 the Marine Mammal Commission worked with other agencies on developing and implementing two of the strategy's programs — the Arctic Monitoring and Assessment Program and the Conservation of Arctic Flora and Fauna Program. The objectives of the Monitoring and Assessment Program are to measure levels of anthropogenic pollutants and assess their effects on the Arctic environment and human health. Pollutants and effects of greatest concern are persistent organic contaminants, heavy metals, radionuclides, acidification, eutrophication, climate change, and increased ultraviolet radiation. Organics, radionuclides, and heavy metals receive the greatest emphasis.

Member countries supply data through national studies in fields endorsed by member countries' environmental ministers. The data, which are housed and cataloged in Oslo, Norway, are organized according to ecosystem components (*e.g.*, terrestrial, marine, and freshwater environments) and observational tools (*e.g.*, remote sensing). Data from the various studies will provide the foundation for assessing the effects of pollution on Arctic ecosystems.

The working group has thus far amassed a 500-item directory of environmental projects, and it has begun work on a comprehensive assessment report on Arctic pollutants. The 13-chapter assessment report is being prepared by working group members and contracted experts. The United States and Russia are responsible for the chapter on the effects of heavy metals. The United States may also be called upon to contribute to the report's fresh water and global environmental processes chapter. A working draft of the report is expected to be completed by March 1995 and the final report is scheduled for publication early in 1997.

The program is not centrally funded and relies on contributions from member nations. Contributing agencies from the United States include the Department of State, the National Science Foundation, and the Office of Naval Research.

[Further information on the activities of this working group can be obtained from the Executive Secretary, Arctic Monitoring and Assessment Programme, Strømsveien 96, P.O. Box 8100, Dep. N-0032, Oslo, Norway.]

Conservation of Arctic Flora and Fauna — This program was established to address activities possibly affecting Arctic species and their habitats. Its main goals are to conserve Arctic flora and fauna, their diversity and their habitats; protect Arctic ecosystems from degradation; improve conservation management, laws, regulations, and practices for the Arctic; and integrate Arctic interests into international conservation fora. The group addresses these goals by assembling information on the status of and threats to Arctic vegetation and wildlife and identifying and developing priorities for cooperative international action to address the most serious threats. As part of this process, the program's working group seeks to use traditional knowledge of Arctic indigenous people.

The Conservation of Arctic Flora and Fauna Working Group operates through a system of designated agencies and national contacts responsible for their respective nations' participation in the program. The United States is represented by the Fish and Wildlife Service. The working group, which includes a member of the Marine Mammal Commission's

Committee of Scientific Advisors, meets at least annually to assess progress and to develop work plans. The first meeting of the working group was in April 1992 in Ottawa, Canada. Since then the group has met in May 1993 in Fairbanks, Alaska, and in September 1994 in Reykjavik, Iceland. The working group will meet again in Moscow in 1995 to review progress and update its work plans.

At the Fairbanks meeting, the group developed its 1993/1994 work plan. The goals of the work plan are to establish a network of Arctic Protected Areas, develop an environmental and ecological mapping project based on Arctic Natives' traditional knowledge, form a circumarctic seabird group to promote seabird management and conservation, and develop a list of rare plants in the northern treeless region for use in identifying ecosystems in need of conservation. The group recommended that a list of faunal species that are endangered or of particular economic or ecological importance be compiled; that coordinated conservation efforts be developed for those species; and that a list of indicator species be prepared for use in assessing and monitoring environmental impacts and changes.

At the September 1994 meeting in Reykjavik, the working group changed the focus of its work plan to emphasize four key areas. They are habitat conservation, species conservation, Arctic regional implementation of the Convention on Biological Diversity, and integration of indigenous people's traditional knowledge into policy formulation. This was done to concentrate on key issues first. In 1994 the group also published a report entitled "The State of Protected Areas in the Circumpolar Arctic 1994," which provides, among other things, a directory of protected areas in the Arctic. It also provides information on the various types of habitat classification used by the Arctic countries and an overview of the protected area system in each country, including a description of the types of activity occurring within the protected areas.

In addition, the working group has developed lists of Arctic species that require special conservation efforts, *i.e.*, (1) species that are rare, vulnerable, or endangered; (2) indicator species, or those that might provide indications of broad-scale change in Arctic ecosystems; and (3) species not on the previous two lists that are of special economic or ecological concern. The list of rare, vulnerable, and endangered animals includes 36 species, 12 of which are marine mammal species or subspecies. The working group also formed a circumpolar seabird specialist group to facilitate exchange of information among experts and researchers. This group has developed a draft murre conservation strategy.

The Marine Mammal Commission provides advice to the Fish and Wildlife Service regarding activities of the Conservation of Arctic Flora and Fauna Working Group related to marine mammals. At the Commission's 1994 annual meeting, the Commission and its Committee of Scientific Advisors were briefed on the Fish and Wildlife Service's activities with respect to the working group. The Commission wrote to the Service on 15 December 1994 indicating that the working group clearly is dealing with a broad range of issues concerning marine mammals, marine mammal habitats, and human uses of marine mammals in Alaska and adjacent areas. In light of this, the Commission suggested that expanded and earlier consultation with the Marine Mammal Commission on such matters would probably be much to the Service's benefit, particularly when the Commission and the Service have different perspectives on an issue.

[Information on the activities of the Conservation of Arctic Flora and Fauna Working Group can be obtained from the International Secretariat, Conservation of Arctic Flora and Fauna, c/o Canadian Wildlife Service, Ottawa, Canada K1A 0H3.]

Protection of the Arctic Marine Environment — This group examines the effects of a range of sources and contaminants including offshore oil and gas development, ocean dumping of radioactive wastes, and land-based sources of pollution. It evaluates national and international legislation to determine how these laws can be strengthened to further protect the Arctic marine environment. The inaugural meeting of the Protection of the Arctic Marine Environment Working Group was in May 1994 in Oslo, Norway. At this meeting the group produced a work plan and an outline of the proposed 1996 report to ministers. The working group adopted a risk-based approach to identifying pollution sources, determining environmental impacts, and recommending action. The group

also decided that its principal focus will be on chronic, not acute pollution (*e.g.*, routine discharges rather than accidental spills). Within the group, the United States accepted lead responsibility for work on ocean dumping, including radioactive waste, and will provide the working group with a summary of national legislation dealing with marine pollution.

Emergency Prevention, Preparedness and Response — The Working Group on Emergency Prevention, Preparedness and Response addresses the problem of disasters not created by nature. The group has focused recently on risk assessments dealing with nuclear disasters and rapid response to oil spills. It is establishing a risk assessment matrix that profiles, for specific sites within each country, the potential threats and impacts of catastrophic accidents and identifies gaps in coverage. For each site, countries rank the probability of an emergency and the probable magnitude of an accident. Its most recent meeting in June 1994 in Anchorage was held in conjunction with a "table-top exercise" of a nuclear accident to examine the process for alerting and communicating with neighboring countries and the international community. The exercise demonstrated both the potentially devastating effect of a radiological emergency on indigenous people and the need for prompt international cooperation.

Sustainable Development — The sustainable development task force held its first meeting in Yellowknife, Northwest Territories, Canada, in September 1994. The group prepared a work plan to address various issues of utilization, trade, management, and other aspects of development of living resources in the Arctic. These include a study of the 1973 polar bear convention and a historical study the development of the Prudhoe Bay oil fields from a sustainable development perspective.

Ecological Knowledge of Indigenous People — Indigenous people have much knowledge of Arctic ecosystems and their component elements, derived through hundreds of years of living in the Arctic. Utilizing this knowledge is a cornerstone of each of the programs of the Arctic protection strategy. While there is clear interest in providing a role for indigenous people in the formulation of policies and programs affecting them, their environment, and their culture, often there are no funds for representatives of indigenous people to travel to, participate in, and follow up on national and international meetings. To address this problem, the Commission, in cooperation with the Department of State, provided funds in 1994 to allow representatives of the Alaska Native community to attend international meetings, the outcomes of which could affect their welfare. As described in Chapter XI, this was done through three contracts with the Inuit Circumpolar Conference. Among other things, these contracts provided funds for designated representatives of Alaska Native groups to prepare for and attend (1) meetings to conclude and implement a bilateral agreement on the conservation and management of polar bear populations and their habitats in areas under Russian and U.S. jurisdiction, (2) an international seminar on traditional knowledge of indigenous people and meeting of the Conservation of Arctic Flora and Fauna Working Group, and (3) meetings related to the Arctic Environmental Protection Strategy. Several meetings took place in 1994 and others will occur in 1995 and 1996. This participation has enabled Alaska Natives to take an active part in the deliberations and activities of the Arctic Monitoring and Assessment Program, Conservation of Arctic Flora and Fauna Working Group, and other international fora.

Related Arctic Environment Issues

New U.S. Arctic Policy — The Administration began work on a revised Arctic policy statement in 1993. Various agencies involved in Arctic environmental issues, including the Marine Mammal Commission, provided input.

The policy statement was released on 26 September 1994. It is based on six principles: (1) protecting the Arctic environment and conserving its biological resources; (2) assuring that natural resource management and economic development in the region are environmentally sustainable; (3) strengthening institutions for cooperation among the eight Arctic nations; (4) involving the Arctic's indigenous people in decisions that affect them; (5) enhancing scientific monitoring and research on local, regional, and global environmental issues; and (6) meeting post-Cold War national security and defense needs.

To implement the policy, the Administration plans to (1) expand cooperation under the Arctic Environmental Protection Strategy and other international fora to improve protection of the environment while providing for environmentally sustainable development; (2) further scientific research through development of an integrated Arctic research budget that supports national and international scientific research; (3) improve efforts to conserve Arctic flora and fauna, with particular attention to polar bears, walruses, seals, caribou, migratory birds, and boreal forests; (4) strengthen international cooperation for preparing for and responding to environmental disasters; (5) support participation by Alaska's indigenous people in Arctic policy deliberations affecting their environment, culture, and quality of life; and (6) improve overall international cooperation, especially with the Russian Federation.

U.S.-Russian Agreement on Contaminants in the Arctic — On 16 December 1994 the United States entered into an agreement with the Russian Federation to cooperate in the prevention, reduction, and control of pollution in Arctic marine and terrestrial environments resulting from the accidental or intentional release of contaminants. The provisions of the agreement include bilateral cooperation in the conduct of scientific research, monitoring, and assessment activities to determine the potential impacts of anthropogenic contaminants and the effects of such contaminants on Arctic flora, fauna, and human health. Cooperation is also mandated for conducting joint scientific research to predict ecological impacts of and providing technical solutions for removal of radioactive waste. In addition, the agreement will promote programs for the exchange of scientists, students, and experts; the development of geographic information systems, databases, and inventories on Arctic environmental data; and cooperation in emergency preparedness exercises and the prompt exchange of information about major accidental releases of contaminants.

In 1995 the Commission will continue its involvement in issues addressed by the Arctic Environmental Protection Strategy and other international programs and activities affecting marine mammals and their habitats in the Arctic, and the Alaska Natives who depend upon them.

Agreements Related to Polar Bears

Polar bears occur throughout the Arctic in six relatively discrete populations. Population ranges overlap national boundaries. Thus, effective conservation of polar bears requires cooperative actions by the range states. During 1994 substantial progress was made in this area. These events and past activities leading up to them are discussed below.

Agreement on the Conservation of Polar Bears

Increased hunting of polar bears in the 1950s and 1960s and concerns about the effects of industrial activities on polar bears and their habitat led to an international dialogue on the need to conserve polar bears throughout the Arctic. In 1973 the Governments of Canada, Denmark (for Greenland), Norway, the Soviet Union, and the United States concluded the Agreement on the Conservation of Polar Bears. Article I of the Agreement prohibits the taking of polar bears, subject to certain exceptions. Article II requires that each contracting Party "take appropriate action to protect the ecosystems of which polar bears are a part, with special attention to habitat components such as denning and feeding sites and migration patterns...." When the Agreement was concluded, the Parties also adopted a resolution banning the hunting of polar bear cubs, female bears with cubs, and bears moving into denning areas or in dens.

As noted above, the Polar Bear Agreement requires that contracting parties focus special attention on protecting components of polar bear habitat, such as denning and feeding sites and migration routes. Steps taken by the Fish and Wildlife Service to meet this requirement are described in Chapter IV under the discussion of polar bears and in Chapter X under the discussion of small-take exemptions. These steps include the preparation of a polar bear habitat conservation strategy, expected to be completed by May 1995.

The Marine Mammal Commission and others have questioned whether the Marine Mammal Protection Act and/or other domestic statutes provide sufficient legal authority for the United States to fully implement the Agreement, particularly as it relates to

habitat protection. In 1992 the Commission contracted for a comprehensive legal assessment of (1) whether the Marine Mammal Protection Act and other domestic statutes provide adequate authority for the United States to fully implement the provisions of the Agreement; (2) whether the United States has failed or is failing to meet any of its obligations under the Agreement and, if so, in what ways; (3) whether additional statutory authority, regulations, or other measures may be necessary to enable the United States to fully meet its obligations; and (4) whether the United States should consider proposing any changes in the Agreement or the Marine Mammal Protection Act to provide for more effective conservation of polar bears and their habitat throughout the Arctic.

The contractor's report, *Reconciling the Legal Mechanisms To Protect and Manage Polar Bears under United States Law and the Agreement for the Conservation of Polar Bears*, was provided to the Commission on 20 December 1993. It noted that, while the goals and provisions of the Marine Mammal Protection Act and the Polar Bear Agreement are similar, there are some inconsistencies. For example, the Polar Bear Agreement prohibits, but the Marine Mammal Protection Act does not prohibit, the use of aircraft and large motorized vessels to hunt polar bears, and the taking of polar bears from the wild for purposes of public display. Also, the Marine Mammal Protection Act authorizes the take of polar bears incidental to industrial activities if certain conditions are met, whereas the Polar Bear Agreement does not. Further, the Polar Bear Agreement obligates the Parties to protect denning areas, feeding areas, and other areas of similar importance to polar bears, but neither the Marine Mammal Protection Act nor other domestic statutes provide explicit authority for doing so. The report identified and described the pros and cons of actions that could be taken to revise both the Marine Mammal Protection Act and the Polar Bear Agreement to eliminate inconsistencies.

On 12 January 1994 the Commission forwarded the report to the Fish and Wildlife Service. In the accompanying letter, the Commission noted that the Service was involved in a number of issues that were discussed in the legal analysis. These issues included reauthorization of the Marine Mammal Protection Act, the development of a polar bear conservation plan, the preparation of a polar bear habitat conservation strategy, and the possible development of an agreement with the Russian Federation for cooperative management of the Chukotka-Alaska polar bear population (discussed below). The Commission recommended that the Service carefully consider the report in the process of developing its views on each of the issues.

As discussed elsewhere in this report, in April 1994 Congress adopted extensive amendments to the Marine Mammal Protection Act. In response to concerns that the Agreement on the Conservation of Polar Bears may not have been fully implemented by the United States and other parties, Congress amended section 113 to require the Secretary of the Interior to initiate two reviews. Section 113(b) requires the Secretary, in consultation with the contracting parties, to review the effectiveness of the Agreement. The review is to be initiated by the end of April 1995. Also, the Secretary is to work with the contracting parties to establish a process by which future reviews of the Agreement will be conducted.

With regard to domestic implementation of the Polar Bear Agreement, the amendments require the Secretary of the Interior, in consultation with the Secretary of State and the Marine Mammal Commission, to review the effectiveness of U.S. implementation, particularly with respect to the habitat protection mandates of the agreement. A report on the results of that review is to be submitted to Congress by 1 April 1995. In addition, the amendments call on the Secretary, acting through the Secretary of State and in consultation with the Marine Mammal Commission and the State of Alaska, to consult with appropriate officials in the Russian Federation to develop and implement enhanced cooperative research and management programs for conserving polar bears in Alaska and Russia. A report on the consultations and periodic progress reports on research and management actions taken under this provision are to be provided to Congress.

On 18 July 1994 the Commission wrote to the Fish and Wildlife Service with regard to both the legal analysis that had been provided on 12 January and the new requirements under the 1994 Marine Mammal Protection Act amendments. In its letter, the Com-

mission recommended that, as a first step toward meeting the requirements of the amendments, the Service convene a meeting of representatives of interested governmental and non-governmental entities to review and agree on points put forth in the legal analysis.

With regard to full implementation of the Agreement by the United States, the Commission noted that the three aspects of most concern are (1) the habitat protection mandate, (2) the prohibition on the use of aircraft and large motorized vessels for taking polar bears, and (3) the resolution calling for a ban on hunting of cubs and females with cubs and a ban on hunting in occupied denning areas.

In its letter, the Commission also commented on the requirement that the Secretary consult with appropriate officials in the Russian Federation to develop cooperative research and management programs for conserving polar bears in Alaska and Russia. One of the three Commissioners to the Marine Mammal Commission is a resident of the State of Alaska and a recognized authority on polar bears. In its 18 July letter, the Commission recommended that, to facilitate the Service's required consultations with the Commission on these issues, the Service keep the above-mentioned Commissioner fully apprised in a timely fashion of all matters relating to the review of the Polar Bear Agreement, the review of U.S. implementation of the agreement, and preparation of negotiating positions regarding the proposed polar bear research and management agreement with Russia (see below). Further, the Commission recommended that the Commissioner be included as a member of the United States delegation negotiating the cooperative agreement with Russia.

On 31 August 1994 the Service responded to the Commission's 18 July letter. In its response, the Service noted that it endorsed the Commission's recommendation to convene a meeting of interested groups to review U.S. implementation of the 1973 Polar Bear Agreement and to use the legal analysis prepared for the Commission as a basis for the review. It stated that the Service's Alaska Region would arrange the review in the near future and would consult with the Commission and the Department of State regarding the review.

With respect to the requirement that the Secretary of the Interior begin consultations with the Russian Federation to develop and implement cooperative research and management programs for conserving polar bears in Alaska and Russia, the Service noted that it had previously begun such discussions and was continuing dialogue with Russian counterparts. The Service further noted that it fully intended to keep the Commission apprised of activities related to the review and preparation of draft documents. It also noted it had invited the Commissioner to join the U.S. working group formulated to develop draft documents and that a meeting was scheduled for 6-9 September 1994 in Nome, Alaska, with representatives of the Russian Federation.

Bilateral Polar Bear Agreements

As discussed in Chapter IV, two discrete polar bear populations occur in Alaska, and both are shared with other countries. The northern (Beaufort Sea) population is shared with Canada and the western (Bering-Chukchi Seas) population is shared with Russia. Efforts to develop cooperative programs with these countries for the management and conservation of polar bears are discussed below.

Alaska/Inuvialuit Polar Bear Agreement — As noted earlier, prior to passage of the Marine Mammal Protection Act in 1972, both sport and subsistence hunting of polar bears in Alaska was managed by the State. The Act transferred management authority to the Fish and Wildlife Service, and exempted coastal Alaska Natives from its moratorium on taking provided the taking is non-wasteful and for subsistence or for making traditional handicrafts or clothing.

The Beaufort Sea polar bear population is hunted by Natives from northwestern Canada as well as Alaska. If not regulated effectively, such hunting, by itself and in combination with other activities, could cause the population to decline below its optimum sustainable population level. Recognizing this, the Fish and Game Management Committee of Alaska's North Slope Borough and the Inuvialuit Game Council of Canada's Northwest Territories entered into an agreement in January 1988 to govern cooperatively the hunting of polar bears in the area between Icy Cape, Alaska, and the Baillie Islands, Canada.

Among other things, the agreement calls for protection of cubs, females with cubs, and all bears inhabiting or constructing dens. It also prohibits hunting at certain times of the year and provides that a harvest quota, based upon the best available scientific evidence, be established annually. Quotas are to be allocated equitably between Natives in Alaska and Canada, and data are to be collected and shared on the number, location, age, and sex of bears killed. The agreement has no legal status and does not provide for enforcement and penalties in Alaska. Also, it does not apply to Native subsistence hunting of polar bears in Alaska south and west of Icy Cape.

U.S.-Russian Polar Bear Agreement — As noted earlier, a relatively discrete polar bear population, the western or Bering-Chukchi Seas population, occurs partially in Alaska and has traditionally been used by Native peoples of both Alaska and Chukotka, Russia. In its 28 June 1992 letter forwarding the draft polar bear conservation plan to the Fish and Wildlife Service, the Commission identified the possible need for a cooperative U.S.-Russian program to manage the take of polar bears from the Bering-Chukchi Seas population. On 22 October 1992 the Fish and Wildlife Service's Alaska Regional Director signed a protocol with the Russian Ministry of Ecology and Natural Resources stating the parties' intentions to conclude an agreement on the conservation and regulated use of polar bears from the Bering-Chukchi Seas population common to the two nations.

The protocol recognized the unique role of the Bering-Chukchi Seas polar bear population in the lives of indigenous peoples of Alaska and Chukotka, in preserving and developing traditional ways of life, and in maintaining the "ecological security" of those regions. It specifies that an agreement is to be developed placing priority on cooperative efforts, such as exchanging information on the status of the Bering-Chukchi Seas polar bear population, with particular emphasis on evaluating population abundance and regulation of its use; cooperating with international and Native organizations whose activities are connected with the study and conservation of polar bears; bio-monitoring using coordinated methodologies; joint field research; coordinating polar bear conservation and management activities; and exchanging information on environmental legislation.

The protocol called on both Governments to create special working groups composed of representatives of government agencies and Native peoples to prepare proposals for such an agreement, and to convene a meeting of the working groups in Russia to prepare a draft agreement.

During informal discussions among the Fish and Wildlife Service and Alaska Native groups relative to development of the Service's draft conservation plan for polar bears, consideration was given to forming an Alaska polar bear commission similar to the Alaska Eskimo Walrus Commission and the Alaska Sea Otter Commission. This idea, one which has been supported by the Marine Mammal Commission, was subsequently considered and positively received at a meeting between Native hunters and Service representatives on 22 June 1993.

On 18 August 1993 the Service wrote to a representative of the Alaska Native hunters, following up on the 22 June meeting. In that letter, the Service noted that the proposal to form a polar bear hunter organization was timely, considering Russia's intent to allow resumption of hunting in the Chukotka region. The Service also forwarded a copy of a draft agreement on the management of the Chukotka-Alaska polar bear population that had been submitted by the Russian Federation Ministry of Ecology and Natural Resources. The Service further advised that a meeting was scheduled for the week of 25-29 October 1993 in Russia to consider the draft, and invited a representative of the Native polar bear hunters to attend the meeting in order to report back on its outcome to Native polar bear hunters.

On 20 September the Alaska Eskimo Walrus Commission wrote to the Marine Mammal Commission concerning the planned U.S.-Russian meeting on polar bears. In the letter, the Eskimo Walrus Commission noted that formation of a polar bear commission had been delayed to allow additional time to explore various organization structures under which the new commission could be organized. The Walrus Commission suggested that the role of Alaska Natives in the U.S.-Russian meeting should be broader than mere observer status, as apparently envisioned by the Fish and Wildlife Service. The group advised the Marine Mammal Commission that it had requested

that the scheduled October meeting between the Service and the Russian Federation be postponed until the planned polar bear commission could be formed.

The Marine Mammal Commission concurred with the position of the Alaska Natives and by letters of 4 October 1993 recommended to the Departments of State and the Interior that further discussions of the U.S.-Russian polar bear agreement await the formation of an Alaska Native Polar Bear Commission and the substantive involvement of potentially affected Native communities in the negotiations.

On 9-10 November 1993 representatives of the Service's Alaska Regional Office met with representatives of the Alaska Native community to discuss the proposed conservation agreement with Russia. At that meeting, it was recognized that formation of an Alaska Native polar bear commission was needed to effectively represent the interests of Alaska Natives in matters affecting the conservation of polar bears. It was agreed that in order to stimulate Russian Native interest in the process of negotiating a polar bear conservation agreement, it would be useful to hold a meeting involving Natives of both countries prior to the first meeting of U.S. and Russian delegations, as called for in the protocol.

On 29 March 1994 the president of the Inuit Circumpolar Conference wrote the Department of State seeking financial support for, among other things, participating in negotiation of a polar bear agreement with Russia. In the letter, the director emphasized the importance of involving the regional Russian government of Chukotka and the Native people of the region in the development of any agreements aimed at ensuring the protection of polar bear habitat and the sustainable harvest of the species.

Because of the Marine Mammal Commission's expertise in this area, it was agreed that the Department of State would transfer the necessary funds to the Commission, which in turn would make the monies available to the Natives. Thus, on 28 July 1994 the Commission and the State Department's Bureau of Oceans and International Environmental and Scientific Affairs signed a Memorandum of Agreement by which the Department of State provided the Commission with funds to support Native involvement in negotiating meetings. Similar funding arrangements were agreed to support Alaska Native participation in a 1994 Seminar on Indigenous Knowledge and Conservation of Arctic Flora and Fauna Working Group and meetings of the Arctic Environmental Protection Strategy (see Chapter XI for further discussion).

On 25 April 1994 Native groups representing the Chukotka province of Russia and Alaska signed a protocol of intention between the indigenous people of the two areas on the conservation, protection, management, and study of the Bering and Chukchi Seas shared polar bear population. It called for developing an agreement for the joint management of the population based on the following principles: (1) the text should not contradict the 1973 Agreement on Conservation of Polar Bears; (2) the protocol is to be considered as provisional to provide the basis for future development of a more detailed plan and joint agreements on the management, study, and conservation of polar bears with the participation of federal governments. The protocol also called for a meeting of working groups in 1994 to develop the agreement.

On 16-17 June 1994 the Alaska Nanuuq Commission was formed to represent polar bear hunters in 20 Alaska communities. The broad mission defined by the new Commission's bylaws is to encourage and implement self-regulation of harvest and use of polar bears.

On 28 July 1994 the Fish and Wildlife Service provided the Commission and others with a draft management agreement for polar bears shared with Russia (formally titled the Draft Agreement on the Management of the Chukotka-Alaska Polar Bear Population between the U.S. Fish and Wildlife Service and the Russian Federation Ministry of Ecology and Natural Resources) and a draft of the native-to-native implementation agreement, described as being in the early formative stages.

On 12 August 1994 the Commission wrote to the Service's Alaska Region regarding the 1994 amendments to the Act that called on the Secretary of the Interior to initiate two reviews relative to the 1973 polar bear agreement and to report back to Congress by 1 April 1995. The Commission noted that it had

recently been provided with a working draft of an agreement on the management of the Chukotka-Alaska polar bear population between the Fish and Wildlife Service and the Russian Federation Ministry of Ecology and Natural Resources.

In its letter the Commission noted that although it was pleased that the parties were attempting to develop rational plans to manage and conserve polar bears, it questioned whether the agreements apparently being envisioned fully met the objectives of the Marine Mammal Protection Act. For instance, the draft agreements focused on the allocation of polar bears to be taken by Native hunters of the two countries and paid little attention to other research and management issues. Of particular concern to the Commission was the lack of detail with respect to habitat protection, particularly significant given the recent U.S.-Russian proposal for oil and gas leasing in the Chukchi Sea and Hope Basin (discussed in Chapter X).

In the Commission's opinion, greater attention should have been focused on the 1973 polar bear agreement, the umbrella under which this more specific bilateral agreement should be negotiated. Toward this end, the U.S.-Russian agreement should include specific references to the applicable provisions of the 1973 agreement and provide greater explanation of how the bilateral agreement is intended to help give effect to the multilateral agreement. Furthermore, the Commission said, the bilateral agreement should anticipate possible changes to the 1973 agreement that might result from the review of the effectiveness of the agreement as called for in the 1994 amendments. The Commission suggested that there also may be substantial benefit from soliciting public comment prior to meeting the Russians and asked if the Service planned to do this.

On 22 August 1994 the Department of State wrote to the Fish and Wildlife Service expressing its concerns regarding the Service's draft working agreement. In its letter, the State Department noted its view that the draft tended to emphasize managed use of polar bears over conservation needs. The Department also pointed out that it was an appropriate time for the Service to initiate consultations with other relevant agencies and organizations, including the Marine Mammal Commission, the Justice Department, the State of Alaska, and environmental organizations. As a final point, the State Department stressed the importance of not exchanging any proposed agreements with the Russians until there is an agreed U.S. Government draft. Subsequently, the Fish and Wildlife Service withdrew its draft agreement.

Representatives from Native and governmental agencies from the United States and Russia met 6-9 September 1994 in Nome, Alaska, for technical discussion on the joint conservation of the shared population of polar bears occupying the Chukchi, Bering, and eastern Siberian Seas. This resulted in an agreement signed 9 September 1994 entitled "Protocol on U.S./Russia Technical Consultation for the Conservation of Polar Bears of the Chukchi/Bering Sea Regions." The protocol stated (1) that the 1973 agreement should serve as the basic framework for joint conservation agreements; (2) that both a government-to-government agreement and a native-to-native agreement should be developed; (3) that biological information, including scientific data and traditional knowledge, is fundamental, and therefore the parties will continue and expand cooperative research programs on polar bears; (4) principles of sustained yields will be institutionalized in the agreement to serve as the basis for future harvest guidelines and allocation; (5) subsistence use of polar bears, including the making and selling of articles of handicraft and clothing, is a recognized legitimate use; (6) both parties shall strive to minimize commercial use of polar bears harvested for subsistence purposes; (7) habitat protection and conservation shall be a cornerstone to a future agreement; (8) both parties recognize the need to curb illegal take and trade of polar bears and polar bear products; (9) monitoring and verification programs shall be an integral component of a future agreement; and (10) both parties resolve to seek appropriate authorizations to begin formal negotiation as soon as possible.

Convention on International Trade in Endangered Species of Wild Fauna and Flora

The Convention on International Trade in Endangered Species of Wild Fauna and Flora provides an

international framework for regulating trade in animals and plants that are or may become threatened with extinction. The Convention entered into force in 1975 and currently comprises 128 parties. During 1994 eight nations became signatories to the Convention; they are Comoros, Côte d'Ivoire, Eritrea, Mali, Romania, Saint Kitts and Nevis, Sierra Leone and Viet Nam. Within the United States, the Fish and Wildlife Service acts as the lead agency for Federal actions carried out under the Convention.

The Convention provides for three levels of trade control. Depending on the extent to which a species is endangered, it may be included on one of three appendices to the Convention. Appendix I includes those species considered to be threatened with extinction and that are or may be affected by trade. Appendix II includes species that are not necessarily threatened with extinction but could become so unless trade in them is strictly controlled. Species may also be included on Appendix II if they are so similar in appearance to a protected species that the two could be confused. 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 require concurrence by two-thirds of the Parties voting on a listing proposal. Species may be placed on Appendix III unilaterally by any Party.

Parties to the Convention meet every two years to consider, among other things, additions and deletions to the appendices. During recent meetings, the question has been raised as to whether the criteria used for listing species on the appendices should be clarified and/or made more objective. At the eighth Conference of Parties in March 1992 the CITES Parties directed the Standing Committee to undertake a revision of the criteria (commonly referred to as the Berne Criteria) used to amend the appendices. The Standing Committee in turn contracted with IUCN-The World Conservation Union to provide recommendations.

In March 1993 IUCN submitted its recommended criteria to the CITES Standing Committee. As discussed in the previous annual report, the Fish and Wildlife Service distributed the recommendations to the Commission and others for review and comment. The Commission reviewed the recommended criteria and on 25 June 1993 forwarded comments to the Service. In its letter, the Commission noted that it appeared that several highly endangered species or populations of marine mammals would not meet the proposed biological criteria for listing on Appendix I. These include the northwest Atlantic right whale population, one of the most endangered marine mammals in U.S. waters, as well as the highly endangered Florida manatee and Hawaiian monk seal.

The Commission further noted that adoption of the recommended criteria could impede efforts to protect and rebuild depleted species and populations of marine mammals and would be contrary to the intents and provisions of both the Endangered Species Act and the Convention on International Trade in Endangered Species of Wild Fauna and Flora. The Commission suggested, among other things, that the Fish and Wildlife Service ask the National Marine Fisheries Service to provide an assessment of what marine mammal species and populations would be listed on the three CITES appendices using the proposed criteria and, if the assessment indicates that adoption of the criteria would inappropriately compromise efforts to protect and rebuild depleted marine mammal stocks, suggest how the criteria might be revised to avoid such problems.

Three CITES committees (the Standing Committee, Plants Committee, and Animals Committee) met in joint session between 30 August and 3 September 1993 in Brussels, Belgium, to consider possible revision of the recommended criteria based on the comments received. The resulting draft resolution was considered at a subsequent meeting of the CITES Standing Committee. While the committee did not adopt the resolution, it did endorse a continuation of the evaluation process, and the draft resolution was forwarded to the CITES Parties. On 12 November 1993 the Fish and Wildlife Service circulated the revised draft for additional review and comment.

Based on the responses it received, on 7 January 1994 the Service wrote to the CITES Standing Committee recommending that the draft resolution be tabled and instead be provided to the Parties prior to

the biennial meeting for use as a working paper. In the United States' opinion, the draft resolution was focused almost exclusively from the narrow scope of biological extinction rather than the broader scope — more consistent with the text of the Convention — related to ecological extinction or even commercial extinction. In addition, the United States believed that the draft omitted, among other things, consideration of (1) the loss of genetic diversity, (2) measures of abundance or population status other than counts of mature individuals, and (3) the role of the species in its ecosystem.

The CITES Standing Committee met on 21-25 March 1994 in Geneva, Switzerland, to consider comments submitted by the Parties on the draft resolution. The committee did not adopt the U.S. recommendation to table the draft resolution and instead approved a revised draft that was subsequently circulated to the Parties for review.

The United States continued to be concerned that the Standing Committee's draft resolution would establish narrow and artificial quantitative thresholds for determining when a species should be included on the appendices. Therefore, on 10 June 1994 the United States submitted proposed alternative language for portions of the draft resolution having to do with biological criteria. The intent of the U.S. proposal was, among other things, to ensure sufficient flexibility in the listing procedures.

CITES nations considered the draft resolution on biological criteria at the ninth Conference of Parties, held 7-14 November 1994 in Fort Lauderdale, Florida. In order to eliminate the confusion and vagueness that were inherent in the Berne Criteria, it was agreed that the revised criteria should incorporate quantitative values, particularly in the biological criteria for Appendix I. However, the Parties recognized that such quantitative elements would be more appropriate as guidelines instead of inflexible threshold values. Therefore, the Parties agreed to include the concept of quantitative thresholds under the "Definitions, Notes and Guidelines" section of the resolution. In doing so, the Parties noted that the adopted threshold figure of 5,000 mature individuals is included only as an example and that it is impossible to give numerical values that are applicable to all taxa.

Proposed Changes to the Appendices

As noted earlier, Parties to the Convention meet every two years to consider, among other things, changes to the appendices. In preparation for the 1994 meeting, the Fish and Wildlife Service on 15 July 1993 published a *Federal Register* notice requesting information on species that should be considered for addition to or deletion from the appendices or transfer from one appendix to another. In response, on 27 September 1993 the Environmental Investigation Agency submitted a petition requesting, among other things, that protection for the narwhal (*Monodon monoceros*) be increased by transferring the species from Appendix II to Appendix I.

The narwhal is a small, toothed whale found only in the Arctic, primarily in waters off Canada and Greenland. Adult male narwhals produce a long, straight, spiralled ivory tusk that has long been prized for its alleged medicinal, therapeutic, and aphrodisiac qualities. A proposal to transfer the narwhal from Appendix II to Appendix I had been introduced at the fifth Conference of Parties in 1985 by the Federal Republic of Germany. The proposal was rejected at that time because existing data were not sufficient to indicate that the species was in a danger of extinction and because some Parties feared that its listing on Appendix I might drive the trade underground.

In its 1993 submission, the Environmental Investigation Agency argued that abundance assessments for many narwhal populations are inadequate and that international trade in narwhal ivory is placing unsustainable hunting pressures on the species.

On 22 October 1993 the Fish and Wildlife Service forwarded the proposal to the Marine Mammal Commission and others for review. The Commission responded on 16 December 1993, noting that while information provided in the proposal raises concerns regarding the current level of knowledge about the status of narwhal stocks and the hunting pressures on the species, there was insufficient information to demonstrate that any stock of narwhals is threatened with extinction and merits inclusion on Appendix I.

The Commission noted, however, that it shared a concern expressed by the International Whaling

Commission's Scientific Committee and others that harvests of some narwhal stocks may be unsustainable. As such, the Commission suggested that the United States work within the CITES framework to encourage Canada and Greenland to secure better information on the status and trends of narwhal stocks and on harvest levels, particularly with respect to animals that are struck and lost. The Commission also suggested that the United States should indicate that, while it does not currently support an Appendix I listing, it may support such a proposal in the future if the present uncertainties remain unresolved.

By means of a 27 January 1994 *Federal Register* notice, the Fish and Wildlife Service requested information on species, including the narwhal, that had been identified as candidates for consideration by CITES as its biennial meeting. The Service noted that available information regarding narwhal stocks is scarce. Accordingly, it sought information on population levels, stock structure, catches, and trade. The Service further noted that, without additional information on the threat to the species, it was unlikely to propose its transfer to Appendix I.

On 10 March 1994 the petitioner, Environmental Investigation Agency, forwarded to the Service supplementary information on narwhal stocks. The Fish and Wildlife Service subsequently concluded that available evidence did not support adding the narwhal to Appendix I, and the proposal was not carried forward.

On 15 February 1994 Norway announced plans to submit a proposal to downlist the northeast Atlantic and North Atlantic stocks of minke whales (*Balaenoptera acutorostrata*) from Appendix I to Appendix II. The proposal cited scientific assessments that showed the populations to be near their initial size, and noted that the minke stocks do not meet the criterion for Appendix I that they be "currently threatened with extinction."

On 28 April 1994 the National Marine Fisheries Service provided for review its draft comments on Norway's proposal. The draft noted that in 1979 CITES Parties passed a resolution discouraging commercial trade in any species or stock that is protected from current whaling under the International Whaling Commission (IWC). Accordingly, the United States does not consider it appropriate for CITES to withdraw support for the IWC moratorium on commercial whaling by considering at this time the revision of the CITES listings for these whale populations.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the draft comments and by letter of 10 May 1994 advised the National Marine Fisheries Service that it concurred with the proposed response.

The ninth meeting of the Conference of Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora was held 7-18 November 1994 in Fort Lauderdale, Florida. At the meeting, the Norwegian proposal to transfer the minke whale from Appendix I to Appendix II was considered. Several parties, including the United States, opposed the proposal on the basis that the IWC was still resolving issues related to the harvest of baleen whales, particularly with regard to population estimates, and that changes in the CITES appendices should await the outcome of the IWC deliberations.

Subsequently Norway presented a revised proposal for consideration by the parties. The revision provided that the transfer would enter into force pending scientific confirmation within the IWC framework of an abundance estimate which, under the provisions of the revised management procedures of IWC, would provide for positive quotas for any of these stocks. Again, the United States and other parties stated their opposition to the Norwegian proposal, and the amended proposal was rejected.

Illegal Trade in Whale Meat

Since 1979 CITES Parties have cooperated with the IWC to prevent trade in whale meat from any species or stock protected from commercial whaling by the IWC. As discussed in the previous section on the IWC, a zero catch limit is in effect for most species and populations of great whales, and an IWC resolution adopted in 1994 addresses preventing the importation by any IWC party of whale meat from non-IWC members.

During the past 15 years a number of shipments of whale meat have been stopped or seized by government authorities and were found to be in violation of IWC requirements or domestic regulations. Among the recent incidents are an October 1993 confiscation of 3.5 metric tons of whale meat found in Norway pending shipment to the Republic of Korea; an April 1993 seizure by Russian authorities of 232 tons of whale meat that had been unloaded in Vladivostok for re-export to Japan; and a May 1994 attempt to smuggle 11 tons of frozen whale meat into Japan aboard a Korean freighter.

Heightened international efforts are needed to better control illegal trade in whale meat. At its May 1994 meeting the IWC passed a resolution calling for cooperation and exchange via CITES of information related to illegal trade in whale meat. At the ninth Conference of Parties, CITES members also adopted a resolution, proposed by the United States, recognizing the need for IWC and CITES to cooperate and exchange information on international trade in whale products. The resolution urged all countries to report any incidents involving illegal trade in whale products to the CITES secretariat.

Chapter VII

MARINE MAMMAL STRANDINGS AND DIE-OFFS

There appears to have been an increase since the late 1970s in the incidence of unusual marine mammal mortalities throughout the world. These incidents have occurred in widely separated geographic areas and have involved a broad range of species, including monk seals in the Northwestern Hawaiian Islands, harbor seals and humpback whales in New England, sea lions in California, manatees in Florida, and bottlenose dolphins along the east and Gulf coasts of the United States. The largest and most publicized events were the deaths of more than 700 bottlenose dolphins along the U.S. mid-Atlantic coast in 1987-1988, of more than 17,000 harbor seals in the North Sea late in 1988, and of more than 1,000 striped dolphins in the Mediterranean Sea in 1990-1991.

The mass mortalities of harbor seals in the North Sea and striped dolphins in the Mediterranean Sea appear to have been caused by a morbillivirus, congeners of which cause distemper in dogs and measles in humans. Retrospective analyses of tissues done in 1993 indicate that the mass mortality of bottlenose dolphins along the U.S. mid-Atlantic coast in 1987-1988 may also have been caused by a morbillivirus.

A variety of environmental contaminants was found in the blubber, liver, and other tissues of some of the bottlenose dolphins and striped dolphins that died. These contaminants may have affected the animals' immune systems and made them more vulnerable to the virus. Unfortunately, available information is insufficient to determine how, or at what levels and in what combinations, environmental contaminants may affect marine mammals.

As noted in the Marine Mammal Commission's previous annual report, evidence of morbillivirus infection was found in 1993 in bottlenose dolphins in the Gulf of Mexico. Also, a retrospective analysis of serum samples collected between 1971 and 1991 indicated that phocine morbillivirus has been present in the New England harbor seal population since 1986 and perhaps earlier.

Unusual Mortality Events in 1994

There were no reported incidents in 1994 of large-scale marine mammal mortalities anywhere in the world. In the United States, there were several unusual but comparatively small-scale events. These are described below.

Bottlenose Dolphins

From February through April 1994, 220 bottlenose dolphins were found dead on beaches in Texas, 67 of these in a single 10-day period. In an average year, fewer than 80 bottlenose dolphins wash up dead on Texas beaches during the same three months. Thus, the mortality rate in 1994 was nearly three times the average for the period. Most of the animals were badly decomposed, indicating they had been dead several days before washing ashore and probably had died in offshore rather than nearshore waters. Post-mortem analyses done by the Armed Forces Institute of Pathology found evidence of morbillivirus in tissue samples from 18 of 25 of the dead dolphins, suggesting the mortalities may have been caused by the virus.

Common Dolphins

Between 3 April and 9 June 1994, 46 common dolphins stranded in California, primarily in San Luis Obispo and Santa Barbara Counties. Twenty of the animals were alive when they stranded. By comparison, the number of common dolphin strandings throughout California averaged less than 25 a year in the preceding five years. The animals that stranded in 1994 did not exhibit a common pattern of pathology. Serum antibody tests for morbillivirus, calicivirus,

and retrovirus and tests for biotoxins were all negative. Contaminant analyses found no significant differences between the stranded animals and animals caught and killed incidentally in commercial fisheries. The stranding rate returned to the normal range in early June.

Fraser's Dolphins

On 13 July 1994 two Fraser's dolphins were found dead near Tampa, Florida, and a group of dolphins were seen milling offshore. Subsequently, 28 animals either beached on shore or were stranded in shallow water. One of these animals later died. One animal remained near the shore but did not strand. Blood samples were collected from the 27 live stranded animals. Preliminary analyses of the samples found that blood chemistries and cell counts were within what was judged as a normal range. Facilities were not available to hold or treat the animals and, as time passed, several dolphins worked their way off the beach. They continued to mill in shallow water but otherwise appeared to behave normally. Therefore, the remaining animals were walked into deeper water and released simultaneously. These animals joined those milling offshore and the entire group swam away. The animals were not sighted during follow-up aerial and boat surveys, and there have been no further reports of strandings. Further tests of the blood samples collected indicated that 9 of the 27 animals released had antibodies to morbillivirus. It is not known why the animals stranded.

Related Concerns

Many of the bottlenose dolphins presently in captivity were taken from areas in the northern Gulf of Mexico where evidence of possible morbillivirus-caused mortality has been found. Some captive display and research facilities in the Gulf area maintain dolphins in natural seawater pens where, depending upon how morbillivirus is transmitted, the dolphins possibly could be exposed to the virus. Dolphins sometimes are transferred from one facility to another. If infected with the virus, animals that are transferred could expose dolphins in other facilities to the virus. Recognizing the possible threat to captive dolphin populations, the Department of Agriculture's Animal and Plant Health Inspection Service in August 1994 requested the Commission's comments on a draft information alert that it was developing to advise public display facilities of the possible threat and a questionnaire it had prepared to ask operators of the facilities how they thought the threat might best be minimized. The Commission, in consultation with its Committee of Scientific Advisors, reviewed the draft package and provided comments to the Service on 7 October 1994. The Commission concurred with the intent of both the information alert and the proposed questionnaire. It suggested ways that both could be improved. At the end of the year, the Service had not yet finalized these documents.

The Regional Marine Mammal Stranding Networks

Marine mammal strandings can take many forms. They may involve single animals that die nearshore of natural causes and wash up on adjacent beaches, animals that come ashore because they are sick or injured, pinniped and sea otter pups that are abandoned or orphaned, or mass strandings of large groups of live animals for reasons that are unknown. Much of what is known about the general distribution, morphology, and anatomy of marine mammals has been derived from studies of dead stranded animals. Additionally, much of what is known about the physiology, diseases, and care and maintenance of marine mammals has been derived from efforts to rescue and rehabilitate live-stranded animals.

In 1977 the Marine Mammal Commission sponsored a workshop to review available information concerning marine mammal strandings and determine how data obtained from studies of both live- and dead-stranded animals might contribute to the conservation and protection of marine mammals. The workshop participants described the types of information that could and ideally should be obtained from stranded marine mammals. Among other things, they recommended that regional stranding networks be organized to provide a more efficient means for obtaining and disseminating such information (see Appendix B, Geraci and St. Aubin 1979).

In response to the workshop recommendations, the National Marine Fisheries Service established five regional stranding networks covering the northeast (New England, New York, New Jersey, Maryland, and Virginia), the southeast (North Carolina, South Carolina, Georgia, Florida, Alabama, Texas, Puerto Rico, and the U.S. Virgin Islands), the southwest (California and Hawaii), the northwest (Oregon and Washington), and Alaska. Scientists and others with expertise and interests in stranded marine mammals participate in the networks according to terms and conditions set forth in letters of authorization issued by the National Marine Fisheries Service. The Service has designated a person in each of its regional offices to coordinate collection and dissemination of information concerning marine mammal strandings.

In 1993, the last year for which complete data are available, the regional networks reported strandings of 34 species of cetaceans (1,210 individuals) and 10 species of pinnipeds (2,671 individuals). The regional networks provide the principal means for detecting and initiating investigation of unusual marine mammal mortality events such as those described earlier.

Response to Unusual Mortality Events

As noted in previous Commission reports, the Oceans Act of 1992 added a new title to the Marine Mammal Protection Act: Title IV — Marine Mammal Health and Stranding Response. Among other things, this new title directed the Secretary of Commerce to (1) establish a Marine Mammal Unusual Mortality Event Working Group to provide advice on measures necessary to be better prepared to detect and respond appropriately to future unusual marine mammal mortality events, (2) develop a detailed contingency plan for responding to such events, (3) establish a fund to compensate persons for certain costs incurred in responding to unusual events, (4) develop objective criteria for determining when rehabilitated marine mammals can be returned to the wild, (5) continue development of the National Marine Mammal Tissue Bank (see below), and (6) establish and maintain a central database for tracking and accessing data concerning marine mammal strandings.

The Secretary of Commerce delegated responsibility for implementing these directives to the National Marine Fisheries Service. As noted in the Commission's previous annual report, the Service, in consultation with the Commission and the Fish and Wildlife Service, established a working group in 1993 to advise on measures necessary to better detect and respond to unusual marine mammal mortality events. The group held its first meeting on 1-2 April 1993 and met again on 15 March 1994. During the second meeting, the working group reviewed and provided comments on a draft contingency plan then being prepared by the National Marine Fisheries Service for responding to unusual marine mammal mortality events. The group also provided advice on variables that should be considered in developing criteria for deciding when rehabilitated marine mammals can safely be returned to the wild.

With regard to the last point, the working group noted that there basically are two questions that must be answered: (1) is the animal likely to survive and live a reasonably normal life if released, and (2) could the animal be carrying an infectious disease that would jeopardize the wild population. The group also noted that a variety of biological, behavioral, and ethical factors would have to be considered in addressing these questions.

Following the 15 March 1994 working group meeting, the National Marine Fisheries Service established three *ad hoc* panels to recommend criteria for deciding when rehabilitated animals can safely be released. The reports of these panels have been completed and are to be provided to the working group for consideration at its next meeting, expected to be held in the first quarter of 1995.

On 13 June 1994 the National Marine Fisheries Service published a *Federal Register* notice requesting comments on the Draft National Contingency Plan for Response to Unusual Marine Mammal Mortality Events. The Commission, in consultation with its Committee of Scientific Advisors, reviewed the draft contingency plan and provided comments to the Service on 12 September 1994. In its comments, the Commission noted that parts of the draft plan appeared intended to advise the general public of what has been and is being done to be better prepared to

respond to unusual marine mammal mortality events, whereas other parts appeared intended to advise the directors of the Service's regional offices of what they should be doing to be prepared to respond to unusual mortality events. The Commission suggested ways whereby the draft plan might be revised and expanded to be more useful. The Commission recommended that the Service develop and circulate a second draft for review and comment by the Commission and others. During the Commission's annual meeting in November 1994, the Service noted that a redraft of the contingency plan was nearly completed.

On a related matter, members of the Commission's Committee of Scientific Advisors noted that relatively few laboratories have the expertise and equipment to determine whether viruses, such as morbillivirus, may have caused or contributed to unusual marine mammal mortalities. The Committee noted that the Department of Agriculture's laboratories at Plum Island, New York, and Ames, Iowa, have exceptional capabilities for viral detection and isolation, and recommended that the National Marine Fisheries Service make arrangements with one or both of these laboratories to routinely conduct viral screens of tissue samples collected from marine mammals that may have died from viral infections.

The Commission transmitted the Committee's recommendation to the Service by letter of 19 December 1994. In addition to the recommendation concerning viral screening, the Commission recommended that the Service (a) determine the types of other screens that might help facilitate prompt identification of other causes of unusual marine mammal mortality events (*e.g.*, environmental contaminants and naturally occurring biotoxins), (b) identify the facilities best equipped to do such screens, (c) make arrangements, as possible, with the appropriate facilities to carry out various screens, and (d) advise the stranding networks of arrangements that are made.

National Marine Mammal Tissue Bank

As noted in previous Commission reports, efforts to determine the possible cause of the unusually high bottlenose dolphin mortality along the mid-Atlantic coast in 1987 and 1988 were hampered by lack of information on the types and levels of chlorinated hydrocarbons, trace metals, and other environmental contaminants present in the affected population before the unusual mortality event. To minimize such impediments to future investigations, the National Marine Fisheries Service's Office of Protected Resources initiated development in 1989 of a National Marine Mammal Tissue Bank, which is maintained as part of the National Biomonitoring Specimen Bank at the National Institute of Standards and Technology. Partial support for the tissue bank was provided by the Minerals Management Service, which at that time was independently archiving tissues from selected marine mammals taken by Alaska Native subsistence hunters.

Early in the development of the tissue bank, the National Marine Fisheries Service established an independent team of scientists to provide advice on the types of tissues that should be archived and how the tissues should be collected, stored, and made available to be most useful. The Service also began a quality assurance and contaminant monitoring program. As part of the quality assurance program, the National Institute of Standards and Technology has prepared and made available to laboratories a homogenate of frozen whale blubber, with certified levels of 27 congeners of polychlorinated biphenyls and 15 chlorinated pesticides, to be used as a standard reference.

Title IV, which as noted earlier was added to the Marine Mammal Protection Act in 1992, mandates that these programs be continued. Collectively, the National Marine Mammal Tissue Bank, the quality assurance and contaminant monitoring programs, and the regional marine mammal stranding networks described earlier constitute the National Marine Fisheries Service's marine mammal health and stranding response program. The background, components, and current status of efforts to develop and implement this program are described in a July 1994 NOAA Technical Memorandum (NMFS OPR-94-2) titled "Marine Mammal Health and Stranding Response Program: Program Development Plan." A member of the Marine Mammal Commission staff serves as a member of both the Working Group on Unusual Marine Mammal Mortality Events and the team of scientists providing advice on development of the National Marine Mammal Tissue Bank.

Chapter VIII

IMPACTS OF MARINE DEBRIS

Plastic and other synthetic materials lost and discarded in the marine environment have become a major form of ocean pollution. Marine debris poses hazards to human health and safety, it degrades aesthetic quality, and it adversely affects local economies directly through clean-up costs and indirectly through reduced tourism. Marine debris also is a source of mortality and injury to many species of marine mammals, seabirds, sea turtles, fish, and shellfish due to entanglement and ingestion. As discussed in previous annual reports, the Marine Mammal Commission was an early leader in acknowledging the broad scope of marine debris impacts on marine life and it encouraged cooperative international efforts to prevent and mitigate marine debris pollution. Activities and developments in 1994 are discussed below.

Review of Biological Impacts

As a contribution to the Third International Conference on Marine Debris in May 1994 in Miami, Florida (see below), the staff of the Marine Mammal Commission undertook a review of available information on the entanglement of marine life in marine debris. As part of the review, a list was compiled of all species identified in documented incidents involving entanglement or ingestion of marine debris. The results confirmed that marine debris is a broad-scale pollutant that affects a significant portion of the world's marine life.

Interactions with marine debris have been reported in all the world's oceans. As shown on Table 10, entanglement or ingestion incidents have been reported for at least six of the world's seven sea turtle species, 43 percent of the world's 312 seabird species, and 41 percent of the world's 115 marine mammal species. The data for fish and shellfish are probably the most incomplete. Although records were found for only 69 species of fish and shellfish, it is likely that virtually all species of fish and shellfish caught regularly by commercial fishermen also are killed in lost and discarded fishing gear.

The literature indicates that, while both entanglement and ingestion can cause the death or serious injury of individual animals, entanglement is far more lethal. Indeed, it appears probable that animals unable to free themselves quickly from entangling debris will die due to injuries from abrasion, impaired ability to catch food, inability to avoid predators, or sheer exhaustion from the drag of attached material. In some species, however, ingestion occurs at higher rates.

The occurrence of entanglement and ingestion also varies greatly among species, and most species appear to be susceptible primarily to one or the other type of interaction but not both. For example, entanglement is more common than ingestion for most marine mammals. Entanglement records only were found for 23 marine mammal species (primarily seals and baleen whales), ingestion records only were found for 16 marine mammal species (all toothed whales), and both entanglement and ingestion records were found for just eight marine mammal species. Conversely, for seabirds, ingestion of debris is far more common than entanglement in most species and was the only reported form of interaction for 84 species. Among the relatively few species that appear to be equally susceptible to both entanglement and ingestion are manatees and sea turtles.

Not all marine debris items pose a threat to marine life. The debris items most often found entangling animals are net fragments and monofilament line from commercial and recreational fishing boats and strapping bands and rope probably from all types of vessels. The most commonly ingested items vary greatly by species depending on feeding strategies.

Table 10. The number and percentage of marine species worldwide with documented marine debris entanglement and ingestion records by species group

Species Group	Total No. of Species Worldwide	Species with Entanglement Records No. (%)	Species with Ingestion Records No. (%)	Species with One or Both Types of Records No. (%)
Sea Turtles	7	**6 (86%)**	**6 (86%)**	**6 (86%)**
Seabirds	**312**	**51 (16%)**	**108 (35%)**	**135 (43%)**
Sphenisciformes (Penguins)	16	6 (38%)	1 (6%)	6 (38%)
Podicipediformes (Grebes)	19	2 (10%)	0 (0%)	2 (10%)
Procellariiformes (Albatrosses, Petrels, & Shearwaters)	99	10 (10%)	60 (61%)	61 (62%)
Pelicaniformes (Pelicans, Boobies, Gannets, Cormorants, Frigatebirds, & Tropicbirds)	51	11 (22%)	8 (16%)	17 (33%)
Charadriiformes (Shorebirds, Skuas, Gulls, Terns, Auks)	122	22 (18%)	39 (32%)	49 (40%)
Other Birds	--	**5**	**0**	**5**
Marine Mammals	**115**	**31 (27%)**	**24 (21%)**	**47 (41%)**
Mysticeti (Baleen Whales)	10	6 (60%)	2 (20%)	6 (60%)
Odontoceti (Toothed Whales)	65	4 (6%)	19 (29%)	20 (31%)
Otariidae (Fur Seals and Sea Lions)	14	11 (79%)	1 (7%)	11 (79%)
Phocidae (True Seals)	19	8 (42%)	1 (5%)	8 (42%)
Sirenia (Manatees and Dugongs)	4	1 (25%)	1 (25%)	1 (25%)
Mustellidae (Sea Otter)	1	1 (100%)	0 (0%)	1 (100%)
Fish	--	**34**	**33**	**60**
Crustaceans	--	**8**	**0**	**8**
Squid	--	**0**	**1**	**1**
Species Total		**135**	**172**	**262**

Plastic bags and small plastic fragments were the most commonly reported debris items in digestive tracts of sea turtles, toothed whales, and manatees, while plastic pellets and small fragments of manufactured plastic were most common in seabirds.

The threat of marine debris to individual species or populations is poorly understood. Entanglement rates are difficult to assess because there is no reliable way to detect entangled animals at sea where they are most likely to be entangled, die, and disappear. Also, entanglement rates measured from dead stranded animals or land-based colonies, where most entanglement work has been done, may include only those animals that become entangled close to shore or in debris small enough to allow them to swim or fly

back to land. That is, animals that become entangled at sea are likely to sink or be consumed by predators before they can return or drift to shore and be counted by land-based observers. Ingestion impacts are difficult to assess for similar reasons that are further compounded by a lack of external signs readily visible to observers.

Nevertheless, strong circumstantial evidence exists to suggest that marine debris impacts for at least some species constitute a serious conservation issue. Based on land-based observations, entanglement rates of between 0.1 and 1 percent have been reported for colonies of several species of seals, including northern fur seals, Cape fur seals, Australian fur seals, and Hawaiian monk seals. While these rates themselves are not alarming, they reflect minimum rates that may well underestimate total entanglement rates by an order of magnitude or more. The only useful at-sea entanglement database for a marine species is for loggerhead sea turtles captured for tagging in the eastern North Atlantic Ocean. While entangled loggerhead turtles are rarely reported by scientists studying animals that haul out to nest on beaches, six percent of about 800 animals captured at sea in a recent study had some sort of entangling debris attached.

The potential for significant rates of entanglement also is suggested by innate behaviors that cause animals to actively seek out and interact with debris. Sea turtles, for example, appear to confuse drifting rope, plastic bags, and plastic bottles for food; cormorants and gannets purposely collect netting, line, and plastic sheeting to construct nests; and juvenile seals deliberately approach and manipulate floating net fragments and other debris as objects of play. Such behaviors undoubtedly increase the likelihood of animals becoming entangled. Lost and discarded fishing gear designed explicitly to take advantage of the swimming and movement patterns of fish and crabs can pose entanglement hazards that may persist for years for those species.

Many species affected by marine debris are considered endangered or threatened. Some, including manatees, Hawaiian monk seals, and northern right whales, are among the world's most endangered marine species. In such cases, even low levels of mortality or serious injury can be a determining influence on whether or not a species will recover.

In light of the findings and the predominance of fishing debris in reported entanglement incidents, the Commission's review recommended a number of actions for incorporation into fishery management programs. Among other things, these included implementing measures for reporting on when, where, and how nets and traps are lost by fishermen; initiating pilot programs to investigate the feasibility of retrieving lost gear in areas where it is likely to be concentrated; requiring fishermen to retain derelict gear caught during fishing operations for on-land disposal; instituting incentives for fishermen to return used fishing gear for on-land disposal (*e.g.*, gear deposits or bonuses for returning used gear); ensuring that convenient reception facilities are available in fishing ports to accept derelict or old fishing gear; and evaluating new technologies to decrease gear loss (*e.g.*, automatic float releases that would allow float lines to stay submerged where they would not be cut or towed by passing boats) and to enhance the likelihood that lost gear can be relocated quickly (*e.g.*, attaching sonic devices or sonar reflectors to gear).

The results of the review were presented at the Third International Conference on Marine Debris in May 1994 (see below) and were submitted for publication in a Conference proceedings volume expected to be available in 1995.

The Third International Conference on Marine Debris

The Third International Conference on Marine Debris was held on 8-13 May 1994 in Miami, Florida. Its purpose was to review recent information on marine debris pollution and mitigation measures, particularly in the Wider Caribbean Region, and to recommend practical measures to control major sources of marine debris. Like the two previous conferences held in Hawaii in 1984 and 1989, lead responsibility for organizing and coordinating the 1994 conference was assumed by the Marine Entanglement Research Program of the National Oceanic and Atmospheric Administration. Additional Conference sponsors included the Center for Marine Conser-

vation, the Intergovernmental Oceanographic Commission, the Marine Mammal Commission, the Society of the Plastics Industry, the U.S. Coast Guard, the U.S. Environmental Protection Agency, and the U.S. Navy.

The keynote address for the Conference was delivered by the Commandant of the U.S. Coast Guard, a leading proponent of adopting Annex V of the International Convention for the Prevention of Pollution from Ships, probably the most important international agreement governing marine debris pollution. To meet the Conference objectives, invited papers and posters were presented and working groups were established in six areas: (1) the amounts, types, and distribution of marine debris; (2) the impacts of marine debris; (3) vessel sources; (4) recreational sources; (5) rural and upland sources; and (6) urban discharges. During the session on impacts, a Marine Mammal Commission representative reviewed information on the entanglement of marine life.

During the Conference, each working group prepared a report with recommended actions for review and adoption in plenary session on the final day of the Conference. The Working Group on Amounts, Types, and Distribution of Marine Debris reviewed the status of international efforts to assess marine debris pollution. Its report underscored the importance of identifying different monitoring objectives and sampling design features at the outset of planning for any assessment program.

The Working Group on Impacts reviewed biological, ecosystem, and economic effects of marine debris and recommended steps to address research, management, and monitoring needs. Among other things, the working group encouraged the establishment of reporting systems to collate data on marine debris impacts; studies to resolve uncertainties concerning the significance of sub-lethal ingestion effects on sea turtles and seabirds; research to determine the ultimate fate of plastic products that break down in the marine environment; research on the extent to which plastic debris may accelerate the movement and introduction of epiphytic marine organisms to new ocean areas; assessments of the magnitude of economic impacts; various measures to mitigate the effects of ghost fishing (including points in the preceding section); and greater efforts to apply successful solutions, such as product substitutes for hazardous debris items, more broadly.

The Working Group on Vessel Sources focused on actions to implement garbage discharge restrictions under Annex V of the International Convention for the Prevention of Pollution from Ships. Its report highlighted the need to integrate implementation of Annex V with other international programs bearing on the control of marine pollution and with national land-based solid waste disposal systems. Among the broad range of activities recommended were efforts to expand the number of contracting parties to Annex V; reduce amounts of solid waste generated by ships; establish "green vessel" and "green port" programs that reflect commitments to meeting Annex V requirements as well as other pollution control standards; assess alternative means of financing port reception facilities and operations; and carry out public education, mariner training, and enforcement programs to achieve compliance with Annex V.

The Working Group on Recreational Use examined marine debris generated by recreational fishing, boating, diving, and beach use. Among the many actions recommended by this working group were developing legislation, incentives, and technology aimed at reducing plastic packaging and increasing opportunities for reuse and recycling; broadening programs to recycle monofilament fishing line; developing trash compactors and other waste-handling equipment for recreational craft; targeting marine debris education and outreach programs to recreational user groups; developing a universal symbol for marine debris that manufacturers could use on product labels; and soliciting help from recreational users in beach clean-ups, reporting violations, and gathering data in marine debris monitoring programs.

The Working Group on Urban Sources focused on debris generated by sewage outfalls, stormwater runoff, and industrial facilities. To develop recommended actions, the group considered five basic objectives: (1) source reduction; (2) on-land management and technology to control entry of solid wastes into the marine environments; (3) clean-up once debris enters the marine environment; (4) education programs; and (5) enforcement. Among the actions

recommended by this working group were standardized use of materials that are easier to recycle and constitute less of a threat; manifests for tracking particularly significant marine debris items (*e.g.*, plastic pellets and fishing gear); better trash management practices at construction and industrial sites; technologies to remove floatable debris in stormwater runoff systems; periodic surveys to identify debris accumulation points in need of clean-up; enlisting civic organizations, businesses, and residents to clean up debris in stormwater drainage areas; expanding clean-up work through court-ordered community service sentences and use of low-risk prisoners; and taxing producers, sellers, and/or consumers of items with a high potential of becoming marine debris to cover clean-up costs.

The Working Group on Rural and Upland Discharges considered the marine debris problem in the context of international efforts to control land-based sources of pollution and develop solid-waste disposal systems. Its recommendations focused on building political commitments at international, national, and local levels; enforcing and administering laws that incorporate fees or other economic instruments to cover costs of cleaning up and handling solid wastes; strengthening education and awareness efforts that reflect local cultural practices and beliefs; increasing marine debris monitoring programs; and forming long-term institutional frameworks to develop and maintain solid waste management infrastructure.

By the end of 1994 the working group reports had been distributed by the National Oceanic and Atmospheric Administration to involved agencies and a summary report of the meeting was in press. A separate volume of papers presented at the Conference is to be published late in 1995.

Pilot Fishing Gear Retrieval Project

Ghost fishing is the catching of marine life in lost and discarded nets and traps; it has long been recognized as an inevitable consequence of losing commercial fishing gear. With one notable exception, little attention has been paid to its effect on fish stocks. It has been dismissed largely because some have hypothesized, without justification, that although gear can last for years in the ocean, it loses its ability to catch fish because of configuration changes, degradation, collapse, burial, or other factors. The one exception has been action taken in recent years to require the use of degradable escape panels on traps that are timed to open after a set period of exposure to water.

The Commission's review of marine debris impacts on marine life presented at the Third International Conference on Marine Debris examined past studies of ghost fishing. It found that there have been few studies of the subject, that information on the long-term fate of lost gear, particularly gillnets, and their catch rates is very limited, and that almost no effort has been made to gather data on how much or where gear is lost or what fishermen do with old fishing gear. Conversely, the review identified information that suggests that the ghost-fishing impacts may well be substantial in at least some areas. For example:

- an estimated 31,600 pots were lost in Alaska's Bristol Bay king crab fishery in 1990 and 1991; assuming each trap caught and killed just one legal-sized crab per year, the annual catch would be 205,400 pounds of king crab;

- an estimated 11 percent of the traps in the British Columbia Fraser River dungeness crab fishery were lost in 1984; the estimated unretrieved catch in those traps was 21,000 kg, equal to about 7 percent of that year's landed catch of dungeness crab;

- 300 metric tons of sablefish (equal to about 7.5 to 30 percent of annual landings) were estimated to have been lost in derelict traps off British Columbia from 1977 to 1983;

- an estimated 5 to 30 percent of the lobster traps in use off New England are lost annually; in 1978 an estimated 670 metric tons of lobster were caught in derelict traps;

- lost gillnets observed by a remotely operated camera off New England over a three-year period continued to catch fish and crabs and had not completely collapsed by the end of the study;

- nine lost gillnets were found during a submersible search of about 0.4 km^2 of ocean bottom off New England and 2,240 lost gillnets were estimated to be present in 1987 in 64 nmi^2 at two major New England gillnet fishing areas; and

- lost gillnet retrieval efforts off Newfoundland, Canada, recovered 148 nets in 64 sets in 20 days in 1975, 176 nets in 82 sets in 24 days in 1976, 16.5 nets in 86 sets in 15 days in 1984, and no nets in 22 sets in five days in 1984; the nets recovered in 1975 had 3,000 kg of fish and 1,500 kg of crab; the nets recovered in 1976 had 5,000 kg of fish and 2,500 kg of crab.

In light of the review of this information and recommendations included in the report of the 1994 International Marine Debris Conference, the Commission wrote to the National Marine Fisheries Service recommending support for a pilot fishing gear retrieval project off New England to develop better information on the amount of such material on fishing grounds and what it may be catching. As discussed in the following section, the Commission wrote on 20 May and again on 15 December 1994 recommending partial support for such a project through the Marine Entanglement Research Program.

On 27 July 1994 the Commission wrote the Service's Office of Sustainable Development and International Affairs, the office responsible for distributing $30 million in emergency financial assistance and grants to help New England fishermen no longer able to fish because of a collapse in regional groundfish stocks. A portion of the funds were for projects that would eliminate fishing pressure on groundfish stocks and provide economic relief for fishermen. The Commission's letter asked that funds be used to hire displaced commercial fishermen in New England to test the feasibility of locating, recovering, and properly disposing of gillnets lost in the region's groundfish fishery.

With its letter, the Commission attached a suggested scope of work for a two-year derelict fishing gear retrieval project. The Commission noted that the project could reduce a potentially significant source of mortality for depleted groundfish as well as lobster stocks, increase the amount of fish available for harvesting by fishermen, reduce hazards posed by derelict gear to active fishing gear, provide a temporary source of income for at least some displaced fishermen, provide data needed to estimate the amount of lost gear present and the extent to which it was catching and killing commercially valuable fish, and help determine whether directed gear retrieval work would be a cost-effective mitigation measure to be continued and perhaps tried in other areas or other fisheries.

The Commission again wrote to the Service on 30 November 1994 providing copies of its review and its earlier letters to the Service. The Commission recommended that the Service either entertain bids from commercial fishermen to undertake a pilot gear retrieval project off New England or that it assign one of its own ships to carry out the project. The Commission also recommended that partial support for the work be provided through the Service's Marine Entanglement Research Program. Noting the existence of a large pile of derelict lobster gear near Gloucester Harbor, Massachusetts, the Commission suggested that an appropriate part of the recommended work would be to retrieve such concentrations of debris to document what, if anything, might be being caught and also to remove the threat.

The Commission had not received a reply to its letters at the end of 1994.

The Marine Entanglement Research Program

The National Marine Fisheries Service has carried out a program to study and mitigate marine debris pollution since 1985. Plans for the program's first year were developed jointly by the Marine Mammal Commission and the Service. In recent years Congress has appropriated between $650,000 and $750,000 per year for support of the program, and it has become a cornerstone of U.S. efforts to address the issue. As directed by Congress, the Service has annually sought Commission concurrence on its plan for funding priority projects.

To help identify priority work for 1995, the Service convened a meeting on 21-22 June 1994. Prior to the meeting, the Marine Mammal Commission had written suggesting support of a pilot project to retrieve lost and discarded lobster traps and gillnets off New England. During the meeting an alternative funding source was identified and it was agreed that the project should be reconsidered if funding under that program was not obtained.

As a result of the meeting, the Service developed a funding plan and sent it to the Commission for review in late November 1994. The recommended plan proposed support in the amount of $624,100 for 14 tasks. Many of the projects involved joint support from other agencies and organizations. Included were the following nine projects started in previous years:

- removing entangling debris from beaches used by Hawaiian monk seals and freeing entangled monk seals;
- assessing marine debris effects on endangered sea turtles in the North Atlantic;
- organizing an annual national volunteer beach clean-up effort;
- designing and implementing a national marine debris monitoring system to detect trends in the sources and amounts of debris;
- collecting data on amounts of marine debris at sea through the National Marine Fisheries Service fishery observer program;
- maintaining a long-term marine debris sampling program for remote Alaska beaches;
- maintaining a public information and outreach program on marine debris-related effects, legal requirements, and source reduction measures;
- implementing a marine debris reduction program involving fishermen and ports in the Gulf of Maine; and
- maintaining a full-time program coordinator.

In addition, support also was recommended for a marine debris outreach program for the Wider Caribbean Region, a fourth marine debris workshop to coordinate research and management activities in countries throughout the Caribbean, a marine debris newsletter to update participating agencies and organizations on progress and new developments, and work to help implement Annex V of the International Convention for the Prevention of Pollution from Ships. The plan also included hiring a statistician to help develop the national marine debris monitoring network and to archive and analyze data from the monitoring network and other sources. Should the new position be delayed or not materialize, alternative tasks, including the fishing gear retrieval projects in New England and Alaska, were identified.

On 15 December 1994 the Commission, in consultation with its Committee of Scientific Advisors, commented on the plan. The Commission concurred with the proposal and recommended that, if a statistician cannot be hired, the funds be reallocated to one or both of the derelict fishing gear retrieval projects.

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

The International Convention for the Prevention of Pollution from Ships, signed in 1973 and amended in 1978 by a protocol, provides an international framework for controlling accidental and deliberate pollution of the marine environment by discharges from ships. The Convention, also called the MARPOL Convention, includes five annexes, each of which sets forth regulations to address a specific form of vessel-related pollution: Annex I addresses oil pollution; Annex II, noxious liquid substances carried in bulk; Annex III, harmful substances carried in packaged form or freight containers; Annex IV, sewage; and Annex V, ship-generated garbage.

While nations acceding to the Convention are obligated to follow regulations in Annexes I and II, they must ratify the other three optional Annexes separately if they wish to accede to their provisions. In addition, work is underway to develop two new annexes to control air emissions and to prevent the transport of unwanted aquatic organisms in ballast water.

The principal features of Annex V are (1) discharge limits on the disposal of ship-generated garbage at sea, including a ban on all disposal of plastics (see Table 11); (2) the designation of "special areas"

in which more stringent discharge restrictions apply; and (3) requirements that ports in nations party to the Annex have suitable, convenient reception facilities to receive and properly dispose of ship-generated garbage returned to port. The Annex applies to all non-governmental ships, offshore platforms registered with any party government, and non-party nation ships when in the coastal waters of a party government.

On 31 December 1987 Annex V entered into force when 31 countries, including the United States, representing 50 percent of the world's commercial shipping tonnage had submitted instruments of ratification. Signatory nations had to implement domestic laws and regulations consistent with the Annex by 31 December 1988 when the provisions of Annex V became effective. By the end of 1994, 69 nations representing 67 percent of the world's commercial shipping tonnage had ratified or otherwise accepted Annex V, and five non-member states had ratified the Annex as well.

The International Maritime Organization, which includes 150 member states, oversees cooperative actions relative to the MARPOL Convention through its Marine Environment Protection Committee. In the United States, the U.S. Coast Guard has lead responsibility for implementing Convention provisions and for representing the United States at meetings of the Committee.

U.S. Implementing Laws and Regulations

In December 1987 Congress passed the Marine Plastic Pollution Control Act authorizing the U.S. Coast Guard to implement the provisions of Annex V. Because Congress previously had passed the Act to Prevent Pollution from Ships to implement Annexes I and II of the Convention, the new Act was incorporated as an amendment to the earlier Act. The 1987 law exceeded the provisions of Annex V by (1) applying to all navigable waters of the United States (including inland rivers and lakes not covered under Annex V), and (2) limiting the exemption for U.S. government vessels to a five-year period ending on 31 December 1993. As discussed in the previous annual report, the U.S. Navy was unable to meet this deadline and Congress extended the period for Navy compliance.

With the legislative authority provided by Congress in 1987, the Coast Guard developed and implemented conforming regulations. It published interim rules on 28 April 1989, followed by a 4 September 1990 notice announcing adoption of most of the interim rules as final. Some parts of the proposed regulations, however, did not receive clearance by the Office of Management and Budget and were deleted from the final rules. Among these was a section requiring vessels to maintain a log documenting garbage discharges. Because it is difficult to observe illegal discharges that occur at sea and to document the source of discharged garbage in the ocean, the record-keeping measure was considered an important means of checking compliance with Annex V discharge restrictions.

Because of this importance, proposed rules addressing the need were published by the Coast Guard in May 1993. The proposed rules called for all U.S. ships longer than 40 feet and engaged in commerce, as well as all fixed and floating platforms, to maintain a log identifying when and where garbage is offloaded in port, transferred to another ship, discharged overboard, or incinerated. For discharges into the sea, the logbooks also required a description the contents of the garbage according to several specified categories (*e.g.*, plastics, floating packing material, ground or unground solid wastes other then plastic, food waste, incinerated ash, and incinerated plastic residue). By examining the logs, receipts from port reception facilities, the garbage aboard a ship, and onboard garbage processing equipment, enforcement agents or inspectors boarding a vessel could assess whether a vessel was complying with the discharge requirements.

On 18 April 1994 the Coast Guard published a notice announcing that the proposed record-keeping rules had been adopted; the rules took effect on 19 May 1994.

As efforts to implement Annex V took place, ways to strengthen the program became apparent. In 1993 legislation was introduced to enhance U.S. efforts to implement Annex V by amending the Act to Prevent Pollution from Ships and the Marine Plastic Pollution Research and Control Act. Its intent was to clarify and expand the Coast Guard's authority for requiring

Table 11. Summary of garbage discharge limitations under the International Convention for the Prevention of Pollution from Ships (1973-1978) and the U.S. Act to Prevent Pollution from Ships, as Amended

Type of Garbage	Discharge Prohibitions for All Vessels		Discharge Prohibitions for Offshore Platforms and Associated Vessels[3]
	Outside Special Areas[1]	Inside Special Areas[2]	
Plastics, including synthetic ropes and fishing nets and plastic bags	Disposal prohibited	Disposal prohibited	Disposal prohibited
Dunnage, lining, and packing materials that float	Disposal prohibited less than 25 n.mi. from nearest land	Disposal prohibited	Disposal prohibited
Paper, rags, glass, metal bottles, crockery, and similar refuse	Disposal prohibited less than 12 n.mi. from nearest land	Disposal prohibited	Disposal prohibited
Paper, rags, glass, *etc.*, comminuted or ground[4]	Disposal prohibited less than 3 n.mi. from nearest land	Disposal prohibited	Disposal prohibited
Food waste not comminuted or ground	Disposal prohibited less than 12 n.mi. from nearest land	Disposal prohibited less than 12 n.mi. from nearest land	Disposal prohibited
Food waste comminuted or ground[4]	Disposal prohibited less than 3 n.mi. from nearest land	Disposal prohibited less than 12 n.mi. from nearest land[5]	Disposal prohibited less than 12 n.mi. from nearest land
Mixed refuse types	Apply most stringent disposal restriction	Apply most stringent disposal restriction	Apply most stringent disposal restriction

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 listed in Annex V are the Mediterranean, Baltic, Red, Black, and North Seas; the Persian Gulf/Gulf of Oman; the Wider Caribbean Region; and the Antarctic Ocean. However, at the end of 1993 only the North Sea, the Baltic Sea, and the Antarctic Ocean Special Areas were actually in effect because nations bordering the other listed areas had not yet affirmed to the IMO that adequate port reception facilities were in place.
3 Offshore platforms and associated vessels include all fixed or floating platforms engaged in exploitation or exploration of seabed mineral resources and all vessels alongside or within 500 m of such platforms.
4 Comminuted or ground garbage must be able to pass through a 25-mm (1-inch) mesh screen.
5 For the Special Area in the Wider Caribbean Region only, disposal is prohibited within 3 rather than 12 n.mi. from the nearest land.

foreign vessels visiting U.S. ports to maintain refuse disposal records, carry shipboard solid waste management plans, and post placards. The bill, S. 1459, also clarified the use of civil penalties for garbage discharge violations, the role of the Animal and Plant Health Inspection Service of the Department of Agriculture in inspecting ships for evidence of Annex V violations, and a number of other points. The bill was not reported out of Committee in 1993 and thus was not acted upon. In 1994 new bills were drafted to address many of the points in the 1993 bill. The House bill, H.R. 4668, was passed, but the Senate bill, S. 2373, did not reach the full Senate and was, therefore, not passed in 1994. At the end of 1994 it was the Commission's understanding that a new legislative proposal would be put forward as an Administration bill in 1995.

Actions by the Marine Environment Protection Committee

During 1994 the Marine Environment Protection Committee of the International Maritime Organization met twice. Among other things, it worked on two issues relevant to Annex V: (1) adoption of guidelines for port reception facilities; and (2) proposed amendments to Annex V. In both cases, the underlying proposals had been made by the Coast Guard on behalf of the United States.

With regard to guidelines for port reception facilities, the Marine Mammal Commission drafted the proposal submitted by the Coast Guard to the 24th session of the Committee in 1986. It recommended that guidelines be developed on actions to implement the requirements of Annex V, including the provision for assuring that adequate port reception facilities exist for receiving garbage returned to port by ships. At its 25th session in 1988 the Committee agreed and adopted a set of guidelines initially drafted by several U.S. agencies, including the Marine Mammal Commission.

Experience in developing port reception facilities made clear the need to expand this short guideline section. Therefore, at the 30th session of the Committee in 1990, the Coast Guard submitted a paper drafted by the Marine Mammal Commission, recommending that information and advice in this section be updated. The Committee agreed and, based largely on work supported by the National Oceanic and Atmospheric Administration's Marine Entanglement Research Program, the Coast Guard submitted a thorough review of the subject. However, because similar advice was needed for other Annexes, the Committee agreed to The Netherlands' proposal to develop a manual with guidelines for all MARPOL Convention annexes.

U.S. work to update the guidelines on port reception facilities for garbage therefore was folded into development of the comprehensive manual. A final draft manual was completed during the 34th session of the Committee in July 1993, and during the 35th session in March 1994 a final manual on port reception facilities for all MARPOL Annexes was adopted. Among other things, the manual advises on administrative arrangements and procedures for establishing and operating port reception facilities, the types and costs of equipment, space and siting considerations for equipment, and means of notifying vessel operators about the availability and use of port reception equipment and services.

As indicated above, U.S. statute and regulation to implement Annex V include some measures not specifically mandated by Annex V, but which strengthen the likelihood of achieving close compliance with discharge restrictions. Three such measures are requiring the posting of placards advising crew and passengers of discharge restrictions; having vessels carry solid waste management plans; and maintaining records of when and where garbage is discharged. Given the importance of these measures, the Coast Guard submitted a paper to the 34th session of the Marine Environment Protection Committee recommending that Annex V be amended to incorporate provisions on all three points. Because some questions were raised, the Committee established a correspondence group of concerned member nations led by the United States to resolve them and report back to the Committee.

At the Committee's 35th session on 7-11 March 1994, the Coast Guard submitted the correspondence group's paper summarizing comments and recommending amending language. Another proposal to

amend Annex V was submitted by Germany, and the Committee therefore asked the correspondence group to continue work on drafting a proposed amendment text.

The Coast Guard submitted the results of the group's further work to the 36th Committee session held on 31 October-4 November 1994. Specific proposals to change Annex V require (1) that all ships greater than 12 meters post placards advising passengers and crew of garbage-related discharge requirements, (2) that ships greater than 400 gross tons carry waste management plans outlining onboard garbage handling and processing procedures, and (3) that ships greater than 400 gross tons that carry at least 15 people on an international voyage maintain records of garbage disposal operations. The Committee approved the proposal and directed that it be circulated to members with a view to adopting it at the 37th session in September 1995. The Committee also moved to continue the correspondence group to develop guidelines on implementing the new requirements for shipboard waste management plans.

If the amendment is adopted at the 37th session, signatory nations will have one year to change their domestic programs, and the new provisions could enter into force as early as January 1997. In the United States, conforming amendments to the Act to Prevent Pollution from Ships would be required to grant the Coast Guard authority to enforce the new requirements on foreign vessels entering U.S. ports. Such authority already exists for domestic ships.

Conference of Parties

On 1-3 November 1994, during the period of the 36th Session of the Marine Environment Protection Committee, a Conference of Parties to the MARPOL Convention considered Convention amendments to strengthen the enforcement authority of the governments in which ports are located. The amendments would add a new regulation to Annexes I, II, III, and V to clarify that duly authorized officials of party governments may inspect foreign ships in ports under their jurisdiction for compliance with operational requirements of each Annex whenever it appears that essential pollution prevention procedures of an Annex are not being met. In such cases, the amendments further call on party governments to ensure that problems are corrected to meet Annex requirements before allowing the ship to sail.

During the Conference, the amendments were adopted under a tacit amendment process and signed by 51 of the 56 party governments represented at the conference, including the United States. Under this process, the amendments will be deemed to be accepted on 3 September 1995 unless more than one-third of the parties to the Convention or parties representing more than 50 percent of the world's gross commercial shipping tonnage file objections with the International Maritime Organization. If accepted, the new amendments would enter into force on 3 March 1996.

Monitoring Marine Debris Pollution

To evaluate management actions to prevent or mitigate marine debris pollution, information is needed on the types, amounts, and trends in marine debris pollution. The following long-term marine debris sampling programs are notable examples of efforts to gather such information in the United States: (1) continuation by the National Marine Fisheries Service of studies started in the early 1970s to sample marine debris on selected remote beaches in Alaska, (2) a systematic five-year sampling program started in 1988 and completed in 1993 by the National Park Service under an agreement with the Marine Entanglement Research Program, to monitor marine debris on selected national seashores around the United States, and (3) continuation of data collection in conjunction with volunteer beach clean-ups organized each fall since 1988 in all coastal states by the Center for Marine Conservation.

As noted in previous annual reports, the Marine Entanglement Research Program, at the recommendation of the Marine Mammal Commission, developed a marine debris survey manual to encourage surveys and standardize procedures to sample marine debris on beaches, the sea surface, and the sea floor. Almost all marine debris studies done to date, however, have been limited to sampling debris on beaches because of the high cost of at-sea research. And, while studies to date have provided useful information

on the types of marine debris and, in a few cases, sources of debris, they generally have not provided a statistically sound basis for detecting trends in the amounts of debris or the occurrence of debris components. The principal obstacles to trend detection have been the variability in amounts of debris at any time on individual beaches, the variability in environmental conditions at different sampling locations, and the limited sampling levels of most studies done to date.

One of the few monitoring studies to successfully detect trends and identify debris sources has been done by the National Park Service at the Padre Island National Seashore. Through a sampling program begun in 1989, the Service's studies correlated beach debris with seasonal shrimp fishing activity and offshore petroleum platforms. The findings concerning illegal trash discharges by commercial shrimp fishermen have been provided to appropriate State and Federal officials for follow-up surveillance and enforcement action.

Because detecting trends in marine debris occurrence is so essential to understanding the problems, the Environmental Protection Agency contracted with the Center for Marine Conservation to organize a working group of scientists to describe a national program to detect and monitor trends in the occurrence of marine debris. The first working group meeting was held in February 1993 to discuss monitoring objectives and methodologies.

In November 1993 the working group met to review the results of past monitoring programs and to discuss an appropriate sampling scheme. To develop the latter, it was agreed to subject data from long-term monitoring programs to a power analysis to determine the level of sampling required to produce statistically significant results. Preliminary results of the analysis were reviewed at a working group meeting organized by the Center on 8 May 1994. At that meeting it was agreed that further analysis was warranted, and support for doing so was subsequently provided by the Marine Entanglement Research Program.

Early in 1995 the Center for Marine Conservation will hold another working group meeting to review final results of the power analysis and recommend an approach to developing a statistically reliable monitoring program. As possible, support for monitoring work may be provided by the Marine Entanglement Research Program and perhaps other agencies.

Activities in the Wider Caribbean Region

Because of seasonal wind and current patterns in the Gulf of Mexico, certain Gulf coast areas, such as Padre Island National Seashore in south Texas, receive alarmingly high concentrations of beach-cast marine debris. In view of this, special efforts have been made to address marine debris pollution in the Gulf of Mexico and other parts of the Wider Caribbean Region. (The term "Wider Caribbean Region" as used in this chapter refers to areas subject to the jurisdiction of the Caribbean Environment Program and includes nations bordering the Caribbean Sea and the Gulf of Mexico, and The Bahamas.)

When, for example, the U.S. Senate gave advice and consent to ratify Annex V of the MARPOL Convention in 1987, it focused on the Gulf by directing the Coast Guard to seek an amendment to Annex V to add the Gulf of Mexico to the Annex's list of five other Special Areas. While the Coast Guard did so, other Caribbean nations noted that ships entering or leaving Gulf ports might discharge their trash just outside the Gulf and thereby increase marine debris pollution in the Caribbean Sea. Accordingly, the U.S. proposal was expanded to add the entire Wider Caribbean Region, including the Gulf of Mexico, to Annex V. The amendment, adopted in 1991, became part of the Annex in April 1993.

According to Annex V, the Special Area designation for the Wider Caribbean Region, however, cannot be enforced until nations bordering the Special Area advise the International Maritime Organization that port reception facilities for garbage are in place throughout the region. While the United States has advised the organization that facilities are in place in this country, other nations in the region have not yet done so. Therefore, developing adequate port reception facilities for garbage as well as other marine debris research and management needs continues to

receive considerable attention in the Wider Caribbean Region.

Development of a Caribbean Marine Debris Action Plan

In October 1990 a regional workshop was held in Caracas, Venezuela, to consider marine pollution issues related to oil spill response and the designation of a Special Area under Annex V. Regarding the latter issue, participants recommended, among other things, that a regional marine debris action plan be developed. The Secretariat for the Intergovernmental Oceanographic Commission's Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE) agreed to develop the plan and in the fall of 1991 the first of a series of Caribbean marine debris workshops was held in Puerto Rico to discuss actions that should be taken to address marine debris pollution in the region.

Based in part on workshop results, the IOCARIBE Secretariat developed a draft plan that was reviewed at a second workshop on 17-19 August 1992 in Merida, Mexico, and a third workshop on 11-14 January 1994 in Nassau, The Bahamas. Based largely on these meetings, the IOCARIBE Secretariat completed the *Marine Debris Waste Management Action Plan* for the Caribbean early in 1994. To develop an integrated assessment and control program for marine debris, it described 15 actions to implement public awareness and coastal clean-up campaigns, encourage nations to ratify the MARPOL Convention and Annex V, provide technical assistance to implement the MARPOL Convention (see discussion of World Bank project below), promote recycling and other waste reduction approaches, develop strategies to reduce wastes generated by cruise ships, and develop a program to monitor marine debris amounts and trends.

IOCARIBE is responsible for the Marine Pollution Assessment and Control Program for the Wider Caribbean (CEPPOL), which is jointly sponsored by the Intergovernmental Oceanographic Commission and the United Nations Environment Programme. To help raise money to implement tasks in the marine debris action plan, the IOCARIBE Secretariat submitted the final plan for approval by the CEPPOL Group of Experts at its meeting on 11-13 April 1994 in San Jose, Costa Rica. As a related matter, representatives of the Marine Mammal Commission, the Environmental Protection Agency, and the National Marine Fisheries Service submitted a joint paper on the action plan's task to monitor marine debris. The paper recommended an inter-comparison exercise to develop and test a regional marine debris monitoring program for the Wider Caribbean Region and provided advice on forming a regional marine debris monitoring network, selecting marine debris sampling sites, and analyzing survey results.

During its meeting, the CEPPOL Group of Experts agreed to include funds for supporting work in the marine debris action plan as part of its recommended biennial budgets for 1994-1995 and 1996-1997. It also endorsed the inter-comparison exercise on marine debris.

Shortly after the CEPPOL meeting, the Intergovernmental Oceanographic Commission's Committee for the Global Investigation of Pollution in the Marine Environment (GIPME) held its Eighth Session in San Jose, Costa Rica, on 18-22 April 1994. As noted in previous annual reports, one Committee objective is to develop manuals of procedures for monitoring different types of marine pollutants. At the Committee's sixth session in 1986, a representative of the Marine Mammal Commission suggested that the Committee also develop a manual on procedures for monitoring marine debris. In June 1992 a marine debris survey manual prepared for the Marine Entanglement Research Program was submitted to the Committee by the National Oceanic and Atmospheric Administration and the Marine Mammal Commission. The Committee recommended steps to publish and distribute the document in its series of manuals and guides.

For the Committee's eighth session in April 1994 the Marine Mammal Commission drafted a paper inviting the Committee on GIPME to endorse the recommendation by the CEPPOL Group of Experts to undertake an inter-comparison exercise in the Wider Caribbean Region to test and refine procedures in the marine debris survey manual. The Committee did so and offered its full support for the proposed funding

in the current and forthcoming CEPPOL biennium budgets.

Related Activities

While work to develop the regional marine debris action plan was being undertaken, initial steps were taken to address some of its identified needs. For example, the World Bank announced plans in 1993 for a $5.5 million grant through its Global Environment Facility (GEF) fund to assist nations in the Wider Caribbean Region with analyses and preparations for ratifying and implementing the MARPOL Convention and Annex V. To date, only 15 of the region's 29 nations have ratified the Convention and only 13 have ratified Annex V.

In 1994 the International Maritime Organization was designated as the executing agency for the project, entitled the Wider Caribbean Initiative on Ship-Generated Waste, and work began with the provision of legal and technical assistance to help regional nations develop institutional authorities to implement MARPOL requirements. Assuming that most regional nations ratify the Convention and Annex V, a second-phase program may be pursued with international funding organizations to fund port reception facilities, waste management infrastructure, and institutional training programs.

Steps also have been taken to develop a public awareness and education program on marine debris under the aegis of the Secretariat for IOCARIBE and with partial support from the Marine Entanglement Research Program and the Environmental Protection Agency's Gulf of Mexico Program. Although work was delayed in 1993 and 1994, the Center for Marine Conservation was eventually retained to design a program plan. The Center has established a regional marine debris information office to begin program implementation in 1995.

Chapter IX

MARINE MAMMAL MANAGEMENT IN ALASKA

Marine mammal conservation in Alaska presents extraordinary challenges. The complexity of marine mammal issues is increased by the large populations of several species within and adjacent to State waters, the State's extensive and often remote coastline, the use of marine mammals by Alaska Natives for subsistence purposes, interactions with fisheries and coastal and offshore oil and gas development, increased ecotourism, and the fact that jurisdiction over many populations is shared with Russia and/or Canada.

In 1994 the Commission continued to devote attention to a number of critical issues in Alaska and surrounding areas. Of particular importance were the development of species accounts, conservation plans, and recovery plans for several species of Alaska marine mammals; a marking and tagging program to collect data on Native subsistence harvests and help control illegal taking and trading in marine mammal products; assessment of possible changes in environmental conditions in the Gulf of Alaska and Bering Sea ecosystems; and measures to predict, detect, and mitigate possible effects on marine mammals of offshore oil and gas activities. The first two topics are addressed below; the Gulf of Alaska/Bering Sea ecosystems and oil and gas exploration are discussed in Chapters V and X, respectively.

Species Accounts, Conservation Plans, and Recovery Plans

To develop a strong base for marine mammal research and management programs in Alaska, the Marine Mammal Commission initiated efforts in the mid-1980s to prepare species accounts with research and management recommendations for ten marine mammal species. The species were walruses, polar bears, ringed seals, bearded seals, ribbon seals, spotted seals, harbor seals, Steller sea lions, beluga whales, and sea otters. Working groups were formed to help summarize and evaluate information on each species, and primary authors were contracted to write the accounts. The accounts were published in 1988 as *Selected Marine Mammals of Alaska: Species Accounts with Research and Management Recommendations* (see Appendix B, Lentfer 1988).

Also in 1988 Congress amended the Marine Mammal Protection Act to direct that the Secretaries of Commerce and the Interior develop conservation plans for depleted marine mammal species or populations. It also directed the Secretaries to consider developing conservation plans for non-depleted species that would benefit from such documents. Conservation plans are similar to recovery plans required under the Endangered Species Act and are intended to provide a framework for planning needed research and management actions.

When the Commission transmitted the completed species accounts to the Fish and Wildlife Service and the National Marine Fisheries Service, it recommended that certain accounts be used as the basis for developing conservation plans as called for by the new amendments. Specifically, it recommended that the Fish and Wildlife Service use the walrus, polar bear, and sea otter accounts and that the National Marine Fisheries Service use the Steller sea lion account for that purpose.

The Fish and Wildlife Service agreed with the Commission's recommendation and immediately began work on plans for all three species using the Commission's species accounts as source documents. Progress was interrupted by the *Exxon Valdez* oil spill in March 1989, but in 1991 the Commission worked closely with the Service to re-initiate the planning process. As discussed in the sections on each species

in Chapter IV, the Service completed all three plans in 1994 and proceeded with efforts to implement needed actions.

The National Marine Fisheries Service also agreed with the Commission's recommendation and in 1989 began work on a conservation plan for Steller sea lions. However, results of a 1989 population survey indicated that a precipitous decline in the species' abundance was continuing and that intensified research and management efforts would be needed in coming years. In light of the decline, in 1990 the Service designated the Steller sea lion as threatened under the Endangered Species Act and proceeded to develop a recovery plan, rather than an conservation plan, for the species. The Commission's original species account for Steller sea lions was used as a major source document and the plan was adopted late in 1992. Work carried out under the plan in 1994 is discussed in Chapter IV.

Because of the change in the Steller sea lion population status and the significant amount of new information that had been gathered, in 1991 the Commission decided the species account should be updated. Little progress was made on a revision during 1992-1993, and in 1994 a new author was chosen to complete the project. The account is expected to be completed in 1995.

As with Steller sea lions, population surveys for harbor seals early in the 1990s also revealed alarming declines throughout much of the species' range in Alaska. At the same time, there were growing indications that killer whales had been affected by the *Exxon Valdez* oil spill and that fishermen in Alaska were shooting killer whales to keep them from taking fish caught on long lines. Therefore, the Commission decided in 1990 to update its harbor seal species account and to prepare an account for killer whales. Both reports were completed in 1994 (see Appendix B) and copies were provided to the National Marine Fisheries Service. As recommended by the Commission, the Service also has taken steps to develop a conservation plan for harbor seals. A draft plan was prepared in 1993 and as of the end of 1994 it had not been completed (see Chapter IV).

Planning efforts for northern fur seals in Alaska and for humpback whales in Alaska and other U.S. waters also have received attention from the National Marine Fisheries Service. A final conservation plan for northern fur seals was adopted in 1993. A humpback whale recovery plan was adopted in 1991. Recent research and management actions relative to both species are discussed in Chapter IV.

Federal Marine Mammal Marking and Tagging Regulations

In 1981 the Marine Mammal Protection Act was amended to give 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 purposes of the amendment were to obtain better information on the numbers and species of marine mammals taken for subsistence and handicraft purposes and to help control illegal trade in products from those species.

Marking and tagging regulations were issued by the Fish and Wildlife Service on 28 June 1988. They require that within 30 days of taking a polar bear, walrus, or sea otter, Native hunters must report the take to the Service and present specified parts of the animal to be marked and tagged. Polar bear and sea otter skins and skulls and walrus tusks must all be marked or tagged. Reports from hunters are to 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 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 to the Service for marking by 24 April 1989. Unauthorized possession or transportation of unmarked marine mammal parts is a violation of the Act.

Since promulgating its regulations, the Service has worked closely with Native groups and the State of Alaska to implement the marking and tagging program. At present, 116 individuals in 97 coastal

villages have been trained and authorized to tag parts from marine mammals taken by Alaska Natives and to collect information on the harvested animals. The authorized taggers include Native village residents working under contract to the Service as well as Service employees in Anchorage and at National Wildlife Refuges. Data obtained from the marking and tagging program are maintained by the Service in a computerized database.

In an effort to foster coordination and cooperation among the Native community, in 1994 the Fish and Wildlife Service began publication of a newsletter on the marking, tagging, and reporting program. The newsletter is issued quarterly and is distributed to the authorized taggers and other persons and groups interested in the program.

Table 12. Number of sea otters, walruses, and polar bears presented for marking and tagging by Alaska Natives, 1988-1994

Year[1]	Sea Otters	Walruses	Polar Bears
Pre-rule[2]	499	1,512	123
1988[3]	55	6	132
1989	268	739	99
1990	166	1,466	76
1991	236	2,167	59
1992	639	1,672	63
1993	1,232	1,168	114
1994[4]	710	1,147	--

1 Sea otter and walrus data are provided on a calendar year basis. Polar bear data are provided on the basis of the harvest year, which runs from 1 July of the year indicated to 30 June of the following year.
2 "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 Natives when the regulations became effective.
3 Figures include only marine mammals taken after 26 October 1988. Figures for polar bears include those animals taken between 26 October 1988 and 30 June 1989.
4 Preliminary estimates only. Receipt of harvest certificates for 1994 may not be complete.

In 1991 the Service changed the way in which it maintains polar bear data. While data for sea otters and walruses are maintained on a calendar year basis, polar bear data are recorded by harvest year, which runs from 1 July to 30 June. This change was made to facilitate comparison of recent polar bear harvest data with data from past years.

Data on the number of marine mammals tagged under the Fish and Wildlife Service's program through 1994 are presented in Table 12. Reporting for 1994 is not yet complete and data for that year are preliminary. It should be recognized that some animals may be shot and not recovered so that the numbers in the table likely underestimate the total numbers of animals killed by Natives for subsistence, handicrafts, and clothing.

As clearly demonstrated by the sea otter marking and tagging data, there has been a substantial increase in the number of sea otters taken by Alaska Natives during the past three years. This increase is attributable to the ruling in *Katelnikoff Beck et al.* v. *U.S. Department of the Interior*, discussed in the Commission's previous annual reports. In that ruling late in 1992 the Ninth Circuit Court of Appeals upheld an interpretation of the Marine Mammal Protection Act's Native handicraft provision that allows Natives to create and sell handicrafts fashioned from sea otters, provided that the taking is not wasteful and that traditional methods of production, such as weaving, carving, and stitching, are used.

The possible benefits of implementing a marking and tagging program for certain marine mammal species under National Marine Fisheries Service jurisdiction were discussed at the Commission's 1993 annual meeting. To date, the Service has taken no action to promulgate such regulations for any species taken by Alaska Natives for subsistence, handicraft, or clothing purposes.

However, as discussed in Chapter IV, the Service has contracted for a study of subsistence harvests of Steller sea lions and harbor seals by Alaska Natives, and it regularly monitors subsistence harvests of northern fur seals in the Pribilof Islands.

In commenting on draft stock assessments prepared by the National Marine Fisheries Service under section 117 of the Marine Mammal Protection Act (see Chapter V), the Commission suggested that the Service either implement marking, tagging, and reporting programs or enter into cooperative agreements with appropriate Native organizations to obtain better information on the number, age, and sex of bearded, ringed, and spotted seals taken for subsistence.

Litigation Related to Marine Mammals in Alaska

Because of the multitude of marine mammal species found in Alaska and the special provisions regarding the use of marine mammals by Alaska Natives, activities involving marine mammals in Alaska are often subject to legal challenge. Issues of concern during 1994 are discussed below.

Alaska Wildlife Alliance v. *Jensen*

Under National Park Service regulations adopted in 1985 to protect humpback whales in Glacier Bay, the number of cruise ships and other vessels permitted to enter Glacier Bay National Park is limited during the summer when whales are present. Under the regulations, no more than 107 cruise ships may be authorized to enter the park each summer.

Despite this limit, in 1990 the Service authorized 109 cruise ship entries into Glacier Bay. At that time, the Commission and others questioned the procedures used by the Service to authorize entries in excess of the 107-entry ceiling imposed by its own regulations. On 21 August 1990 the Alaska Wildlife Alliance filed a complaint challenging the National Park Service's decision to authorize additional cruise ship entries. The plaintiffs alleged that the Service, in authorizing those entries, did not follow applicable procedures, exceeded the maximum allowable number established by regulation, and violated the National Environmental Policy Act by not preparing a supplemental environmental assessment. Plaintiffs, however, did not seek injunctive relief, and none of the cruise ship entries authorized for 1990 were enjoined. Since then, the number of cruise ships allowed into Glacier Bay each summer has not exceeded the 107-vessel ceiling.

The plaintiffs also alleged that commercial fishing operations being conducted in Glacier Bay violated applicable law and, in combination with tour boat operations, may be having adverse effects on humpback whales and other cetaceans.

Parties to this lawsuit met in 1991 to try to negotiate a settlement in the case. Inasmuch as the Service was, and still is, in the process of revising the vessel management plan for the park, the parties agreed to suspend consideration of the claims involving vessel entries. (See the humpback whale section in Chapter IV for additional discussion of vessel entries.) The parties agreed to proceed on the issue of whether the Service may allow commercial fishing in the park.

The district court issued its ruling on 1 March 1994. It found that there was no statutory prohibition against commercial fishing activities in the park, except in designated wilderness areas. With respect to the claims involving vessel entries into the bay, the court dismissed them without prejudice, inasmuch as it remained unclear when a revised vessel management plan would be issued.

Another case involving cruise ship entries into Glacier Bay (*Clipper Cruise Line* v. *United States*) was decided in 1994. This case, however, concerned the way in which the allowable number of entries were allocated to competing operators rather than the overall entry limits established by the Service. The court ruled that a new system for allocating cruise ship entries adopted by the National Park Service in 1993 was not contrary to the Administrative Procedure Act even though it resulted in the plaintiff being awarded no entries for the 1995 season.

"Operation Whiteout"

A two-year undercover investigation by the Fish and Wildlife Service into wasteful taking of walruses by Alaska Natives and trade in illegally taken ivory by non-Natives, known as "Operation Whiteout," resulted in the indictment of 26 individuals during 1992 for violations of the Marine Mammal Protection Act, the

Lacey Act, and Federal drug and conspiracy laws. Two additional indictments were brought in 1993. Another three individuals were indicted in 1994 for violations of the Marine Mammal Protection Act stemming from the investigation in "Operation Whiteout." Also, 17 other individuals were served notices of violation and assessment during 1993 and 1994 for lesser misdemeanors connected with the investigation.

Alleged violations included the wasteful taking of walruses (*i.e.*, headhunting and shooting animals that were in the water and thus irretrievable), the illegal sale of marine mammal parts, and the exchange of marine mammal parts for drugs. With the exception of one pending case, all of the cases pursued by Federal prosecutors to date have resulted in convictions or guilty pleas. These include more than 20 misdemeanor violations of the Marine Mammal Protection Act and more than 25 felony and misdemeanor convictions under the Lacey Act based on underlying violations of the Marine Mammal Protection Act. Thus far, 16 defendants have received jail sentences. In addition, two defendants convicted in 1994 are awaiting sentencing.

Three defendants in these cases have pursued appeals. One defendant challenged the sentence imposed rather than the underlying conviction. That sentence was upheld.

The other two defendants sought new trials based primarily on claims that the portions of walrus meat they did not harvest were contaminated by mercury and thus unfit for consumption. In a 27 June 1994 ruling, the Ninth Circuit Court of Appeals upheld the convictions of these two Native hunters. The appellate court found, among other things, that the instructions given the trial court jury were appropriate and did not impermissibly shift the burden of proof to the defendants to show that the unharvested walrus meat was contaminated. The court further ruled, as it had in *United States* v. *Clark*, a 1990 case also involving the wasteful take of walruses, that the regulatory definition of "wasteful manner," which focuses on whether the hunter wastes a "substantial portion" of the marine mammal, was not unconstitutionally vague. Although the convictions were upheld, resentencing of one of the defendants was ordered because of the trial court's possible belief that it was not allowed to depart from applicable sentencing guidelines. Upon reconsideration, the court imposed a longer sentence than it had originally.

A few remaining cases resulting from "Operation Whiteout" are likely to be brought in 1995.

Chapter X

OUTER CONTINENTAL SHELF OIL AND GAS EXPLORATION AND DEVELOPMENT

Exploration and development of coastal and offshore oil, gas, and hard mineral resources may adversely affect marine mammals and their habitat. Under the Outer Continental Shelf Lands Act, the Department of the Interior's Minerals Management Service is responsible for assessing, detecting, and mitigating the adverse effects of these activities in offshore waters beyond state jurisdiction. Under the Marine Mammal Protection Act and the Endangered Species Act, the National Marine Fisheries Service and the Fish and Wildlife Service are responsible for reviewing proposed actions and advising the Minerals Management Service and other agencies of measures needed to ensure that those actions will not have adverse effects on marine mammals or endangered or threatened species. 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 1994 are discussed below.

Proposed Offshore Lease Sales

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviews and comments on environmental impact statements and other matters concerning proposed outer continental shelf oil, gas, and hard mineral lease sales. During 1994 the Commission commented to the Minerals Management Service on a draft environmental impact statement concerning proposed lease sales in the Gulf of Mexico. The Commission also provided information and comments on additional proposed lease sales in the Gulf of Mexico and in the Chukchi Sea as well as the proposed Russian Federation/United States joint oil and gas lease sales in the Chukchi Sea and Hope Basin planning area.

Oil & Gas Lease Sale #148, Chukchi Sea

On 2 February 1994 the Minerals Management Service issued a call for information and nominations and a notice of intent to prepare an environmental impact statement on a proposed oil and gas lease sale in the Chukchi Sea off the northwest Alaska coast.

In response, the Marine Mammal Commission wrote to the Service on 16 March 1994 forwarding information and commenting on factors that should be considered in assessing the possible effects of the proposed action on marine mammals and their habitat. In its letter the Commission noted that at least 12 species of marine mammals, including the endangered bowhead and humpback whales, occur seasonally or year-round in the Chukchi Sea planning area. The Commission noted that many of the species (*e.g.*, bowhead and beluga whales, ringed, spotted, and bearded seals, walruses, and polar bears) are hunted by Alaska Natives for subsistence and handicraft purposes. In addition, some species (*e.g.*, walruses and gray, humpback, bowhead, and beluga whales) are highly migratory and may be affected by oil and gas activities outside as well as within the proposed lease area. The Commission noted therefore that, in addition to assessing possible direct and indirect effects, the environmental impact statement should identify and assess (1) the possible cumulative effects of human activities throughout the ranges of the potentially affected species and (2) how Alaska Natives might be affected by exploration- and devel-

opment-related changes in marine mammal distribution and abundance and by exposure to contaminants through consumption of marine mammals that might be contaminated by spilled oil, drilling fluids, *etc.*

In its letter, the Commission identified five species as being of particular concern in terms of risk and significance of possible impact from the proposed activity. These are bowhead, gray, and beluga whales, walruses, and polar bears. Two other species — ringed seals and killer whales — were considered as meriting special attention.

The Commission noted that most if not all of the western Arctic population of bowhead whales migrates annually through or near the proposed sale area. Thus, the species may be affected by offshore oil and gas activities in the Bering and Beaufort Seas as well as the Chukchi Sea lease area. The Commission suggested that the environmental impact statement should identify and assess the possible cumulative effects of take by Alaska Natives as well as by offshore oil and gas exploration and development throughout the species' range. The statement should also assess the possible effects on the species' distribution and movement patterns and thus the availability of bowheads for taking by Alaska Natives for subsistence purposes.

In its letter the Commission noted that the Chukchi Sea lease area includes important feeding grounds for a significant portion of the eastern Pacific gray whale population, which migrates annually between Arctic waters and Baja California. From 1967 to 1991 the former Soviet Union took an average of 165 gray whales annually on behalf of its Siberian Natives. Gray whales are also taken incidentally in a number of coastal and perhaps high-seas gillnet fisheries and are the focus of growing whale-watching industries in both Mexico and the United States. The species' nearshore distribution and migratory routes expose it to threats from habitat degradation resulting from various human activities. Therefore, the Commission suggested that the environmental impact statement should identify and assess the possible cumulative effects of (a) offshore oil and gas development throughout the species' range, (b) the take for use by Russian Natives, (c) the incidental take in fisheries, (d) whale-watching activities, and (e) other human activities that may affect the species and its habitat.

The Commission further noted that the National Marine Fisheries Service has been conducting periodic surveys to monitor the status of the eastern Pacific gray whale population. It recommended that, if the Minerals Management Service had not already done so, it consult with the National Marine Fisheries Service to determine what if any additional studies are necessary to assess, detect, and mitigate the possible direct and indirect effects of the proposed lease sale and resulting activities on gray whales.

Beluga whales are common in the northeastern Chukchi Sea and regularly use coastal areas and lagoons near the proposed sale area during summer. They are occasionally taken incidentally in coastal fisheries and are routinely harvested by Native hunters for subsistence purposes. The population structure and abundance in western Alaska are not well known. It is suspected that there may be four or five separate stocks. Therefore, the Commission recommended that the environmental impact statement should assess the possible adverse effects on local populations in and near the planning area resulting from incidental takes in coastal fisheries and hunting by Natives, as well as activities associated with oil and gas exploration and development.

Walruses also occur in and near the proposed lease sale area. Like gray whales, they feed on benthic fauna and could be affected both directly and indirectly by oil spills, drilling muds, *etc.* Along with its letter, the Commission forwarded a copy of the draft conservation plan for walruses prepared by the Fish and Wildlife Service. The Commission recommended that, if the Minerals Management Service had not already done so, it consult with the Fish and Wildlife Service to determine what actions the Minerals Management Service should take to help implement the plan.

Polar bears occurring in and near the proposed lease sale area are taken for subsistence purposes by Alaska Natives. Various activities related to offshore oil and gas development may adversely affect important polar bear prey, and oil contamination could interfere with the natural insulating properties of a

bear's coat. In its letter the Commission noted that a polar bear conservation plan was being finalized by the Fish and Wildlife Service. It forwarded a copy of the draft plan and recommended that, if the Minerals Management Service had not already done so, it consult with the Fish and Wildlife Service to determine what actions the Minerals Management Service should take to help implement the plan.

Ringed seals are important both as a primary prey species for polar bears and for subsistence uses by Alaska Natives. The Commission noted that the environmental impact statement should identify and assess the possible cumulative effects of hunting and offshore oil and gas development throughout the species' range.

Under the Outer Continental Shelf Lands Act, it is clear that the Minerals Management Service has the responsibility and the authority to conduct long-term monitoring programs when necessary to ensure that outer continental shelf oil and gas activities do not have adverse environmental impacts, including impacts on marine mammals and their habitats. Therefore, the Commission recommended that the Minerals Management Service, if had not already done so, consult with the National Marine Fisheries Service, the Fish and Wildlife Service, and various Alaska Native groups to identify long-term monitoring studies that may be necessary to ensure that oil and gas exploration and development do not disadvantage marine mammals or alter their availability for taking by Alaska Natives for subsistence purposes.

Oil & Gas Lease Sales #157 and #161, Central and Western Gulf of Mexico

On 3 May 1994 the Minerals Management Service published a call for information and nominations and a notice of an intent to prepare an environmental impact statement on two proposed oil and gas lease sales in the central and western Gulf of Mexico.

In response to the call for information, the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, by letter of 15 June 1994 provided information and comments on factors that should be considered in assessing the possible effects of the proposed action on marine mammals and their habitat. The Commission noted that at least 30 species of marine mammals have been observed in or found stranded along the coast of the northern Gulf of Mexico, including seven endangered species: right, blue, fin, sei, humpback, and sperm whales and the West Indian manatee. The manatee and the sperm whale are the endangered marine mammal species most commonly seen in the Gulf area.

The bottlenose dolphin is the marine mammal species most commonly seen in the area and the species most likely to be affected by offshore oil and gas activities. In its letter, the Commission pointed out that available information suggests there may be a number of more or less discrete coastal populations or sub-populations and a discrete offshore or deepwater stock. The Commission also noted that since 1990 there have been at least four occurrences of unusually high bottlenose dolphin mortality in parts of the northern Gulf (see Chapter VII). It suggested that the environmental impact statement should describe these unusual mortality events and the extent to which they may have affected both regional and local populations or sub-populations of bottlenose dolphins.

The Commission also suggested that, if the Minerals Management 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, abundance, seasonal movement patterns, essential habitats, diet, and status of important prey species of bottlenose dolphins in and near the proposed lease sale areas; (b) determine to what extent bottlenose dolphins in the northern Gulf of Mexico may have been affected by unusual mortality events; (c) determine what other human activities may be affecting bottlenose dolphins in the northern Gulf; and (d) determine what additional research or monitoring programs may be necessary to assess and verify both the direct and indirect effects of offshore oil and gas activities on bottlenose dolphins in the northern Gulf of Mexico.

With regard to the West Indian manatee, the Commission noted that it is unlikely that the species would be affected significantly by the proposed activities. Perhaps the greatest risk is from a major oil spill occurring in the lease sale area, resulting in oil being transported into areas along the west coast of

Florida or eastern Mexico where manatees are found. The Commission therefore suggested that the environmental impact statement include an assessment of the possibility of a major spill occurring and reaching important manatee habitats and concentration areas. The Commission also recommended that, if the Minerals Management Service had not already done so, it consult with the Fish and Wildlife Service to determine what if any additional measures are necessary to assess and avoid the possible adverse impacts of the proposed action on endangered manatees in Florida and eastern Mexico.

With reference to sperm whales and other endangered cetacean species, the Commission pointed out that in 1989 the Minerals Management Service sponsored a workshop to determine what additional information was needed to reliably assess the possible effects of offshore oil and gas activities on these and other marine mammals in the Gulf of Mexico. In response to the workshop's recommendations, the Service funded a series of shipboard and aerial surveys to obtain needed data. In its letter the Commission suggested that the environmental impact statement for the proposed lease sales should describe the ongoing studies and incorporate results obtained to date. In addition, it should provide an assessment of the likelihood that these studies will fully meet the information needs identified in the report from the 1989 workshop. The Commission recommended that the Minerals Management Service consult with the National Marine Fisheries Service and the Fish and Wildlife Service to identify long-term monitoring programs that may be necessary or desirable to ensure that oil and gas activities do not disadvantage marine mammals.

Proposed Lease Sales #152 and #155, Central and Western Gulf of Mexico

Proposed lease sale #152, tentatively scheduled for April 1995, involves 5,759 blocks (approximately 30.9 million acres) of submerged land in the central Gulf of Mexico. Proposed sale #155, tentatively set for August 1995, would offer for lease 5,090 blocks (approximately 27.9 million acres) in the western Gulf. In April 1994 the Minerals Management Service issued a draft environmental impact statement on the proposed lease sales and distributed it to the Marine Mammal Commission and others for review.

The draft concluded that the proposed activities would have "primarily sublethal effects...both chronic and sporadic" on marine mammals. The activities could cause acute or chronic physiological stress, alter normal behavior, and result in some degree of avoidance, either temporary or permanent, of the impacted areas, the draft statement noted. With regard to endangered and threatened species of marine mammals, the draft statement concluded that lethal impacts are expected to be rare.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the draft statement and by letter of 26 July 1994 provided comments to the Service. The Commission indicated that, while the conclusions concerning the possible effects on marine mammals may be correct, the draft statement did not provide data, analyses, or references to support many of them.

As the Commission has noted a number of times in previous comments on proposed OCS lease sales in the Gulf of Mexico, bottlenose dolphins are not distributed uniformly throughout the Gulf and may constitute a number of more or less discrete coastal and/or inshore-offshore populations or sub-populations. The Commission also has noted that the possible effects of live capture and removal of animals for public display, unusually high mortality levels in certain locations, incidental take in commercial fisheries, and habitat degradation and destruction associated with other activities must be considered when assessing the possible effects of offshore oil and gas activities on bottlenose dolphin stocks. The Commission therefore indicated that the environmental impact statement should consider how the proposed action, by itself and in combination with live captures and removals, the incidental take of animals in fisheries, the occurrence of unusually high mortality levels, and habitat degradation, might affect discrete populations.

With regard to the endangered West Indian manatee, the Commission noted that the draft statement provided little information on the distribution, abundance, and productivity of the species. The greatest

risk to manatees may be from the direct and indirect effects of oil from large spills occurring in the proposed lease sale areas being carried by winds and currents to major manatee concentrations and habitats in western Florida, eastern Mexico, and Cuba. The Commission recommended that, if it had not already done so, the Minerals Management Service consult with the Fish and Wildlife Service to obtain the best available information on all manatee populations and habitats that potentially could be affected by the proposed action and any reasonable and prudent alternatives that might be taken avoid or minimize possible adverse effects. The Commission also recommended that, based on the results of those consultations, the environmental impact statement be revised to indicate the distribution, relative abundance and status of manatees along the rim of the Gulf of Mexico and to provide an assessment of the possible direct and indirect effects of a major oil spill on manatee distribution and abundance in known high-use areas.

With regard to cetaceans, the Commission noted its understanding that the Service was supporting studies to better understand the distribution and abundance of both large and small cetaceans in the Gulf and that the National Marine Fisheries Service was conducting various marine mammal assessment and monitoring studies in the area. The results of these studies are referred to in the draft statement but apparently were not considered during its preparation. Therefore, the Commission recommended that, if it had not already done so, the Minerals Management Service should consult its contractors and the National Marine Fisheries Service to obtain the best available information on populations of bottlenose dolphins and other marine mammals that could be affected directly or indirectly by the proposed activities. The Commission noted that the statement should reflect the best available information and describe remaining uncertainties and what is being done or planned to resolve them.

The Commission further recommended that the statement be expanded to more fully describe what is being done to meet the monitoring requirements of the Outer Continental Shelf Lands Act and to ensure that lessees are aware of the Marine Mammal Protection Act's prohibition on taking marine mammals and requirements for obtaining a "small take" exemption.

Proposed Joint Russian/U.S. Lease Sale, Chukchi Sea and Hope Basin

On 6 September 1994 the Minerals Management Service and the Russian Federation Committee on Geology and Use of Mineral Resources published in the *Federal Register* a joint request for expressions of interest and comments on a proposed simultaneous oil and gas lease sale/tender offering. The areas identified for the proposed action were the U.S. Chukchi Sea and Hope Basin planning areas and the adjacent Russian northern and southern Chukchi Sea planning areas.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, provided comments to the Service by letter of 2 December 1994. In its letter, the Commission noted that at least 12 species of marine mammals occur seasonally or year-round in the proposed lease sale areas. They include five species of whales (bowhead, gray, humpback, killer, and beluga whales), four species of pinnipeds (ringed, bearded, spotted, and ribbon seals), harbor porpoises, Pacific walruses, and polar bears. The Commission noted that all the species could be affected by exploration- and development-related activities in the proposed lease sale areas. In the Commission's opinion, however, the species of greatest concern are the bowhead, gray and beluga whales, walruses, ringed seals, and polar bears.

As an attachment to its letter, the Commission provided a list identifying the possible effects of offshore oil and gas development on marine mammals. In addition, the Commission provided a paper describing the results of previously unreported surveys indicating that the proposed lease sale area is an important summer feeding grounds for a significant portion of the North Pacific gray whale population (see discussion of gray whales in Chapter IV).

The Commission also noted that significant portions of the populations of Pacific walruses, bowhead whales, polar bears, and ringed seals, as well as gray whales, are shared with the Russian Federation.

These species have traditionally been taken for subsistence purposes by Natives from both the United States and Russia. In addition, several of the species are highly migratory and may be affected by oil and gas development and other human activities outside the proposed lease sale area. Therefore, the Commission recommended that, before proceeding with the proposed joint lease sale, the Minerals Management Service (1) assess both the direct and indirect (food chain) effects that could occur as a result of the proposed activities, (2) identify and assess the possible additive or cumulative effects of human activities throughout the ranges of the potentially affected species, and (3) identify and assess the ways in which Alaska and Russian Natives might be affected by related changes in marine mammal distribution and abundance.

Small-Take Exemptions

Section 101(a)(5) of the Marine Mammal Protection Act directs the Secretaries of the Interior and Commerce to authorize, in certain instances, the unintentional taking of small numbers of marine mammals by U.S. citizens incidental to activities other than commercial fishing operations. This provision was added to the Act in 1981 to eliminate the need to obtain a waiver of the Act's moratorium on taking marine mammals, which is procedurally more burdensome in those instances when the number of animals likely to be affected is small and the impacts are likely to be negligible.

All forms of incidental taking may be authorized under section 101(a)(5)(A), including lethal taking, as long as only small numbers of marine mammals are taken, the impact on the affected species or stocks is negligible, and there are no unmitigable adverse impacts on the availability of marine mammals for Native subsistence. A new provision, section 101(a)-(5)(D), was added by the 1994 Marine Mammal Protection Act amendments to provide a streamlined mechanism for authorizing the incidental take of small numbers of marine mammals when only taking by harassment is involved.

Authorizations under section 101(a)(5)(A) are issued through a two-step process. If the Secretary, through notice-and-comment rulemaking, determines that taking incidental to a specific activity in a specific geographical area will have a negligible impact on the affected species or stock, and will not have an unmitigable adverse impact on the availability of the species or stock for taking by Alaska Natives for subsistence use, the Secretary is to prescribe regulations setting forth permissible methods of taking and requirements for monitoring and reporting the take. The regulations are to be designed so as to have the least practicable adverse impact on the species or stock and its habitat. Taking authorized by the regulations also must have the least practicable adverse impact on the availability of such species or stocks for subsistence use by Alaska Natives.

The second step in authorizing small takes is issuance of a letter of authorization. Letters of authorization are issued if the Secretary determines that the type and level of taking likely to result from the proposed activities are consistent with the findings made for the class of activities under the regulations. Letters of authorization must specify the period of validity and may include additional terms and conditions tailored to the specific request.

The authorization of incidental harassment under section 101(a)(5)(D) does not require the issuance of regulations. Rather, the Secretary, within 45 days of receiving an application that makes the required showings, is to publish a proposed authorization and request public comment in the *Federal Register* and in newspapers and appropriate electronic media in the locally affected area. After a 30-day comment period, the Secretary has 45 days in which to make a final determination on the application. Authorizations under section 101(a)(5)(D) may be issued for periods of no more than one year and renewed annually.

The National Marine Fisheries Service and the Fish and Wildlife Service have issued regulations and letters of authorization under section 101(a)(5)(A) to allow the incidental taking of small numbers of marine mammals incidental to oil- and gas-related activities. To date, no request for authorization of taking by harassment incidental to such activities has been made under new section 101(a)(5)(D).

Both the National Marine Fisheries Service and the Fish and Wildlife Service have authorized the taking of marine mammals incidental to oil- and gas-related exploration in the Beaufort and Chukchi Seas. The National Marine Fisheries Service has also issued separate regulations and letters of authorization for the incidental taking of ringed seals in the course of oil- and gas-related, on-ice seismic exploration in the Beaufort Sea. In addition, the National Marine Fisheries Service is considering authorizing the take of dolphins incidental to the removal of drilling rigs and related structures in the Gulf of Mexico. Actions with respect to these authorizations are discussed below.

Actions regarding taking incidental to other activities, including taking incidental to ship-shock trials by the Navy off San Nicolas Island, California, are discussed in Chapter XII in the section entitled "Navy Request for a Small-Take Exemption."

Exploration in the Beaufort and Chukchi Seas

On 18 July 1990 the National Marine Fisheries Service published regulations authorizing the nonlethal take of six species of marine mammals (bowhead, gray, and beluga whales and bearded, ringed, and spotted seals) incidental to oil and gas exploration in the Beaufort and Chukchi Seas from 1990 to 1995. Six letters of authorization to take these species incidental to oil and gas exploratory drilling and related operations were issued in 1991. In 1992 and 1993 ARCO Alaska, Inc., was the only firm to request and receive a letter of authorization pursuant to these regulations.

As discussed in previous annual reports, the adequacy of the monitoring programs associated with these authorizations has been of continuing concern to the Commission and others. As a result of a Commission recommendation, a workshop on monitoring the effects of Arctic oil and gas exploration on marine mammals was convened by the National Marine Fisheries Service in March 1992 to provide guidance to the oil and gas industry in developing and implementing required monitoring programs. In preparation for that meeting, the Commission drafted a discussion paper that reviewed the relevant statutory provisions, pointed out how marine mammals might be "taken" in the course of activities associated with offshore oil and gas exploration and development, and described the types of site-specific and long-term population monitoring programs that likely would be required to verify that such taking had negligible effects. That paper (see Appendix B, Swartz and Hofman 1991) is summarized in the Commission's 1992 annual report.

A follow-up workshop was held 24-25 February 1993 to review the results of the monitoring program conducted at ARCO's Kuvlum site in 1992 and to consider the monitoring plan proposed for 1993. Among other things, workshop participants, noting the higher noise levels (about 200 dB) associated with seismic operations planned for 1993, concluded a more extensive monitoring program was necessary. Also, representatives of the North Slope Borough and the Alaska Eskimo Whaling Commission expressed concern about the possible impact of exploratory drilling and related activities at the Kuvlum site on fall bowhead whale hunting by villagers from Kaktovik and Nuiqsut on Alaska's Beaufort Sea coast. They believed that oil- and gas-related activities, particularly seismic surveys, would divert migrating bowhead whales farther offshore, making it more difficult to find whales, exposing whalers to increased risks, and increasing the possibility of meat spoiling before whales could be brought ashore.

Subsequent to the workshop, ARCO submitted a revised 1993 monitoring plan. By letter of 28 June 1993 the Commission commented on the proposed issuance of a letter of authorization to ARCO and on the adequacy of the proposed monitoring plan. The Commission noted that it was not clear from the information submitted by ARCO how or how many bowhead whales and other marine mammals might be taken incidental to its planned activities. It also was not clear how the availability of marine mammals for Native subsistence use might be affected. The Commission further noted that the proposed monitoring program appeared inadequate to determine the numbers and manner in which marine mammals would be taken and to verify that the effects of the planned activities would be negligible and would not adversely affect the availability of marine mammals for Native subsistence. The Commission also pointed out that it would be useful to consider how development and

exploration activities might differ should a major deposit be discovered and to design the current monitoring program to obtain the information that would be needed to predict the effects of development, particularly on bowhead whales and their availability for Native subsistence.

Prior to issuing a letter of authorization to ARCO for taking incidental to its 1993 activities, the National Marine Fisheries Service further revised the monitoring plan. The plan was changed to add a second aircraft for bowhead whale surveys and to increase the acoustic monitoring effort. In addition, ARCO agreed to suspend seismic activities on 15 September if whalers in Barrow, Kaktovik, or Nuiqsut had not yet taken the allowable number of bowhead whales.

The Service issued a letter of authorization to ARCO on 19 July 1993. On 6 August the Alaska Eskimo Whaling Commission filed suit in the U.S. District Court for the District of Columbia (*Alaska Eskimo Whaling Commission* v. *Foster*), seeking a preliminary injunction to halt ARCO's planned activities for the duration of the fall bowhead whale migration. The court in an 8 September 1993 ruling denied the motion for a preliminary injunction. The key issue identified by the court was whether the 1992 bowhead whale hunt "yielded substantial information indicating that noise from the oil and gas exploration will have a significant, deleterious impact on the subsistence hunt." The court found strong support for the government's contention that the 1992 subsistence hunt was not affected by noise from ARCO's activities. The court also found plaintiffs' challenge of the adequacy of the monitoring plan to be without merit. While applicable regulations require ARCO to develop a monitoring plan, the only feature specifically required is that the plan include a qualified biologist or other appropriately experienced observer to monitor the effects of exploration activities on marine mammals. The court therefore ruled that "[a]s long as the plan generates meaningful data to monitor the effects of noise on bowhead whales, the precise methods adopted to achieve that end are not established."

In November 1993 representatives of the Alaska Eskimo Whaling Commission met with National Oceanic and Atmospheric Administration officials to express their continuing concern about the adequacy of the monitoring program. The Native representatives expressed willingness to work with the National Marine Fisheries Service to develop an independent peer review process to ensure that the monitoring programs are adequate to verify that exploration and development activities do not have more than negligible effects on marine mammals or unmitigable effects on their availability for Native subsistence use.

A meeting was held on 8-9 February 1994 to consider how peer review of proposed monitoring studies could be incorporated into the process for issuing letters of authorization for oil and gas activities in the Beaufort and Chukchi Seas. Participants included representatives of interested Federal agencies, including the Marine Mammal Commission, the oil and gas industry, the North Slope Borough, the Alaska Eskimo Whaling Commission, and environmental groups. Although the participants recognized that the National Marine Fisheries Service lacks authority to require peer review of monitoring plans, there was general agreement that peer review would likely result in adoption of improved plans, would engender greater confidence in the adequacy of monitoring efforts, particularly within the Native community, and would lessen the likelihood of future litigation. Participants also agreed that the peer review panel should consist of between 5 and 10 independent experts, representing a diversity of disciplines.

Drawing on the Commission's 1991 discussion paper concerning monitoring programs, meeting participants developed a set of questions to be addressed by the peer review panel. Among the issues are whether the program (1) addresses all marine mammal species that may be taken; (2) is sufficient to determine the number of marine mammals that are affected and to verify that marine mammals are taken only as authorized; (3) is likely to provide reliable information on the distribution, abundance, behavior, and movements of marine mammals in the vicinity of the proposed activities; and (4) is likely to detect possible adverse effects on the availability of marine mammals for Native subsistence. Although the panel would concentrate on reviewing the monitoring programs proposed for the forthcoming season, to the extent time permits, the panel would also be asked to

comment on the draft report of monitoring activities from the previous year.

Meeting participants also agreed to a timetable for completing the review of requests for letters of authorization. Under the agreement, the National Marine Fisheries Service will have 15 days to review an application for completeness and 45 days to convene a panel of experts to review the proposed monitoring plan. The panel will have 15 days in which to formulate and provide its recommendations. The Service will have 10 days from receipt of the panel's recommendations in which to request the applicant to revise its monitoring plan. The applicant will have 10 days to submit a revised monitoring plan. The Service is to issue or deny the application within 106 days of its receipt.

The elements of the agreement reached at the 8-9 February meeting technically applied only to activities authorized for 1994. However, it is not unreasonable to expect that those elements will form the basis of future agreements.

Although the process for independent review and the timetable for reviewing requests for letters of authorization had been agreed to, ARCO decided not to conduct exploratory activities at its Kuvlum site during 1994. Neither ARCO nor any other company requested a letter of authorization in 1994.

The National Marine Fisheries Service regulations authorizing the take of small numbers of marine mammals incidental to oil and gas exploration in the Beaufort and Chukchi Seas expire in August 1995. As such, a new authorization would have to be issued to cover activities for September 1995 and beyond. It remains uncertain whether the oil and gas industry will seek such authorization and, if so, whether it will apply under section 101(a)(5)(A), as in the past, or will seek authorization for taking by harassment only under new section 101(a)(5)(D). If authorization is requested under the new provision, independent peer review of proposed monitoring plans and other research proposals is statutorily mandated if the proposed activity could affect the availability of marine mammals for subsistence use.

As discussed in previous annual reports, a rule governing the take of walruses and polar bears incidental to oil and gas exploration activities in the Chukchi Sea was published by the Fish and Wildlife Service on 14 June 1991. Similar regulations governing the take of these two species incidental to oil and gas operations in and adjacent to the Beaufort Sea were issued by the Service on 16 November 1993. Areas within the Arctic National Wildlife Refuge were specifically excluded from coverage under the small-take authorization.

Rather than the five-year period of validity generally given such regulations, the regulations for activities in the Beaufort Sea area are effective for only 18 months. During this period, the Service, in order to "comport with, and to meet more fully the intent of" the Agreement on the Conservation of Polar Bears, committed itself to develop and begin implementing a strategy for the identification and protection of important polar bear habitats. Extension of the rule beyond the initial 18-month period will be contingent upon the development and implementation of the strategy. At the end of 1994 the Fish and Wildlife Service was finalizing its draft habitat conservation strategy for polar bears in Alaska. The draft strategy is expected to be made available for public review and comment early in 1995. (See Chapters IV and VI for additional discussion of this issue.)

Applicants seeking letters of authorization for activities in and adjacent to the Beaufort Sea are required to consult with Native communities to discuss potential conflicts between the planned operations and subsistence use of the marine mammals. They must also submit a plan setting forth the measures that have been and will be taken to minimize any adverse effects on the availability of polar bears and walruses for Native subsistence use.

Applicants for letters of authorization must also submit a site-specific plan for monitoring the effects of oil and gas exploration activities on polar bears and walruses. These plans, which are subject to approval by the Service's Alaska Regional Director, must specify the techniques that will be used to detect the responses of polar bears and walruses to exploration activities. The Service expects that monitoring

requirements will vary depending on the type of activity, location, and time.

During 1994, 12 letters of authorization were issued to five different companies, allowing the taking of walruses and polar bears incidental to oil- and gas-related activities in the Beaufort Sea. All 12 letters covered taking incidental to exploration activities. Three also included taking incidental to oil and gas development and production activities.

On-Ice Seismic Activities

In 1982 and again in 1987 the National Marine Fisheries Service issued regulations to authorize the taking of small numbers of ringed seals incidental to on-ice seismic activities associated with oil and gas exploration over the outer continental shelf of the Beaufort Sea. The second authorization expired at the end of 1991.

In response to a petition from four oil companies, the National Marine Fisheries Service on 15 September 1992 published a proposed rule to renew the authorization to take small numbers of ringed seals in the course of on-ice seismic operations in the Beaufort Sea from 1993 through 1997. By letter of 15 October 1992 the Commission provided comments on the Service's proposed rule. The Commission concurred that the petition provided a reasonable basis for concluding that only small numbers of ringed seals were likely to be affected by the planned seismic activities and that the effects likely would be negligible. The Commission also noted that, while this or any single drilling or support activity was unlikely by itself to have significant adverse effects, the additive effects could be significant. The Commission pointed out that population monitoring, as well as site-specific monitoring, may be necessary to detect possible cumulative effects. The Commission recommended that, if the National Marine Fisheries Service had not already done so, it should consult with the Minerals Management Service, the Fish and Wildlife Service, the Alaska Department of Fish and Game, and relevant industry and Native groups to agree upon and, as possible, arrange for cooperative funding of a program to monitor the status of ringed seal populations in Alaskan waters. The Commission further recommended that the National Marine Fisheries Service (1) assess whether the activity-specific monitoring program required by the proposed rule is likely to provide an accurate estimate of the number of ringed seals affected by the authorized activities and the nature and significance of the effects, and (2) identify and take into account activities, in addition to Native subsistence hunting and the planned seismic surveys and related support activities, that may affect ringed seals and their habitat in areas offshore of Alaska.

The National Marine Fisheries Service published a final rule on 13 January 1993 granting the requested small-take authority. With respect to monitoring, the regulations require that a qualified individual be stationed to observe and record the presence of ringed seals and ringed seal lairs along the "shot lines" of the exploratory activities and around camps used by oil company employees. While the Service indicated that it would consult with industry and Federal, State, and local agencies concerning a long-term program to monitor the status of ringed seal populations, it did not believe that the low level of on-ice seismic activities that has occurred and that was predicted to occur during the next five years warranted a more extensive monitoring program than that required under the regulations.

Consultations among the interested parties were held as part of a 24-25 February 1993 workshop convened by the National Marine Fisheries Service on monitoring the taking of marine mammals incidental to oil and gas exploration in the Beaufort Sea. Commission representatives suggested that aerial surveys or dogs trained to locate seals might be used to obtain data needed for more accurate estimates of ringed seals taken incidental to the seismic activities. No resolution of the matter was reached, but Service participants appeared satisfied with the current monitoring program.

Four letters of authorization for the taking of ringed seals incidental to on-ice seismic exploration in the Beaufort Sea were issued by the Service during 1994. A letter of authorization, valid only for activities conducted in 1994, was issued to Western Geophysical on 8 February 1994. Letters of authorization, valid from 1 December 1994 to 1 December 1995, were issued to BP Exploration, Western Geophysical, and Schlumberger on 1 December 1994.

Gulf of Mexico

In 1989 the American Petroleum Institute, representing operators who remove offshore oil and gas drilling and production structures and related facilities in the Gulf of Mexico, sought a small-take authorization from the National Marine Fisheries Service. Explosives used to sever pilings, well conductors, and supporting structures as part of the removal process may expose dolphins and other marine mammals to sound and pressure waves that, depending on an animal's distance from the explosion, may result in harassment, injury, or death. The American Petroleum Institute estimated that 670 structures will be removed from Gulf waters during the first five years and that about 5,500 structures will be removed within a 35-year period.

The Service published a proposed rule on 17 June 1993 in response to the American Petroleum Institute's request. The rule would authorize the incidental taking of bottlenose and spotted dolphins, the two species identified by the American Petroleum Institute as potentially subject to taking, over a five-year period. As is the case with a similar authorization under the Endangered Species Act allowing the incidental take of sea turtles, explosives could be detonated only during daylight hours, unless authorized by an on-site representative of the Service, and only after observers determined that no bottlenose or spotted dolphins were present within 3,000 feet of the structure to be removed. This distance was selected based upon a computer model that predicted that a bottlenose dolphin calf would suffer only slight injury from a 1,200-lb. charge detonated in open water at a distance of 4,000 feet. Because in most instances, charges are limited to 50 lbs. and are placed 15 feet below the mudline, the Service assumed that a 3,000-foot safety zone would ensure that there were no serious injuries to dolphins.

The Marine Mammal Commission provided comments on the proposed rule by letter of 16 August 1993. The Commission concurred with the Service's conclusion that the proposed removal operations would have negligible impacts on bottlenose and spotted dolphins, provided that no animals were present within the ranges that tissue and hearing damage could occur when the explosives were detonated. The Commission noted, however, that it was not clear what assumptions the Service had made and what variables it had considered to make the determination that pressure waves generated by the explosives would dissipate to safe levels within 3,000 feet. For example, it was not clear whether bottom type, the maximum charge size that might be used, or the orientation of potentially affected animals to the explosion had all been fully considered.

The Commission further noted that many marine mammal species other than bottlenose and spotted dolphins could potentially be affected by structure removals. The Commission therefore recommended that the proposed rule be revised to authorize the incidental taking of any marine mammal that reasonably can be expected to occur in the northern Gulf of Mexico. Alternatively, the Commission recommended that the Service inform those engaged in removal activities that any incidental taking of marine mammals other than bottlenose and spotted dolphins would not be authorized and would constitute a violation of the Marine Mammal Protection Act, regardless of whether the specified mitigation, monitoring, and reporting requirements were met.

The Commission questioned the proposed provision that would allow Service officials to authorize the use of explosives when darkness or weather conditions would impair the ability of observers to detect marine mammals in the vicinity of the structure to be removed. That provision suggested that the Service was proposing to make determinations on a case-by-case basis as to whether a particular removal operation would take only small numbers of marine mammals or would have negligible impacts. Under the applicable statutory provision, however, such determinations must be made through rulemaking. To overcome this problem, the Commission recommended that the regulatory provision either be expanded to specify and explain the rationale for criteria that would be used to allow Service employees to waive the generally applicable mitigation measures, or be modified to prohibit detonation of explosives when monitoring efforts would not be adequate to detect, with a high degree of certainty, marine mammals within the area where tissue damage or hearing impairment could occur.

The Commission also expressed concern about the proposed monitoring and reporting requirements. In this regard, the Commission recommended that requests for letters of authorization be required to provide more specific information on how marine mammals near a structure being removed would be detected and on the steps that would be taken to verify that no marine mammals were killed or injured by the detonation of explosives. The Commission suggested that, in addition to visual surveys of the blast area, acoustic monitoring might be a useful way to detect marine mammals. With respect to post-explosion monitoring, the Commission suggested that the Service periodically compare reports from holders of letters of authorization with marine mammal stranding data to determine if there are any possible correlations between strandings and structure removals.

As a final concern, the Commission noted that marine mammals could be affected indirectly as well as directly by structure removals. For example, hazardous substances deposited in sediments beneath oil platforms could be resuspended in the water column by explosions and thus enter the marine food web. As top-level carnivores, dolphins would be particularly susceptible to the accumulation of such substances.

At the end of 1994 no final rule had been published. The Service is still reviewing and drafting responses to comments submitted on the proposed rule and is revising an environmental assessment on the action. A final rule is expected to be issued in 1995.

Chapter XI

RESEARCH AND STUDIES PROGRAM

The Marine Mammal Protection Act requires that the Marine Mammal Commission maintain a continuing review of research programs conducted or proposed to be conducted under 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 research on marine mammals; reviews research plans and programs and recommends steps that should be taken to prevent unnecessary duplication and improve the quality of research conducted or supported by the National Marine Fisheries Service, the Fish and Wildlife Service, the Minerals Management Service, and other Federal agencies; convenes meetings and workshops to review, plan, and coordinate marine mammal research; and contracts for studies to help identify, define, and develop solutions to domestic and international problems affecting marine mammals and their habitats so as to facilitate and complement activities of other agencies.

Survey of Federally-Funded Marine Mammal Research

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

In February 1994 the Commission requested information from 21 Federal agencies, departments, and offices. They were the Department of Agriculture; the Department of the Air Force; the Department of the Army; the Department of Commerce's Coastal Monitoring and Bioassessment Division, Coastal Ocean Office, National Marine Fisheries Service, National Sea Grant College Program, Office of Ocean and Coastal Resources Management, and Sanctuaries and Reserves Division; the Department of Energy; the Department of the Interior's Fish and Wildlife Service, Minerals Management Service, National Biological Service, and National Park Service; the Department of the Navy; the Department of State; the Department of Transportation; the Environmental Protection Agency; the National Aeronautics and Space Administration; the National Institutes of Health; and the National Science Foundation. The Commission also requested information from the Smithsonian Institution, a trust instrumentality of the United States.

The information received was summarized in the Commission-sponsored report, "Survey of Federally-Funded Marine Mammal Research and Studies FY74 - FY93," published in July 1994 by the National Technical Information Service (see Appendix B, Waring 1981 through Waring 1994, for reports of the Commission's surveys).

Research Program Reviews, Workshops, and Planning Meetings

In 1994 the Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, reviewed, commented on, and/or made recommendations on matters concerning bottlenose dolphins, spinner dolphins, spotted dolphins, striped dolphins, white-sided dolphins, white-beaked dolphins, Risso's

dolphins, common dolphins, northern right whale dolphins, rough-toothed dolphins, Clymene dolphins, Fraser's dolphins, harbor porpoises, Dall's porpoises, pilot whales, killer whales, false killer whales, pygmy killer whales, melon-headed whales, beluga whales, blue whales, fin whales, sei whales, Bryde's whales, minke whales, humpback whales, gray whales, right whales, bowhead whales, sperm whales, pygmy sperm whales, dwarf sperm whales, beaked whales, Steller sea lions, California sea lions, harbor seals, Hawaiian monk seals, gray seals, harp seals, hooded seals, spotted seals, northern and Guadalupe fur seals, bearded seals, ringed seals, ribbon seals, elephant seals, walruses, polar bears, sea otters, dugongs, and manatees.

The Commission also provided comments on issues involving marine mammal-fisheries interactions; the possible effects of high-energy, low-frequency sound on marine mammals; marine mammals in display facilities; entanglement of marine mammals in lost and discarded fishing gear and other marine debris; the effects of large-scale aquaculture off the coast of Massachusetts; and marine mammal strandings and die-offs.

The Commission, members of its Committee of Scientific Advisors, and its staff also convened, provided background information for, and/or participated in meetings and workshops to:

- evaluate and update basic principles for the conservation of wild living resources;
- review and coordinate international conservation efforts in the Arctic and Antarctic;
- review the Hawaiian monk seal research and management program;
- prepare for the meetings of the 1994 International Whaling Commission and its Scientific Committee;
- review and identify ways to improve policies and regulations concerning the collection and importation of biological specimens and live organisms for scientific study;
- discuss proposed amendments to the Marine Mammal Protection Act;
- coordinate research and management actions to conserve humpback and right whales off the northeastern United States;
- discuss mechanisms for obtaining independent scientific peer review of programs proposed to meet the monitoring requirements of section 101(a)(5) of the Marine Mammal Protection Act;
- discuss recent technical advances and application of molecular genetic research to marine mammal conservation;
- review procedures and criteria for calculating potential biological removal levels for marine mammal stocks;
- review and evaluate data on the incidental take, abundance, and status of harbor porpoises in the northwest Atlantic;
- review and exchange information on the status of the West Indian manatee population in the Wider Caribbean Region and review and update the draft regional management plan;
- evaluate the status of domestic and international actions to document sources and avoid marine debris pollution;
- determine ways to enhance methods for locating, accessing, and integrating geospatial data on marine resources in Alaska;
- improve coordination among Federal agencies regarding marine mammal public display and scientific research permitting issues;
- develop a marine debris monitoring program for the Wider Caribbean Region;
- discuss designing and implementing educational, research, and management programs for the Hawaiian Islands Humpback Whale Sanctuary;
- coordinate efforts by Federal agencies to standardize, archive, and disseminate geospatial data on marine bathymetry;
- provide recommendations on the design of the marine mammal research component of the Acoustic Thermometry of Ocean Climate Program;
- discuss challenges facing, and provide recommendations regarding, the Federal fisheries observer program;
- develop a management and conservation agreement to cooperatively manage shared polar bear populations and their habitats in areas under Russian and U.S. jurisdiction;
- consider draft regulations for implementing the new regime for governing take of marine mammals incidental to fisheries;
- recommend actions to protect Steller sea lions;

- recommend actions to protect polar bears, walruses, and sea otters in Alaska;
- review and suggest ways to improve a draft strategic plan for the National Oceanic and Atmospheric Administration's Protected Species Program;
- discuss ratification of the Law of the Sea Convention;
- identify priority research and management needs for the 1995 National Marine Fisheries Service's Marine Entanglement Research Program; and
- evaluate the status of efforts to implement the manatee recovery program in the southeastern United States.

Commission-Sponsored Research and Study Projects

Under the Marine Mammal Protection Act, the Departments of Commerce and the Interior have primary responsibility for acquiring data needed to develop and assess the effectiveness of programs to 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.

Beginning in November 1993 much of the Fish and Wildlife Service's research responsibilities were transferred to the National Biological Service, then called the National Biological Survey. Responsibility for much of the research carried out by the Minerals Management Service and the National Park Service also was transferred to the National Biological Service.

As noted earlier, the Commission convenes workshops and contracts for research and studies to help identify, define, and evaluate threats to marine mammals and their habitat. It also supports other research to further the purposes and policies of the Act. Since it was established, the Commission has contracted for approximately 984 projects ranging in amounts from several hundred dollars to $150,000. The amount spent annually on research and studies since 1986 has averaged about $100,000.

Occasionally 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, the Minerals Management Service, and the Department of State. When such funds are transferred from the Commission to another agency, the Commission provides detailed scopes of work describing precisely what the agency is to do or to have done, as well as the requirements for reporting on progress to the Commission. In many instances, this has made it possible for agencies to start needed research sooner than might otherwise have been possible and 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.

In calendar year 1994 the Commission used approximately $98,000 of its own funds to support research and studies. Research undertaken in 1994 also included projects co-sponsored by the Department of State, the Fish and Wildlife Service, and the National Marine Fisheries Service, for which these agencies transferred $168,550 to the Commission. Research and studies supported by the Commission in 1994, including those funded jointly by the Commission and other Federal agencies, are described below.

Final reports from most Commission-sponsored studies are available from the National Technical Information Service; they are listed in Appendix B. Papers and other publications resulting entirely or in part from Commission-sponsored activities and published elsewhere are listed in Appendix C.

RESEARCH PLANNING AND COORDINATION

Support to the Cetacean Specialist Group (Species Survival Commission, IUCN-The World Conservation Union, Chicago Zoological Society, Chicago, Illinois)

Action plans prepared by Specialist Groups of The World Conservation Union's Species Survival Commission identify critical conservation problems and research and management actions necessary to over-

come the problems. In 1987 the Cetacean Specialist Group prepared a five-year cetacean action plan entitled "Dolphins, Porpoises, and Whales, An Action Plan for the Conservation of Biological Diversity: 1988-1992." The plan identified more than 50 projects and actions for the conservation of cetaceans. The Commission provided partial support in 1994 to publish an update of the plan. The plan, entitled "Whales, Dolphins, and Porpoises, 1994-1998" (see Appendix C, Species Survival Commission 1994), will promote public awareness and implementation of programs necessary to protect and permit recovery of endangered and threatened cetacean species.

Determining Causes of Sea Otter Mortality (Joseph M. Groff, D.V.M., University of California, Davis, California)

In 1991 the Fish and Wildlife Service and the California Department of Fish and Game began sending all recently dead southern sea otters to the Service's National Wildlife Health and Research Center in Madison, Wisconsin, for necropsy. The intent of the program was to determine, when possible, the cause of death and to detect mortality patterns in the population. The Fish and Wildlife Service held a meeting on 28-29 April 1994 to review the results and determine whether to continue the necropsy program. The meeting was attended by representatives of the Fish and Wildlife Service's Ecological Services, the National Biological Service's National Wildlife Health and Research Center, the California Department of Fish and Game, the Monterey Bay Aquarium, the California Sea Otter Recovery Team, and various academic institutions. The contractor participated in the meeting and described the potential of the veterinary school at University of California at Davis as a necropsy site. The participants concluded that the necropsy program had provided valuable data concerning the causes of sea otter mortality and the incidence and prevalence of infectious diseases. They concluded that not only should the program be continued, but also that effort should be made to expand the database to improve information about the causes of mortality.

Acquiring Data on Sea Otters from Russia (Glenn R. VanBlaricom, Ph.D., University of Washington, Seattle, WA)

Russian explorers discovered and, in the 1700s, began commercial hunting of sea otters, fur seals, and other marine mammals along the west coast of North America. In some cases, careful records were kept of when, where, and how many animals were taken. With the dissolution of the former Soviet Union and subsequent economic and social chaos, much of the data are in jeopardy of being lost. This contract provided funds for the contractor to consult with Russian scientists and visit scientific and historical archives in Petropavlovsk-Kamchatskiy, Moscow, and St. Petersburg, Russia, to locate, access, and determine what might be done to preserve data concerning sea otters taken in the 18th and 19th centuries. A large body of data on sea otter harvest was located, reviewed, duplicated, and brought to the United States. Data are most complete for harvests in the Aleutian and Commander Islands. Some data from other Alaska locations also were compiled and reviewed. The data are currently being analyzed to try to reconstruct sea otter distribution and abundance in the 18th and 19th centuries.

MEETINGS AND WORKSHOPS

Improving the IWC Database (International Whaling Commission, Cambridge, England)

Soviet Antarctic pelagic whaling records, previously kept secret by Soviet authorities, recently were made public. The revelations indicated that catches of whales by Soviet whaling ships since World War II were greatly under-reported. Consequently, both past and present estimates of the size and productivity of exploited whale stocks may be substantially biased. The IWC is undertaking a program to acquire the Soviet whaling data and reassess previous estimates of stock size and productivity. The purpose of this contract, supported cooperatively by the Commission and the Department of State, was to help the IWC acquire the Soviet whaling data and to enable four Russian scientists who had worked on Soviet factory ships in the Antarctic to attend the 1994 meeting of

the IWC's Scientific Committee to explain and help evaluate the data.

Possible Illegal Trade in Whale Meat
(C. Scott Baker, Ph.D., University of Auckland, Auckland, New Zealand)

In 1993 the contractor conducted genetic analyses of samples of whale meat purchased in retail markets in Japan and found evidence that some of the meat was from species protected under the International Whaling Commission's moratorium on commercial whaling. The source of the meat could not be determined. The purpose of this contract was to enable the contractor to make known and discuss his findings during the 1994 meeting of the IWC's Scientific Committee. Based in part on the information provided, the IWC adopted a resolution at its 1994 meeting calling on member nations to strictly comply with their obligations to prohibit illegal trade under the International Whaling Convention and the Convention on International Trade in Endangered Species of Wild Fauna and Flora. The results of the contractor's studies were published in the 9 September 1994 issue of *Science*.

Involvement of Alaska Natives in International Affairs Regarding the Arctic
(Inuit Circumpolar Conference, Anchorage, Alaska)

As discussed in Chapter VI, the eight Arctic countries have developed and begun implementing the Arctic Environmental Protection Strategy. Also as discussed in Chapter VI, the Alaska Regional Director of the Fish and Wildlife Service and the Deputy Director of Biological Natural Resources of the Russian Federation initiated steps in 1992 to develop an agreement to cooperatively manage the Bering and Chukchi Seas polar bear population shared by the United States and Russia. Because these activities will affect the welfare of Alaska Natives, either positively or negatively, and because Alaska Natives possess unique knowledge gained over centuries that can help identify threats and measures needed to protect Arctic flora, fauna, and their habitats, participation of indigenous people in all meetings on these issues was critical. In cooperation with the Department of State, the Commission provided funds to the Inuit Circumpolar Conference to enable representatives of Alaska Native communities to prepare for and participate in international meetings to negotiate the U.S./Russian polar bear agreement and to give effect to the Arctic Environmental Protection Strategy. The latter included a seminar on indigenous knowledge, a meeting of the Conservation of Arctic Flora and Fauna Working Group, a meeting of the Task Force on Sustainable Development, and a meeting of the Arctic Monitoring and Assessment Program Working Group.

Bycatch Reduction Workshop
(Fisheries Management Foundation, Seattle, Washington)

The incidental bycatch of marine mammals, sea turtles, seabirds, and non-target fish species in certain commercial fisheries has serious socioeconomic as well as biological and ecological implications. For example, removing and repairing damage to fishing gear caused by non-target species cost time and money. Further, if bycatch causes or contributes to depletion of non-target species, catch limits, area and seasonal fishery closures, or other measures may be required to reduce the catch. With partial support from the Commission, the contractor is organizing and convening a workshop involving representatives of the commercial fishing industry, academia, and government agencies to explore approaches to avoiding or reducing fisheries bycatch. The Commission and other sponsors will review the findings of a workshop, to be held in September 1995, to identify possible follow-up activities.

Wildlife Ethics Workshop
(International Wildlife Film Festival, Missoula, Montana)

Amateur and professional wildlife filmmakers and photographers who use helicopters, boats, tundra buggies, and other vehicles to locate, approach, and photograph wildlife may seriously affect the behavior and habitats of the animals they photograph. To address this and other issues, organizers of the 17th Annual International Wildlife Film Festival held a workshop on ethics of wildlife photography and filmmaking. This contract provided partial support for a panel discussion of steps needed to increase awareness and minimize the possible adverse affects of wildlife

photography and to encourage factual reporting in wildlife films. The workshop was held on 2-9 April 1994 in Missoula, Montana.

REVIEWS AND ANALYSES

Analysis of International Fisheries Agreements (Michael L. Weber and Frances Spivy-Weber, Washington, D.C.)

Fisheries and ecosystem conservation efforts throughout the world have often been crippled by international agreements that do not reflect biologically, ecologically, sociologically, or economically sound management concepts and practices. This contractor is analyzing representative international agreements to identify provisions that may have caused the agreements to be ineffective and to recommend standardized approaches that would increase the probability of ecologically sound agreements being developed in the future. The draft report was sent in December 1994 to experienced fishery scientists, ecologists, managers, negotiators, and others for review. The final report, expected to be completed early in 1995, will be provided to the Department of State, the National Marine Fisheries Service, international fisheries organizations, and others interested in improving the effectiveness of conservation agreements (see Chapter III for a more detailed description of this project).

Predation of Steelhead Trout by California Sea Lions (Mark A. Fraker, Ph.D., Sidney, British Columbia, Canada)

As described in Chapter V, increasing numbers of California sea lions have learned that steelhead trout congregate seasonally and can be caught easily at the entrance to the Ballard Locks in Seattle, Washington. This predation, in combination with other sources of mortality and habitat degradation, appears to have contributed to the decline and to be impairing the recovery of the affected steelhead population. The purpose of this contract was to obtain a thorough and objective analysis of the situation and identify steps that have been and possibly could be taken to facilitate the recovery of the steelhead population. The contractor's report (see Appendix B, Fraker 1994) was provided to and used by the Pinniped-Fisheries Interaction Task Force convened by the National Marine Fisheries Service, as described in Chapter V, to assess and recommend measures for protecting and rebuilding the affected steelhead trout population.

Reviews of Marine Mammal Stock Assessment Reports (John J. Brueggeman, Parametrix, Inc., Kirkland, Washington; John Calambokidis, Cascadia Research Collective, Olympia, Washington; David M. Lavigne, Ph.D., University of Guelph, Guelph, Ontario, Canada; Burney J. Le Boeuf, Ph.D., Santa Cruz, California; Craig O. Matkin, North Gulf Oceanic Society, Homer, Alaska; Randall R. Reeves, Ph.D., Okapi Wildlife Associates, Hudson, Quebec, Canada; Donald B. Siniff, Ph.D., University of Minnesota, St. Paul, Minnesota; Mari A. Smultea, Foster Wheeler Environmental Corporation, Bellevue, Washington; Ian Stirling, Ph.D., Edmonton, Alberta, Canada; Brent S. Stewart, Ph.D., Hubbs/Sea World Research Institute, San Diego, California; and Graham A.J. Worthy, Ph.D., Texas A&M University, Galveston, Texas)

As discussed in Chapter II and Chapter V, the 1994 amendments to the Marine Mammal Protection Act require the Secretaries of Commerce and Interior to prepare draft stock assessments for each marine mammal stock in waters under U.S. jurisdiction. Each assessment is to describe the stock's geographic range; provide a minimum population estimate; characterize the status and trends; estimate the annual human-caused mortality; and identify other factors that may be causing a decline or impeding recovery; describe commercial fisheries that may be causing mortality; and estimate the potential biological removal level. The National Marine Fisheries Service and the Fish and Wildlife Service prepared draft assessment reports and made them available for public comment in August 1994. The reviews were considered and consolidated into the Commission's comments to the Services, provided in letters dated 1 and 12 December 1994. The cost of these reviews was met by a transfer of funds from the National Marine Fisheries Service to the Commission.

Analysis of Sea Otter-Fisheries Conflicts in Washington (Leah R. Gerber, Seattle, WA)

Sea otters were eliminated from much of their historic range along the west coast of North America by commercial hunting in the 1700s and 1800s. In 1969 and 1970, 59 sea otters were transported from Amchitka Island, Alaska, and released off the coast of Washington to re-establish sea otters in the area. The sea otter population occupies a small, largely wilderness area along the Olympic Peninsula and now numbers about 400 individuals. If the population continues to grow, it will recolonize areas where it may affect and be affected by fisheries and other activities that have been developed in its absence. The purpose of this contract is to determine when and where conflicts are likely to occur and how they might be avoided. The contractor's report, to be completed early in 1995, is expected to provide a basis for anticipating, monitoring, and mitigating conflicts involving sea otters and fisheries in Washington.

Communication of Information concerning Conservation of Manatees and Dugongs (Daryl P. Domning, Ph.D., Silver Spring, Maryland)

Most species and populations of manatees and dugongs (known collectively as sirenians) are threatened or in danger of extinction. To facilitate exchange of information concerning research and management actions in different areas, the contractor compiles and periodically summarizes such information in a newsletter published by the Sirenia Specialist Group of IUCN—The World Conservation Union's Species Survival Commission. The newsletter, *Sirenews*, is distributed worldwide to scientists and wildlife managers to help them make use of up-to-date information to protect populations under their control. This contract provided funds for printing and mailing four issues of the newsletter (see Appendix C, Domning 1984-present).

General Bibliography on Marine Mammals (Heather Copeland, University of Guelph, Guelph, Ontario, Canada)

The Marine Mammal Commission receives numerous requests for information concerning the biology and conservation of marine mammals. To help respond to these requests, the Commission is developing a general bibliography with references on such things as the natural history of specific marine mammals, whaling, marine mammal-fisheries interactions, strandings, animal husbandry, and marine debris. The contractor critically reviewed the section of the bibliography on contaminants and animal husbandry and provided numerous additional references. The bibliography will be completed in mid-1995.

Report on Feeding Gray Whales in the Russian Chukchi Sea (Theodore G. Chapin and James R. Gilbert, Ph.D., University of Maine, Orono, Maine)

Large numbers of feeding gray whales were seen during joint U.S.-Russian surveys of walruses done in the western Chukchi Sea in July 1989. Although gray whale sighting data were collected, they were not relevant to the survey objectives and were not analyzed or reported. The contractors analyzed and prepared a report on the survey results. The report, completed in November 1994, estimated that the observed feeding aggregation represented as much as 20 percent of the entire gray whale population. The Commission provided the report to the Minerals Management Service with its 2 December 1994 letter commenting on the proposed joint leasing by the U.S. and Russian Federation of areas in the Chukchi Sea for oil and gas exploration and development. The Commission noted that there appeared to be important gray whale feeding areas in both the eastern and western Chukchi Sea and that assessments of the proposed actions should consider this. Additional discussion of this matter is provided in Chapter X.

FIELD STUDIES

Environmental Education and Tourist Site Inventory in Antarctica
(Ronald S. Naveen, Oceanites, Cooksville, Maryland)

In 1991 the Antarctic Treaty Consultative Parties adopted a Protocol on Environmental Protection to the Antarctic Treaty. The Protocol includes provisions for protecting native flora and fauna, including seals and whales. It also includes provisions for protecting areas of special biological, ecological, scientific, historic, and aesthetic significance. The provisions of the Protocol apply to both governmental and non-governmental activities, including tourism and adventure travel. The purposes of this contract, supported cooperatively by the Commission and the Department of State, were to (1) develop and seek agreement on a proposal to incorporate the provisions of the Protocol applying to non-governmental activities in the "Guidance for Visitors to the Antarctic," adopted by the Antarctic Treaty Consultative Parties in 1975; and (2) develop and field-test procedures for ensuring that visitors and those organizing or guiding tours to Antarctica are aware of and comply with the updated guidelines. As noted in Chapter VI, the contractor's proposal provided the basis for agreement at the 1994 Antarctic Treaty Consultative Meeting on guidelines for visitors and those organizing or guiding tours to Antarctica. During the 1994/1995 austral summer, the contractor will conduct a field study to determine whether visitors to Antarctica are being made aware of and are complying with the guidelines and, if not, how this information might better be conveyed.

GENERAL

Preparation of a Career Guide in Marine Mammal Science
(The Society for Marine Mammalogy)

Federal agencies, academic institutions, and conservation organizations involved in the study, conservation, and management of marine mammals receive frequent inquiries from students about pursuing careers in the study of marine mammals. To help respond to these inquiries, the Society for Marine Mammalogy wrote and published a guide entitled "Strategies for Pursuing a Career in Marine Mammal Science." The Commission provided partial support for preparing, printing, and distributing the guide, which is available from Allen Press, P.O. Box 1897, Lawrence, Kansas 66044-8897.

Maintenance of the Remington Kellogg Library
(Irina A. Koretsky, Falls Church, Virginia)

The Smithsonian Institution's Remington Kellogg Library is one of the nation's largest repositories of marine mammal literature. The library is used by scholars, researchers, and students, particularly those searching for historical, unique, or difficult-to-find documents. Because the library does not have a full-time librarian, the Commission has paid for the contractor to integrate the backlog of reprints into the library, to update and integrate the library's holdings from the former Soviet Union, and to catalog new reprints, thereby maintaining the Remington Kellogg collection in a usable form.

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

The Marine Mammal Protection Act requires the Marine Mammal Commission to conduct a continuing review of marine mammal research conducted or supported by Federal agencies. A report on research conducted in fiscal year 1994 and planned to be conducted in fiscal year 1995 will be completed in the spring of 1995. It will be provided to the responding agencies and available to other interested persons and organizations through the National Technical Information Service (see Appendix B, Waring 1981 to 1994, for reports from previous years).

Data Acquisition and Management

Many different Federal, state, and local government agencies and private institutions collect, maintain, and use population, environmental, and other data bearing on the conservation of marine mammals and their habitats. In many cases, the various groups

are unaware of the data being collected and stored by others, and how those data can be accessed.

Recent advances in computer technology, particularly computer-based geographic information systems, provide means for storing, transferring, integrating, analyzing, and displaying data from multiple sources. As described below, the Marine Mammal Commission has initiated and participated in a number of efforts to improve access to and use of data bearing upon the conservation of marine mammals and their habitats.

Manatees

In 1989 the Commission co-sponsored a workshop to (1) determine how geographic information systems might help identify measures necessary to conserve manatees and their habitats in Florida and Georgia, and (2) identify and facilitate cooperative actions that might be taken by Federal and state agencies, academic institutions, and other interested groups to develop an effective geographic information system for manatees. Workshop participants concluded that a geographic information system should be created and that it should consist of a centralized database with substantial flexibility and analytical capabilities and a network of field terminals located throughout Florida and Georgia. They also concluded that a Manatee Geographic Information System Coordinating Team should be formed to devise an operational plan for developing and maintaining databases. The team was formed with members from the Florida Department of Environmental Protection, the National Biological Service, the Fish and Wildlife Service, and the Marine Mammal Commission. Its activities include developing databases, determining the best formats for presenting data to the public, data analysis, considering the legal status of data residing in the manatee geographic information system, and resolving ethical questions concerning data use and access. The team also formed a Manatee Geographic Information System Working Group to help individuals gain access to expertise and discuss data-sharing issues.

Alaska

In December 1990 the Marine Mammal Commission and the National Marine Fisheries Service co-sponsored a workshop to identify and determine how best to resolve critical uncertainties concerning the cause of marine mammal and seabird population declines in the Bering Sea. Workshop participants noted that a number of State and Federal agencies and private institutions were collecting and archiving data bearing on the question and that the data often could not be located or accessed readily. Following the workshop, the Commission contracted for a study to inventory existing databases and determine whether data being collected by various organizations might be made more accessible by developing a common or coordinated geographic information system. The contractor concluded that the data could be made more useful by creating a directory of available data and data sources and developing a common or integrated system to compile, exchange, and analyze relevant data. The contractor recommended that a meeting of experts be held to determine how best to achieve these objectives (see Appendix B, Hoover-Miller 1992).

To follow up on the contractor's recommendations, the Commission provided funds in 1993 to organize and hold a workshop to (1) further describe the types of marine mammal and related data being collected and maintained by various organizations and how those data can be accessed; (2) evaluate the Arctic Environmental Data Directory to see if it adequately identifies the nature of, and ways to access, existing data sets; (3) disseminate information on geographic information system software and hardware currently being used and discuss plans to expand or otherwise change existing systems; (4) determine whether a central geographic information system should be developed; and (5) identify other actions needed to improve accessibility to and use of existing data.

The workshop, held in Anchorage on 5-7 April 1994, was attended by representatives of the Alaska Department of Fish and Game, the Alaska Department of Natural Resources, the Alaska Natural Heritage Program, the Florida Marine Research Institute, the U.S. Fish and Wildlife Service, the Minerals Management Service, the National Marine Fisheries Service, the U.S. Geological Survey, the Marine Mammal Commission, and various academic institutions. Among other things, participants (1) identified and described geographic information systems that currently are being used or developed by state and Federal

agencies and academic institutions conducting research related to marine mammals in Alaska; (2) decided that the existing Arctic Environmental Data Directory is useful and should be supported by multi-agency funding; (3) concluded that commonly accepted base maps of the Alaska coastline and offshore bathymetry were needed; and (4) decided that, while a centralized system was not needed, communication among the various groups using geographic information systems needs to be improved. At the end of 1994 the contractor's draft report was being reviewed by the Commission; a final report is expected early in 1995.

As a result of the workshop, the Alaska Marine Resources Information Network was formed. It is a volunteer organization, made up of people from Federal agencies, state governments, and the private sector, to facilitate communication about data per taining to Alaska marine ecosystems and improve access to those data sets. The organization, housed at the University of Alaska's School of Fisheries and Ocean Sciences in Fairbanks, plans to publish and distribute a newsletter regularly. The first issue was published in November 1994.

Federal Geographic Data Committee

In October 1990 the Office of Management and Budget established the Federal Geographic Data Committee to promote the coordinated development, use, sharing, and dissemination of data with geographic attributes. The committee, chaired by the Secretary of the Interior, and its various subcommittees provide policy guidance for agency efforts to establish protocols and standards for the content, quality, and transfer of geographic data. On a related matter, the President issued an Executive Order on 13 April 1994 that directs all Federal agencies to contribute to development of a National Spatial Data Infrastructure (*i.e.*, an electronic network of geospatial data producers, managers, and users) and requires that the Federal Geographic Data Committee standardize means of data collection, standardize metadata (information describing the content, quality, condition, history and other characteristics of data), provide standardized documentation of previously collected geospatial data, and assist in making data held by Federal agencies available to the public.

The Federal Geographic Data Committee is divided into 11 subcommittees with responsibilities for different types of data. The Subcommittee on Bathymetric Data, on which a member of the Marine Mammal Commission staff serves, is responsible for considering and providing advice on marine-related data. In 1994 the Subcommittee (1) held two meetings of representatives of industry, local governments, and other interested organizations to learn from private sector users ways to make marine bathymetric data more accessible and to educate the general marine and coastal mapping community about the Federal Geographic Data Committee and the National Spatial Data Infrastructure; (2) developed standards for bathymetric data and metadata to ensure compatibility and consistency when collecting and transferring bathymetric and other geospatial data; (3) worked on implementation of the Federal Geographic Data Committee metadata standard and made prototype metadata files available on the Internet; (4) coordinated the collection of shoreline data and assured the quality of those data; and (5) reviewed standards being developed by other subcommittees.

Believing that marine wildlife and fisheries issues would receive little attention in the Bathymetric Subcommittee, the Marine Mammal Commission wrote on 25 July 1994 to the National Oceanic and Atmospheric Administration's Deputy Undersecretary for Oceans and Atmosphere, suggesting that the Federal Geographic Data Committee establish a Subcommittee on Marine Resources. In responding on 4 October 1994 the Deputy Undersecretary indicated that the idea of a marine resource subcommittee had been discussed at the most recent meetings of the Federal Geographic Data Committee's Subcommittees on Coordination and Bathymetric Data and the consensus view was that marine resources are clearly an important issue. The letter further noted that the chair of the Bathymetric Subcommittee would contact the Commission about co-convening a meeting of organizations interested in marine resource data to determine the issues that might be dealt with by the proposed subcommittee; identify a group or agency willing to assume responsibility for this activity; list agencies having an interest in marine resource issues; and recommend to the Federal Geographic Data Committee an appropriate course of action. At the end of 1994 the Commission awaited further action.

Chapter XII

PERMITS FOR MARINE MAMMAL RESEARCH, PUBLIC DISPLAY, AND ENHANCEMENT

The Marine Mammal Protection Act places a moratorium, with certain exceptions, on the taking and importing of marine mammals and marine mammal products. One exception provides 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, public display, or enhancing the survival or recovery of a species or stock. As discussed in Chapter II, certain changes to the provisions of the Marine Mammal Protection Act regarding permits were enacted in 1994. Among other things, the amendments place new restrictions on the export of marine mammals to foreign facilities; streamline procedures for authorizing scientific research that does not involve capturing marine mammals and does not have the potential to injure marine mammals; expedite the issuance of scientific research permits when delay could result in injury to a marine mammal or in the loss of unique research opportunities; and establish a new permit category for commercial and educational photography. Also, as discussed in Chapter IV, a new permit category was created under which polar bear trophies from Canada could be imported.

Export of marine mammals was not addressed previously under the Marine Mammal Protection Act. Under the 1994 amendments, however, unauthorized export of a marine mammal was prohibited, and provisions were added to specify when the export of marine mammals for purposes of public display, scientific research, or species enhancement is permissible. Exports for such purposes are only allowed when the foreign facility meets standards comparable to the requirements that must be met by facilities in the United States with respect to education and conservation programs, Animal and Plant Health Inspection Service licensure, and public accessibility. Further discussion of the comparability requirement pertaining to Animal and Plant Health Inspection Service licensure is provided in Chapter XIII.

The Act was amended to establish a streamlined procedure for authorizing research that involves taking only by Level B harassment — *i.e.*, any act of pursuit, torment, or annoyance that has the potential to disturb but not injure a marine mammal or marine mammal stock. The amendment required the National Marine Fisheries Service and the Fish and Wildlife Service, within 120 days of enactment of the new provision, to publish regulations implementing this new "general authorization." The National Marine Fisheries Service on 3 October 1994 published an interim final rule implementing the new provision. The Fish and Wildlife Service has yet to issue implementing regulations.

Researchers conducting investigations involving aerial surveys, photo-identification, and other non-invasive techniques will likely be covered under the new general authorization and are no longer required to obtain a permit. However, at least 60 days before starting their research, researchers will be required to submit a letter of intent that sets forth (1) the qualifications of the applicant, (2) the species or stocks of marine mammals that may be harassed, (3) the geographic location(s) of the research, (4) the period of time during which the research will be conducted, (5) the purpose of the research, including an explanation of why the research is believed to be *bona fide*, and (6) the methods to be used to conduct the research. A new statutory definition states that *bona fide* scientific research is that which would (1) likely be accepted for publication in a refereed scientific journal; (2) is likely to contribute to the basic knowledge of marine mammal biology or ecology; or (3) is likely to identify, evaluate, or resolve conservation problems.

Within 30 days of receiving a letter of intent, the Secretary is required to write to the applicant confirming that the general authorization applies or, if the Secretary believes that the research is likely to result in taking other than by Level B harassment, that a permit must be obtained. Research that involves the capture of marine mammals or that has the potential to injure marine mammals will remain subject to the permitting requirements.

By letter of 1 December 1994 to the National Marine Fisheries Service, the Commission provided comments on the interim final rule implementing the general authorization. In its letter, the Commission identified several areas in which the regulations deviate from the statutory requirements and need to be clarified. The Commission noted that, while the interim rule contains no indication of how the Service coordinated its efforts with the Fish and Wildlife Service, the two agencies should adopt consistent, if not identical, implementing regulations, perhaps by adopting joint regulations.

The interim rule is expected to be replaced by a final rule in 1995. The Fish and Wildlife Service and the National Marine Fisheries Service are working toward publishing a joint final rule. It is expected that implementation of the general authorization for certain types of research will alleviate the delay experienced by some researchers in obtaining permits. Other researchers, however, will have to work within the previously established permit system. As discussed below, the National Marine Fisheries Service is now revising its permit regulations to make the process for obtaining permits operate more consistently and smoothly.

In response to concerns from many researchers that the process for issuing scientific research permits was unnecessarily restrictive in all instances, greater flexibility was provided by allowing the Secretary to issue permits before the end of the required 30-day public review and comment period when such delay could result in injury to a species, stock, or individual animal or in the loss of unique research opportunities.

During the 1994 reauthorization, it was noted that commercial and educational photography did not fit under any of the existing permit categories and, as a result, was sometimes carried out pursuant to a scientific research permit. In response, the Act was amended to create a new permitting authority for photography for commercial and educational purposes. This authority has yet to be implemented. A proposed rule is expected early in 1995.

Permit Application Review

Whether for a scientific research, public display, or species enhancement permit, the application review process involves the same four stages: (1) receipt and initial review of the application by either the Department of Commerce or the Department of the Interior; (2) publication in the *Federal Register* of a notice of the application, inviting public review and comment, and transmittal to the Marine Mammal Commission; (3) review of the application by the Commission, in consultation with its Committee of Scientific Advisors, and transmittal of its recommendation to the Department; and (4) final Departmental action on the application, including consideration of comments and recommendations made by the Commission, the public, and, if captive maintenance of animals is involved, the Animal and Plant Health Inspection Service, on the adequacy of facilities and transportation. Figure 5 on the following page shows this process.

Once a permit has been issued, it can be modified by the responsible agency, provided the proposed modification meets statutory and regulatory requirements. In most cases, a modification is subject to the same notice, review, and comment procedures as a permit application. For the Commission's purposes, a modification includes the following: a request to amend an existing permit, a request for authorization to continue, and/or a request for extension.

The total review time for a permit (from initial receipt of an application at the Service until final departmental action) depends on many factors, including the sufficiency of the information provided by the applicant, any special requirements that must be satisfied before the application can be processed, and the efficiency of the review process in the agencies.

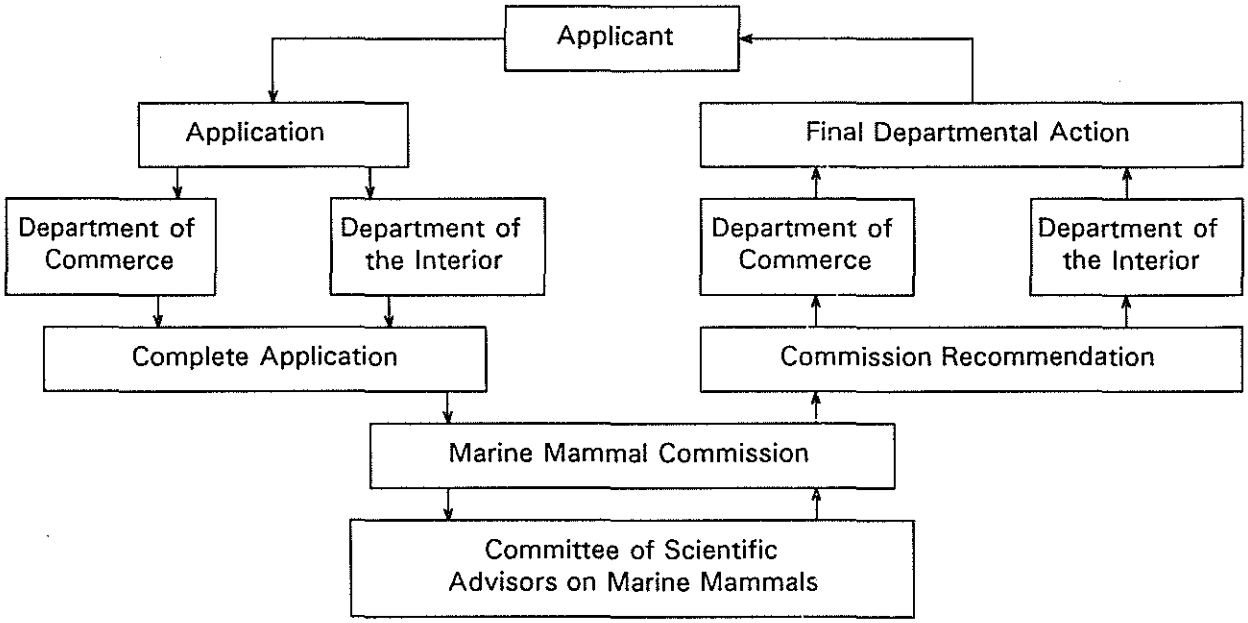

Figure 5. Process by which permit applications to take marine mammals are reviewed

During 1994 the Commission, in consultation with its Committee of Scientific Advisors, made recommendations on 35 permit applications submitted to the Department of Commerce and 9 applications submitted to the Department of the Interior. Of these, four awaited final action by the Department of Commerce and five awaited final action by the Department of the Interior at the end of 1994. The Commission's average review time for the 40 applications upon which it commented in 1994 was 26 days. The Commission also made recommendations on 59 requests to modify permits in 1994. The average time required for Commission review of these requests was 20 days.

The Department of Commerce took final action on 31 permit applications during 1994, including 6 applications that were received in 1993. The average processing time, from the date the application was received by the Department until final action was taken, was 122 days. The Department of the Interior took final action on 4 permit applications during 1994. The average processing time, from the date the application was received by the Department of the Interior until final action was taken, was 95 days. If calculated from the date the Department considered an application to be complete, the average processing times for the Departments of Commerce and the Interior were 103 and 78 days, respectively, compared to 103 and 93 days in 1993.

Review of Scientific Research Permit System

The Marine Mammal Protection Act authorizes permits to be issued for purposes of scientific research, public display, or enhancing the survival and recovery of marine mammal species or stocks, and, as mentioned previously, has been amended to include other purposes. Scientists have, often with justification, expressed concern about the amount of time it takes to obtain a permit, the reporting requirements, and other terms and conditions included in those permits. On the other hand, applicants often do not submit sufficient information to enable the responsible Federal agencies to review the proposed research project and to make the findings required by the Act.

As discussed in previous annual reports, three meetings were held in 1992 to review problems associated with humpback and killer whale scientific research permits. These meetings were convened to

explain the permit process and the statutory requirements for permits more completely to the research community. In addition, a panel was established by the National Marine Fisheries Service to review and comment on these permits, paying particular attention to whether the proposed research was *bona fide*, not duplicative of other research, and humane.

In light of persistent problems with the review and issuance of scientific research permits, the Marine Mammal Commission convened a workshop of invited scientists and representatives of the National Marine Fisheries Service and the Fish and Wildlife Service on 19-20 July 1993. Workshop participants looked at the general aspects of the permit system and how it might be streamlined. Participants discussed the need for simpler, clearer instructions to applicants and drafted revised instructions for consideration by the Services.

The Marine Mammal Commission sponsored a second workshop on 20-21 September 1993 to determine how best to overcome permit problems related to defining what constitutes a "take" as it relates to certain types of research. The participants concluded that photo-identification and similar studies conducted by experienced researchers are unlikely to affect individual marine mammals or their populations. The 1994 amendments enable researchers conducting studies involving aerial surveys, photo-identification, and other non-invasive techniques to be covered under the new general authorization. They are no longer required to obtain a permit.

A draft paper describing the scientific research system was circulated for review to participants of both workshops late in 1993. In November 1994 the document was redrafted to take into account the 1994 amendments to the Marine Mammal Protection Act. At the end of 1994, the Commission was awaiting receipt of comments on the revised draft from some of the meeting participants. A final discussion paper is expected to be distributed early in 1995. The results of both meetings will be considered in preparing the Commission's comments on proposed revisions to applicable permit regulations expected to be published by the National Marine Fisheries Service in 1995.

In testimony before the House Subcommittee on Environment and Natural Resources of the Committee on Merchant Marine and Fisheries on 10 February 1994, the Marine Mammal Commission noted the results of the two workshops convened by the Commission in 1993 and made several recommendations as to how to address existing problems within the permit system. These actions included developing clear, concise instructions for preparing and submitting applications for scientific research permits.

In its testimony, the Commission noted that there has been some confusion regarding implementation of the requirement enacted in 1988 that only research for *bona fide* scientific purposes be authorized. While the National Marine Fisheries Service was trying to alleviate this problem through adoption of a regulatory definition of the term, the Commission noted that it would be useful if the Act were amended to give the term *bona fide*, as used in section 104(c)(3), its common dictionary definition, *i.e.*, that it refer to an application made in good faith without fraud or deceit, an application made with earnest intent, and a scientific purpose which is neither specious nor counterfeit.

In addition to the above, the Commission noted that activities other than research have been conducted under the authority of scientific research permits in the past such as documentary film making and commercial photography. Inasmuch as it is clear that some filming and photography of marine mammals can be done in ways not likely to harm the animals, the Commission recommended that the Act be amended to provide for taking marine mammals, including depleted species, incidental to filming for either educational or commercial purposes under certain conditions (*e.g.*, when the effect on individuals and populations clearly would be negligible).

The Commission also noted that another major problem with the existing statutory scheme for authorizing scientific research permits was the lack of any means for waiving the 30-day public notice and comment requirement. In some situations the Secretaries' inability to expedite permit issuance has delayed research necessary to detect, understand, or alleviate known or possible threats to marine mammals. In other instances, unique or unanticipated research opportunities have been lost because a permit could not be issued quickly enough. The Commission recommended amending the Act to authorize issuance

of permits before the end of the 30-day public comment period when delaying initiation of research could result in harm to a species, population, or an individual marine mammal, or result in the loss of unique research opportunities that could not reasonably have been foreseen.

Congress addressed several of the concerns raised by the Commission. In this regard, Congress amended the Marine Mammal Protection Act to (1) establish a streamlined procedure under the general authorization, for authorizing research that involves taking only by Level B harassment; (2) include a statutory definition of *bona fide*; (3) create a permit category for photography for commercial and educational purposes; and (4) enable the Secretaries of Commerce or the Interior to waive the 30-day comment period in some instances.

Permit Regulations

In 1988 the National Marine Fisheries Service initiated a review of its permit program with a goal of revising its permit regulations. The Service published 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," and held public meetings to solicit comments on the regulations. By letter of 24 August 1989 the Commission provided extensive comments on the discussion paper. A proposed rule was published by the Service on 14 October 1993.

In light of the sweeping changes to the Marine Mammal Protection Act permit provisions enacted in 1994 and the 3 October 1994 publication of an interim rule to implement the general authorization for certain types of research, the National Marine Fisheries Service plans to publish revised proposed regulations early in 1995.

As with the proposed regulations published in 1993, it is expected that the revised proposal will seek to update and consolidate existing permit regulations under the Marine Mammal Protection Act, the Endangered Species Act, and the Fur Seal Act. This would be the first comprehensive revision to these regulations since the mid-1970s. In addition to the general authorization, the Service plans to incorporate changes, as called for by the 1994 amendments to the Marine Mammal Protection Act, relating to certain types of scientific research, the shift in responsibility for overseeing the care and maintenance of captive marine mammals (see below), and the statutory definition of *bona fide* scientific research. It is also expected that the revised proposed regulations will explain more clearly the applicable permit requirements and review procedures and will change certain aspects of the applicable administrative requirements and procedures.

As discussed in previous annual reports, the Commission wrote to the Fish and Wildlife Service in 1990 recommending that it work with the National Marine Fisheries Service to ensure consistent interpretation and implementation of the 1988 amendments to the Marine Mammal Protection Act and other permit requirements. The Fish and Wildlife Service informed the Commission, most recently at the Commission's 1994 annual meeting, that it intends to defer adoption of revised permit regulations until the National Marine Fisheries Service has published its revised regulations. At that time, the Fish and Wildlife Service expects to propose its own regulations. At the end of 1994, the Commission was reviewing possible ways in which the Commission, the Fish and Wildlife Service, the Animal and Plant Health Inspection Service, and the National Marine Fisheries Service could better coordinate their efforts to implement the Marine Mammal Protection Act's permit provisions. The Commission also is interested in promoting coordination between the National Marine Fisheries Service and the Fish and Wildlife Service in implementing the new general authorization for scientific research. The Commission expects to provide additional recommendations concerning agency coordination early in 1995.

Swim-with-the-Dolphin Programs

Prior to enactment of the 1994 amendments to the Marine Mammal Protection Act, four marine mammal facilities had been authorized by the National Marine Fisheries Service to conduct swim-with-the-dolphin

programs in which members of the public are allowed to enter the water and interact with captive bottlenose dolphins. These programs were authorized on a limited experimental basis while the Service collected information necessary to determine whether such programs should be authorized at other facilities and for a longer period of time.

As part of its decision-making process, and in response to considerable public controversy generated by these programs, the Service published an environmental impact statement in April 1990. The preferred alternative set forth in the impact statement was to continue the four existing swim-with-the-dolphin programs on an experimental basis while a one-year study on the effects of the programs was conducted. The four permits were subsequently extended until 31 December 1991, and a workshop was convened to develop a protocol for a study of the relative risks and benefits of such programs.

In June 1992 the National Marine Fisheries Service contracted for a comparative study of programs at the four facilities authorized to operate experimental swim-with-the-dolphin programs. An experienced ethologist was placed in charge of the study and two people were hired to conduct observations of the four existing swim programs. To enable the existing programs to continue on an experimental basis during the study, the four existing permits were extended first until 30 June 1993 and then until 30 June 1994.

In November 1992 a participant in one of the swim programs suffered a fractured sternum when he was butted several times by a dolphin. In addition, aggressive behavior on the part of dolphins in another swim program was reported. These incidents renewed concerns regarding the safety of these programs.

On 7 January 1993 the Commission recommended that the National Marine Fisheries Service immediately review the swim programs and analyze their safety in light of reported and unreported accidents. It also recommended that the Service review the provisions and wording of the existing permits and determine whether the programs are meeting the reporting requirements of their permits. In response, the National Marine Fisheries Service assured the Commission that it was investigating all reported incidents, had initiated a behavioral study of dolphins participating in swim programs, and was reviewing all conditions of permits authorizing swim-with-the-dolphin programs.

On 21 June 1993 the Commission wrote to the Service asking for a status report on the Service's investigation of alleged problems at swim-with-the-dolphin facilities and on steps taken by the Service to resolve any such problems. The Service responded on 15 July 1993, noting that, in light of recent problems with some facilities meeting the applicable permit conditions, the permits had been modified to clarify the requirements.

The results of the comparative study of swim-with-the-dolphin programs contracted by the National Marine Fisheries Service were published in August 1994 (*Quantitative Behavioral Study of Bottlenose Dolphins in Swim-with-the-dolphin Programs in the United States*, Samuels and Spradlin, 1994). The researchers concluded that both dolphins and swimmers are at risk in certain types of programs and indicated that, to ensure the safety of both, the actions of swimmers and dolphins must be controlled directly by professional animal trainers.

As a consequence of the 1994 amendments to the Marine Mammal Protection Act, the National Marine Fisheries Service no longer has authority to regulate or otherwise control swim-with-the-dolphin programs. The Animal and Plant Health Inspection Service has assumed responsibility for the programs under the Animal Welfare Act, and intends to publish interim regulations early in 1995 taking into account previously applicable permit conditions imposed by the National Marine Fisheries Service, information from a workshop on veterinary care of dolphins involved in swim programs, and a study of swim-with-the-dolphin programs recently completed under contract to the Fisheries Service.

As discussed in the previous annual report, Mirage Resorts filed suit on 1 September 1992 in the U.S. District Court for the District of Nevada challenging a decision by the National Marine Fisheries Service not to authorize a swim-with-the-dolphin program at that facility (*Mirage Resorts* v. *Franklin*). The court issued a ruling in favor of Mirage on 24 November

1993. The court identified the fundamental issue of the case as whether the National Marine Fisheries Service has jurisdiction under the Marine Mammal Protection Act over captive dolphins, captive-born dolphins, and the progeny of wild dolphins captured before the Act's 21 December 1972 effective date. If the Service has such jurisdiction, the court reasoned, then it may properly regulate swim-with-the-dolphin programs such as that proposed by Mirage. The court found, however, that the Service lacked continuing authority over previously captured dolphins.

The court concluded that Congress, in enacting the Marine Mammal Protection Act, intended the Act "only to apply to marine mammals in the wild." Consistent with this interpretation, the court ruled that the Service lacks authority to regulate swim-with-the-dolphin programs, "as such programs do not involve a 'taking' of the marine mammals from their natural habitat in the wild." The court suggested that jurisdiction over swim-with-the dolphin and other programs involving captive marine mammals properly rested with the Animal and Plant Health Inspection Service under the authority of the Animal Welfare Act.

Because the court had not specifically addressed the applicability of the statutory provision authorizing the Service to condition permits by specifying "the methods of capture, supervision, care, and transportation which must be observed pursuant to and after [the] taking or importation," and because of other problems with the court's ruling, the Federal defendants filed a notice of appeal on 10 February 1994.

Before the appellate court could consider the matter, amendments to the Marine Mammal Protection Act were enacted. As discussed in Chapter II, the amendments, among other things, addressed the scope of the Service's jurisdiction over captive marine mammals. Specifically, the amendments make it clear that the National Marine Fisheries Service has no authority to regulate the use of dolphins (or other marine mammals) in swim programs.

In light of the amendments, the Federal defendants filed a motion to dismiss its appeal and seeking to have the case remanded to the district court to vacate the judgment and dismiss the action as moot. While the court of appeals dismissed the appeal and instructed the district court to dismiss the action as moot, it did not instruct the district court to vacate its judgment. On 7 July 1994 the district court dismissed the case as moot.

Subsequently, defendants sought to have the dismissal order amended to vacate the district court's 24 November 1993 ruling in the case. The motion was denied, leaving the adverse ruling in place.

Feeding Wild Marine Mammals

In 1988 the Commission became aware that certain operators of commercial dolphin-watching trips in the Gulf of Mexico were feeding dolphins as part of their tours. The Commission referred this matter to the National Marine Fisheries Service, noting that feeding wild dolphins could adversely affect the dolphins and was contrary to the provisions of the Marine Mammal Protection Act.

In 1989, recognizing that dolphin-feeding may constitute a "take" under the Marine Mammal Protection Act, one operator requested a public display permit seeking authority to approach, observe, and feed wild bottlenose dolphins in the Corpus Christi (Texas) Ship Canal. After a thorough review of the issue, the Commission concluded that wild dolphin-feeding programs, even those conducted with the utmost care and best of intentions, could adversely affect the dolphins. By letter of 21 December 1989 the Commission recommended that the permit be denied. Among the considerations that led to its conclusion were that feeding programs may (1) cause dolphins to be attracted to fishing boats and other vessels, increasing the likelihood that they will become entangled in fishing gear, be struck by vessels, or be shot, poisoned, or fed foreign objects; (2) cause animals to become dependent on such food sources and become less able to find and catch natural prey when feeding is discontinued; (3) alter migratory patterns, thereby subjecting animals to food shortages or inhospitable conditions that they otherwise would avoid; (4) condition animals to expect food from people, causing aggressive behavior when food is not

offered; and (5) expose animals to and make them more susceptible to disease.

Consistent with Commission recommendations, the Service denied the permit. In addition, on 29 August 1990 the Service published a policy statement in the *Federal Register* advising that it would no longer accept or review public display permit applications for authorization to feed marine mammals in the wild.

On 20 March 1991 the Service issued a rule amending its regulatory definition of the term "take" to include feeding or attempting to feed marine mammals in the wild. As promulgated, the rule applies to feeding all wild marine mammals under the jurisdiction of the National Marine Fisheries Service, not just dolphins. "Feeding," as defined in the rule means "offering, giving or attempting to give food or non-food items to marine mammals in the wild... including operating a vessel or providing other platforms from which feeding is conducted or supported." It does not include the routine discard of bycatch during fishing operations or the otherwise legal, routine discharge of waste or fish by-products from fish processing plants or vessels.

On 19 April 1991, the date the new regulatory definition of the term "take" was to become effective, a tour operator who had sought authority to conduct a dolphin-feeding program under a scientific research permit filed suit in the U.S. District Court for the Southern District of Texas (*Strong* v. *United States*), seeking either to invalidate the new regulation or to compel issuance of a permit.

The district court issued a temporary restraining order on 19 April 1991, enjoining enforcement of the feeding ban as it pertained to the plaintiffs and on 1 October 1992 ruled in the plaintiffs' favor, enjoining enforcement of the marine mammal feeding regulation as it pertained to dolphins. The court found that the regulatory definition of taking adopted by the Service was inconsistent with the statutory definition of that term. The court determined that "Congress intended a taking to be a reduction to possession or an annoyance sufficiently disturbing to cause flight from concern for self-preservation." In the court's view, "the term 'harass' would not in its ordinary sense include the mere feeding of animals in the wild."

The court further determined that the administrative record of the Service's rulemaking did not adequately support the conclusion that wild dolphins would be adversely affected if fed by humans. The court found that the record contained no scientific studies to justify the Service's conclusion. Rather, the Service "chose to support its regulation with theories of possible harm to dolphins based on evidence that is merely anecdotal."

On 22 December 1992 the Federal defendants filed a notice of appeal. The Fifth Circuit Court of Appeals issued its ruling on 29 October 1993, vacating the lower court's holding. The appellate court found that Congress had not spoken to the precise question of whether feeding marine mammals in the wild constitutes a take. Thus, the Service is free to adopt a regulatory interpretation of the term, provided its interpretation is "reasonable." While the district court had rejected the Service's interpretation as unreasonable, the court of appeals ruled that "'disturb' is synonymous with 'harass' and the agency has been given substantial scientific evidence that feeding wild dolphins disturbs their normal behavior and may make them less able to search for their own food." The court therefore concluded that it was "clearly reasonable [for the Service] to restrict or prohibit the feeding of dolphins as a potential hazard to them."

The court of appeals, however, concurred with the district court that the Service had improperly established a rule restricting the issuance of permits to activities in the wild without following the required rulemaking procedures. As discussed above, the National Marine Fisheries Service intends to publish revisions to its permit regulations in 1995. Among other things, the rule is expected to define "public display" as including only those activities carried out at facilities holding captive marine mammals. Inclusion of this provision in the Service's regulations will cure the procedural deficiency identified by the court.

The 1994 amendments to the Marine Mammal Protection Act included a statutory definition of the term "harassment." Harassment is defined as any act of pursuit, torment or annoyance that has the potential to injure marine mammals or marine mammal stock in the wild or has the potential to disturb a marine mammal or marine mammal stock in the wild by

causing disruption of behavioral patterns, including but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering. As noted above, feeding wild dolphins is likely to disrupt normal behavior, particularly feeding and migration patterns. As such, it would constitute harassment under the new definition.

Congress addressed dolphin-feeding in the National Oceanic and Atmospheric Administration Authorization Act of 1992. It directed the Secretary of Commerce, in consultation with the National Academy of Sciences and the Marine Mammal Commission, to design and conduct a study in the Eastern Gulf of Mexico on the effects of feeding wild dolphins. While it did not conduct a study on the effect of feeding programs, the National Marine Fisheries Service prepared a report based on existing documentation concerning the effects of feeding marine mammals and other wild animals. The Service submitted its *Report to Congress on Results of Feeding Wild Dolphins: 1988-1994* in July 1994. The report notes that in 1989, eleven "feed the dolphin" commercial cruise operations were known to be active off of Corpus Christi, Texas, Hilton Head Island, South Carolina, and Panama City and Key West, Florida. By 1992, the report notes, as many as 20 commercial cruise and 50 charter operations were active in the southeast region alone. The report states that dolphins in areas where feeding activities have occurred are now habituated to accepting food from humans and in fact beg for handouts from private vessels and charter boats. The report cites a variety of reports of dolphins, in areas where feeding has occurred, exhibiting "altered behaviors," *i.e.*, dolphins biting swimmers and dolphins surrounding small fishing boats.

The Service also noted reports of dolphins being fed beer, pretzels, and hooks baited with fish. In addition to the above, the report states that the Service has received reports that feeding excursions now include swimming with dolphins, during which patrons are given bags of fish to take into the water with them. In light of the apparent altered dolphin behavior, the dolphins' loss of wariness of humans, increased injuries to humans by dolphins, and the ingestion of inappropriate food, the report concludes that, while not all interactions between humans and wild animals are negative, feeding wild marine mammals is or has the potential to be harmful to both people and marine mammals.

Acoustic Thermometry of Ocean Climate Program

In January and February 1991 oceanographers from the United States and several other countries conducted an experiment to determine if underwater transmission of low-frequency sounds could be used to detect global warming. The experiment was based on the knowledge that sound travels faster in warm water than in cold water. Therefore, if travel times across ocean basins can be measured accurately, it should be possible to detect small (*e.g.*, 0.25°C) changes in average ocean temperature caused by global warming or long-term climate changes.

The experiment, referred to as the Heard Island Feasibility Test, involved lowering a portable sound generator to a depth of about 150 m in the ocean near Heard Island, south of Australia; periodically generating pulses of high-intensity, low-frequency sound (209 dB with a center frequency of 57 Hz) into the deep ocean sound channel; and attempting to determine the travel times of the sound to receiving hydrophones as far away as Alaska, California, and Bermuda.

Many species of marine mammals are known to use sound to communicate, navigate, and locate and capture prey. However, available information was insufficient to determine how these or other marine mammals might be affected by the Heard Island Feasibility Test. Therefore, the test was expanded to include a marine mammal assessment/monitoring program. The research was conducted under the authority of a scientific research permit issued by the National Marine Fisheries Service.

The high-intensity, low-frequency sounds introduced into the deep sound channel near Heard Island were detected at ranges up to 18,000 km, demonstrating the potential for using acoustic transmissions to monitor ocean temperature. The concurrent marine mammal studies indicated that there were some effects on marine mammals. The studies were insufficient, however, to determine the number of species and

individual animals affected or the extent and distances at which they were affected.

Recognizing that the success of the Heard Island test likely would lead to proposals for further experiments, the National Marine Fisheries Service, in consultation with the Office of Naval Research, held a workshop in October 1991 to determine the kinds of studies needed to adequately determine the effects of high-intensity, low-frequency sounds on marine mammals. In addition, the Office of Naval Research provided funds to the National Research Council to review current knowledge and recommend research necessary to improve basic understanding of the effects of low-frequency sounds on marine mammals. The National Research Council's Ocean Studies Board constituted a Committee on Low-Frequency Sound and Marine Mammals to undertake the study. The results of the committee's study were released in March 1994.

The committee's report, "Low-Frequency Sounds and Marine Mammals: Current Knowledge and Research Needs," concluded that available data generally are insufficient to assess the effects of intense low-frequency sounds on any marine species. Among other things, it noted the need for better information concerning the behavior of marine mammals in the wild, the auditory systems of marine mammals, and the effects of low-frequency sound on other components of the food chains of which marine mammals are a part. The report also reviewed the provisions of the Marine Mammal Protection Act governing the taking of marine mammals in the course of scientific research and concluded that the provisions were unnecessarily cumbersome and restrictive.

As noted in the Commission's previous annual report, the Defense Department's Advanced Research Project Agency provided funding in 1993 to Scripps Institution of Oceanography for a 30-month follow-up to the Heard Island experiment. This proof-of-concept study, titled the "Acoustic Thermometry of Ocean Climate (ATOC) Program," called for installing 260-watt/195-dB (re: 1 micro Pascal) low-frequency sound generators in deep water 15 km off Haena Point on the island of Kauai, Hawaii, and 40 km off Point Sur, California. Although these generators would be only about one percent as powerful as the 25,600-watt generator used in the Heard Island test and would operate no more than 20 minutes at a time, six times a day, there are substantial uncertainties as to how and to what extent the sound transmissions might affect marine mammals, particularly those that dive to great depths and use low-frequency sounds for communication or other purposes. Consequently, marine mammal studies were proposed to be conducted as part of the proof-of-concept study in both Hawaii and California. An advisory board, composed of five scientists not associated with the project, was established to provide advice on the design of the studies. The Marine Mammal Commission was asked and agreed to have a staff member serve as an *ex officio* member of the board.

In November 1993 the Commission received for review an application from Scripps Institution of Oceanography for a scientific research permit to conduct aerial surveys, behavioral observations, passive acoustic tracking, and shore-based visual observations, primarily of humpback whales, in the vicinity of the ATOC sound source proposed to be installed off Kauai. The Commission, in consultation with its Committee of Scientific Advisors, reviewed the application and by letter of 13 December 1993 recommended that the permit be issued with a *proviso*: that the ATOC experiment be suspended and the results reviewed by the National Marine Fisheries Service, in consultation with the Commission, if there were any indications that the experimental sound transmissions were altering the distribution, movements, or behavior of humpback whales or other marine mammals in ways that may affect their survival or productivity (*e.g.*, cause animals to abandon or avoid traditional feeding/breeding areas or interfere with feeding, breeding, calving, nursing, or other vital functions).

In February 1994 the Commission received and, in consultation with its Committee of Scientific Advisors, reviewed an application from Scripps Institution of Oceanography for a scientific research permit to determine how operation of the Point Sur, California, sound source might affect marine mammals. The Commission provided comments on that application by letter of 21 March 1994 to the National Marine Fisheries Service. In its comments, the Commission noted that, while the research program described

would clearly provide much useful information concerning the possible effects of low-frequency sound on marine mammals, it was not likely to provide sufficient information to conclude that operation of the Point Sur sound source would have negligible effects on marine mammals. In this regard, the Commission noted that design of the program appeared to have been driven by the desire to begin routine operation of the Point Sur sound source in spring 1994, rather than to resolve uncertainties concerning the possible effects of the sound transmissions on marine mammals. Also, it appeared that the program design was constrained by funding and technological considerations.

The Commission pointed out that it was unreasonable to expect that uncertainties concerning the possible effects of the proposed California ATOC program on marine mammals could be resolved in one or two years with limited funding, as seemed to be expected by the program's sponsors. The Commission recommended that the requested permit be issued provided that the National Marine Fisheries Service confirmed that the project sponsors were aware that the marine mammal research program described in the permit application was unlikely to provide all the information necessary to determine how and to what extent the California ATOC program might affect marine mammals; that the experiment be terminated immediately if there is any evidence that it may be jeopardizing the health or welfare of individual marine mammals or the populations of which they are a part; and that authority to continue the experiment after the first year be contingent on submission and approval of a report describing and evaluating the results of the studies done during the first year.

Several scientists, environmental groups, and legislators called for public hearings on the applications for scientific research permits concerning both the Hawaii and California marine mammal research programs. In response to these requests, the National Marine Fisheries Service held public hearings in Silver Spring, Maryland, on 22 March 1994, in Honolulu and Lihue, Hawaii, on 14 and 15 April 1994, and in Santa Cruz, California on 16 May, 1994. Among other things, individuals attending the hearings questioned whether the proposed research programs would resolve uncertainties concerning the possible effects of the ATOC program on marine mammals, sea turtles, fish, and other marine life that might be affected by the program. They questioned whether sufficient information was available or could be gathered prior to beginning the proposed ATOC transmissions to characterize the pre-transmission state of the marine mammal populations that possibly could be affected and thus serve as a basis for detecting changes in those populations. They also questioned whether placement and operation of the Point Sur sound source within the Monterey Bay National Marine Sanctuary was consistent with the Sanctuary's objectives or California's Coastal Zone Management Program. They called for expansion and revision of the proposed marine mammal research programs and preparation of environmental impact statements to ensure that the possible environmental impacts of transmissions from both sound sources are fully identified and evaluated.

In light of the concerns raised by scientists and others, the Advanced Research Projects Agency decided to prepare comprehensive environmental impact statements for both sites to ensure that all relevant issues have been identified and appropriately considered before moving ahead with the proposed ATOC program. Also, the oceanographers responsible for planning and carrying out the proof-of-concept study agreed to structure use of both the Hawaii and California sound sources during the start-up phase to facilitate acquisition of information necessary to determine how and to what extent the program might affect marine mammals and other biota.

The Marine Mammal Program Advisory Board met on 15 February, 13 June, and 22-23 September 1994 to review and provide advice on development of the ATOC-related marine mammal research programs in Hawaii and California. The Marine Mammal Commission's Scientific Program Director attended the meetings as an observer. Except for constraints imposed by funding, the designs of the marine mammal research programs have been structured to take account of the advice provided by the Advisory Board.

[The reports of the meetings of the Advisory Board can be obtained from the Chief Scientist, ATOC Marine Mammal Research Program, Christopher W.

Clark, Ph.D., Director, Bioacoustics Research Program, Cornell University Laboratory of Ornithology, 159 Sapsucker Woods Road, Ithaca, New York 14850.]

On 2 December 1994 the Draft Environmental Impact Statement/Environmental Impact Report for the California Acoustic Thermometry of Ocean Climate Project and its associated marine mammal research program was made available by the Advanced Research Projects Agency for review and comment. Comments are due by 31 January 1995. The draft statement for the Hawaii ATOC Project and its associated marine mammal research program is expected to be made available for public review and comment early in 1995.

At the end of the year, the Commission, in consultation with its Committee of Scientific Advisors, was reviewing and preparing comments on the draft assessment concerning the California ATOC project.

Navy Request for Small-Take Exemption

The National Defense Authorization Act requires that the hulls and critical components and systems of ships constructed for the Navy undergo shock tests prior to service with the fleet. The purpose of the tests is to evaluate the structure and electronic systems that are vital to the overall function and performance of the vessel and crew under combat conditions. To approximate combat conditions, ship-shock tests are conducted in deep, offshore waters by exploding charges of various sizes underwater and evaluating the effects on the hull and critical vessel systems and components.

On 13 May 1993 the Navy submitted an application to the National Marine Fisheries Service for authorization under section 101(a)(5)(A) of the Marine Mammal Protection Act to take marine mammals incidental to planned ship-shock trials in the Navy's Outer Sea Test Range, southwest of California's Channel Islands. The application was forwarded to the Marine Mammal Commission for review and comment on 1 June 1993.

The application indicated that 19 species of marine mammals, including several endangered whale species, could be taken incidentally in the course of the planned trials. It also indicated that Guadalupe fur seals and Steller sea lions, listed respectively as endangered and threatened under the Endangered Species Act, may occur occasionally in the test area, but because their numbers are so small, they were unlikely to be taken incidentally in the course of the planned trials. The application indicated that studies were being done to determine when and where within the test range marine mammals were least likely to occur. It provided an analysis of how and at what distances various species of marine mammals might be affected by the planned underwater detonations. It indicated that shock tests would not be done if marine mammals were observed within the estimated zone of impact and that surveys would be done following the tests to locate animals that may have been killed or injured by concussion. On 2 September 1993 the Navy modified its application seeking authorization to take two additional marine mammal species, the striped dolphin and the sei whale.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the application and forwarded comments to the National Marine Fisheries Service on 21 July 1993. The Commission noted that, with several exceptions, the application provided a thorough and reasonable assessment of how and how many marine mammals could be killed, injured, or harassed by the planned tests. One exception noted by the Commission was the apparent failure to recognize that several of the potentially affected marine mammal species were deep divers and to consider how depth may affect the distances at which those marine mammals may be affected. The Commission also pointed out that it was not clear that only small numbers of marine mammals would be taken and that the effects would be negligible, as required by section 101(a)(5) of the Act. The Commission questioned why the tests could not reasonably be carried out in another area where there would be less impact on the environment and less risk to endangered and threatened species. The Commission also questioned whether the Navy might reasonably do more to reduce the possibility that marine mammals are present in the area where they could be

affected by the underwater detonations, and to find and recover animals that are killed and injured.

The National Marine Fisheries Service forwarded the Commission's comments to the Navy. On 7 September 1993 representatives of the Navy met with representatives of the Commission to review the questions and concerns raised by the Commission. Navy representatives explained that the trials had to be done near the homeport of the ships to be tested (San Diego, in this case) so that pre-test preparations and post-test assessments and repairs could be done in conformance with regulations regarding the amount of time that Navy personnel may spend away from their homeport. Also, the test area is within a national test range where air and ship traffic can be controlled. The Navy officials maintained that effects would depend more on distance than depth and that the model used to estimate the potential zone of influence likely overestimated rather than underestimated distances at which marine mammals might be affected. They indicated that the Navy had considered possible means for underwater detection of marine mammals (*e.g.*, use of fishfinders and sonobuoys) and had concluded that nothing more reasonably might be done to further reduce the risk of detonating charges when marine mammals were present in the area where they could be killed or injured.

On 15 October 1993 the National Marine Fisheries Service issued proposed regulations to authorize the taking of small numbers of marine mammals incidental to the planned ship-shock trials. An environmental assessment on the requested incidental take authorization was made available by the Service on 14 October 1993.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the environmental assessment and provided comments to the Service on 9 December 1993. The Commission noted that it concurred with the Service's finding that the proposed action was not likely to have a significant adverse impact on marine mammals or other biota, but questioned whether all possible effects had been identified and evaluated. The Commission noted, for example, that the environmental assessment did not identify the number of ships and aircraft that may be involved in the ship-shock trials and related monitoring activities and how operation of those vessels might affect marine mammals and other biota. The Commission also noted that substantially more animals than estimated might actually be affected by the planned tests. The Commission pointed out that, while tests were not to be done when marine mammals were detected within the potential zone of influence, it was not clear precisely what criteria would be used to determine when there were no marine mammals present. In addition, the Commission noted that the environmental assessment did not include an assessment of possible alternative test sites where there might be less possibility of adversely affecting marine mammals and other marine species.

The Commission recommended that, if issued, the small-take exemption specify the criteria that must be used to decide when survey conditions and effort are adequate to detect the presence of marine mammals within the potential zone of influence. The Commission also recommended that the authorization specify that trials be suspended and means for avoiding mortality and injury of marine mammals be reviewed and revised as necessary if there is any indication that marine mammals are taken in ways or in numbers not anticipated.

On 3 February 1994 the National Marine Fisheries Service published a final rule authorizing, for a five-year period, the take of 21 species of marine mammals incidental to the proposed underwater detonation of explosives by the Navy in the Outer Sea Test Range offshore of Point Mugu, California. The rule anticipates that no more than ten tests, involving no more than 54 detonations, will be conducted each year. The explosive charges to be used will vary depending upon the test being conducted and will range in size from 1 to 10,000 pounds. At most, 12 detonations of the maximum charge size will be undertaken each year.

The final rule also estimates the maximum number of each of the 21 species of marine mammals that may be killed, injured, or harassed in the course of the proposed ship-shock tests. The species most likely to be taken is the northern elephant seal. The Service estimates up to 9 lethal takes, 158 injuries, and 724 takes by harassment for this species each year. The other species most likely to be taken are California sea

lions, Pacific white-sided dolphins, and northern right whale dolphins.

Under the final rule, three areas of 80 square nautical miles each are to be selected as possible sites for each ship shock test based upon the results of a year-long survey conducted by the National Marine Fisheries Service in 1993 and historical survey data. Aerial surveys are to be conducted in the three target areas one month prior to the first scheduled shock test to rank the areas based upon the observed densities of marine mammals. The primary area will be intensively surveyed two days prior to each shock test and, if marine mammal density in that area is higher than previously predicted, the alternate sites will be surveyed to determine their short-term suitability for the tests.

On the day of each test, aerial and surface surveys will be conducted to monitor the presence, behavior, and condition of marine mammals before and after the detonation. For tests involving the 10,000-pound charge, a safety zone with a radius of two nautical miles is to be established around the test site. If marine mammals, sea turtles, seabird flocks, or fish schools are observed in the safety zone or are on a track that will take them into the safety zone prior to detonation, the test is to be delayed until the area is clear. Also, tests are not to be conducted when the weather or sea conditions preclude adequate surveillance of the area.

Following each detonation, aerial reconnaissance will be flown over the area within three nautical miles of the test site to detect any marine mammals or other animals that may have been injured or killed by the blast. If post-test surveys determine that injurious or lethal take of a marine mammal has occurred, the test procedures and monitoring program will be reviewed and appropriate modifications made.

With respect to the recommendation made by the Commission and others that alternative test sites be considered, the National Marine Fisheries Service found such alternatives to be beyond the scope of its authority. In this regard, the preamble to the final rule states "[b]ecause NMFS is not authorizing the detonation of explosives, only the proposed taking of marine mammals incidental to such detonations, NMFS is of the opinion that the site determination and method of operation is the responsibility of the Navy (provided NMFS is assured that there was not a practicable alternative to ship shock testing that would result in not taking marine mammals)."

The Service also noted that using hydrophones or sonobuoys to detect deep-diving marine mammal species that may be in the area of the tests was not practical. The hydrophones used by the Navy to monitor the pressure waves produced by the explosions are not capable of recording marine mammal vocalizations. In addition, because a ship-shock trial is a mobile exercise, and because it would be necessary to triangulate on vocalizing marine mammals to determine whether they were within the vicinity of the trial, use of hydrophones to locate submerged marine mammals was determined to be impractical.

Pursuant to these regulations the Navy requested, and on 12 April 1994 the Service issued, a letter of authorization allowing the taking of marine mammals incidental to shock testing of the U.S.S. *John Paul Jones*.

On 12 April 1994, the Natural Resources Defense Council and other environmental organizations filed suit in the United States District Court for the Central District of California (*Natural Resources Defense Council* v. *United States Department of the Navy*) seeking to enjoin implementation of the regulations and to enjoin the Navy from conducting the ship-shock trial of the *John Paul Jones*. Plaintiffs alleged that the regulations and issuance of the letter of authorization violated the Marine Mammal Protection Act and the National Environmental Policy Act, primarily because the National Marine Fisheries Service and the Navy both failed to adequately consider possible alternative sites for the ship-shock trials. Plaintiffs further asserted that the regulations and letter of authorization violated the National Environmental Policy Act because no environmental impact statement had been prepared and that they violated the Migratory Bird Treaty Act because the ship-shock trials would likely result in the unauthorized taking of seabirds.

On 26 April 1994 the District Court issued a preliminary injunction barring implementation of the

small-take regulations. The court found that the plaintiffs had shown "a near-certain likelihood" of prevailing on the merits of their claims.

The court ruled that the Marine Mammal Protection Act unambiguously requires the National Marine Fisheries Service to consider alternative sites for the proposed action, at least when the project does not require the use of a particular site and when "the available information indicates that the proposed site is particularly likely to pose a high risk of harm to [marine] mammals." The court found the Service's interpretation of the statute, which would result in the taking of an unnecessarily high number of marine mammals, to be arbitrary and capricious.

The court also determined that the Navy had not established that its vessel-testing program necessitated a site within the Outer Sea Testing Range. The Navy's application for a small-take authorization had listed six requirements for the testing program: (1) water depth of 600 feet or greater; (2) sea state of Beaufort 4 or below; (3) control of air and water traffic in the area; (4) the capability to monitor the operations to detect marine life; (5) a site within 200 miles of the coast; and (6) a site that was "environmentally acceptable." In the court's view, given the Navy's authority and resources, these requirements could have been met at most locations within 200 miles of the west or east coasts of the United States. Therefore, the failure of the Service to consider alternative sites outside the Outer Sea Testing Range prior to issuing its regulations violated the Marine Mammal Protection Act.

The court further ruled that, even had the regulation been lawful, issuance of the letter of authorization violated the Act. The court found the manner used by the Service to select the three possible areas within the Outer Sea Testing Range where the shock tests of the *John Paul Jones* might be conducted to be arbitrary. In particular, the court took issue with the decision by the Service and the Navy not to survey areas more than 60 miles from shore.

The court did not rule on the contention that an environmental impact statement, rather than an environmental assessment, should have been prepared. It nevertheless found that, even if no environmental impact statement were required, the Service and the Navy had violated the National Environmental Policy Act by not considering alternative sites as part of its environmental assessment.

Subsequent to issuance of the injunction, the litigants worked out a settlement agreement. That agreement was approved by the court on 5 May 1994. Under the agreement, the agencies were to conduct concurrent surveys of the government's proposed test area and a specified area further from shore. The shock test of the *John Paul Jones* was to be conducted in the area determined by the government, in consultation with the plaintiffs, to have the lower number of marine mammals observed per survey mile. If the alternative area were determined to have a lower density of marine mammals, an additional pre-test survey would be conducted. The parties further agreed that, once the test site was chosen, the test would be conducted in accordance with the protocol established by the Navy and the Service, with the additional requirement that sonobuoys be deployed to detect marine mammals that may be within the two-nautical-mile safety zone.

The Federal agencies also agreed that, following completion of the shock trial of the *John Paul Jones*, they would prepare an environmental impact statement on the remaining detonations prior to issuance of additional letters of authorization. The agreement reserved the rights of the plaintiffs to challenge any future regulations or letters of authorization.

Pursuant to the agreement, the Service conducted surveys of the two potential test areas. Because of rough seas in the area further from shore, only five days of surveys could be completed. The Navy predicted that it would take an additional three or four weeks to complete the eight days of surveys called for under the settlement agreement. Because of the delay involved with completing the surveys, and the fact that the data collected had shown no significant differences in marine mammal population densities, the Navy, with the concurrence of the Service, decided to conduct the trials in the alternative site recommended by the Natural Resources Defense Council.

Shock tests of the *John Paul Jones* were conducted on 9 June and 27 June 1994 in an area approximately 90 nautical miles southwest of San Nicolas Island. Each test involved the detonation of a single 10,000-pound charge. Post-detonation surveys detected no dead or injured marine mammals, and all marine mammals observed in the post-test search zone were behaving normally. Although the shock test of the *John Paul Jones* involved only two detonations, the Navy believes that four detonations are necessary to test the design features of a vessel more thoroughly.

At the end of 1994 the Navy had yet to begin drafting the environmental impact statement called for in the settlement agreement and had no further shock tests scheduled in the Outer Sea Test Range.

Other Small-Take Authorizations

The 1994 amendments to the Marine Mammal Protection Act added section 101(a)(5)(D) to provide a streamlined mechanism for authorizing the incidental take of small numbers of marine mammals when only taking by unintentional harassment is involved, when the taking will have a negligible impact on the species or stock, and when the taking will not have an unmitigable adverse impact on the availability of the marine mammals for Native subsistence. As of the end of 1994 one applicant had requested an incidental take authorization under this provision.

On 28 August 1994 the Washington Department of Corrections applied to the National Marine Fisheries Service for authorization to take small numbers of harbor seals by harassment incidental to non-explosive demolition and reconstruction of the deteriorating Still Harbor Dock Facility on MacNeil Island in Puget Sound. The Service prepared an environmental assessment on the requested taking and on 8 November 1994 published in the *Federal Register* a proposed authorization for public review and comment. As noted by the Service, a small-take authorization under section 101(a)(5)(D) is limited to one year. The proposed authorization therefore would apply only to demolition activities. Construction activities, planned for the second year of the project, would require a separate authorization.

The Commission provided comments on the proposed authorization and the environmental assessment by letter of 8 December 1994. The Commission concurred that removal of the existing dock and construction of a new dock would likely result in taking only a small number of harbor seals by harassment and would likely have a negligible impact on the local harbor seal population. The Commission noted, however, that the details of the monitoring program required to confirm that the effects are, in fact, negligible had yet to be agreed upon. Without specific information concerning the proposed monitoring program, it was not possible for the Commission to judge whether any non-negligible effects that may result from the proposed activities are likely to be detected. The Commission therefore recommended that the proposed small-take authorization not be issued until the uncertainties concerning the monitoring program are resolved and the Service is able to conclude that the program is appropriate for detecting possible harmful effects on the local harbor seal population.

The Commission also questioned the scheduling of the proposed demolition and construction activities. The environmental assessment indicated that disturbance of harbor seals tends to be greater during periods when seals are pupping or nursing, when aggregations are dense, and during the molting season. Yet dock removal and construction were scheduled to occur in November, which coincides with the seal's molting season. Noting the statutory requirement that the small-take authorization, if issued, prescribe "permissible methods of taking by harassment pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat...," the Commission commented that lesser impact to harbor seals apparently could be achieved by delaying activities until the end of the molting season early in December. The Commission therefore recommended that the Service, before issuing the authorization, determine whether a shift in the project schedule is "practicable" in light of other considerations, including possible effects on other species of wildlife.

At the end of 1994 the Service had yet to issue a small-take authorization for the proposed demolition activities.

Chapter XIII

MARINE MAMMALS IN CAPTIVITY

Under the Marine Mammal Protection Act, permits to take marine mammals for purposes of public display, scientific research, or enhancing the survival or recovery of a species or stock may be issued by the Secretary of Commerce or the Secretary of the Interior, depending upon the species of marine mammal involved. Prior to the enactment of amendments on 30 April 1994, the Act required that such permits specify the methods of capture, supervision, care, and transportation to be followed pursuant to and after the authorized taking or importation. In the view of the National Marine Fisheries Service, this provision required it to include permit conditions regarding the maintenance of the animals in captivity.

As discussed in Chapter XII, a district court ruling in *Mirage Resorts* v. *Franklin* threw into question the Secretaries' authority to regulate the supervision, care, and maintenance of captive marine mammals. It found that the Marine Mammal Protection Act was enacted "to deal with issues arising from the capture of marine mammals from their natural habitat," while the Animal Welfare Act was enacted "to deal with issues arising from the existence of these mammals in captivity." It enjoined the Secretary of Commerce from regulating the "acquisition, exhibit, transportation, handling, care and maintenance of captive marine mammals." In the court's view, the Animal Welfare Act confers sole authority for such matters to the Department of Agriculture's Animal and Plant Health Inspection Service. Consistent with this view, the 1994 amendments to the Marine Mammal Protection Act clarified that the National Marine Fisheries Service and Fish and Wildlife Service have limited authority over marine mammals once they are removed from the wild.

In the absence of authority for either the National Marine Fisheries Service or the Fish and Wildlife Service to oversee care and maintenance of captive marine mammals under the Marine Mammal Protection Act, and in light of other amending language, it is expected that the Animal and Plant Health Inspection Service will increase its role under its existing Animal Welfare Act authority.

Since its inception, the Marine Mammal Commission has worked with the responsible agencies to ensure the safety and well-being of marine mammals in captivity. When permits authorizing the captive maintenance of marine mammals were first issued under the Marine Mammal Protection Act, each included conditions concerning the care of those animals. In the mid-1970s the Commission, in consultation with the National Marine Fisheries Service and the Fish and Wildlife Service, developed recommended standards for the care of captive marine mammals generically. The Commission's recommended standards were considered by the Animal and Plant Health Inspection Service in 1979 when it first promulgated captive maintenance regulations for marine mammals under the Animal Welfare Act. Subsequently, the Animal and Plant Health Inspection Service standards were incorporated by reference into all Marine Mammal Protection Act permits authorizing captive maintenance. As discussed below, the Commission continues to advocate a thorough review and updating of those standards.

Noting the diminished role of the National Marine Fisheries Service for overseeing captive maintenance of marine mammals and the need to increase the Animal and Plant Health Inspection Service's attention to such matters, the Commission by letter of 6 August 1994 offered to convene an interagency panel to review how the amendments affect the Animal and Plant Health Inspection Service's marine mammal program and to identify the resources needed for the Service to satisfy its role. By letter of 12 September 1994 the Service responded favorably to the Commis-

sion's offer and accepted the terms of reference the Commission had drafted.

At the end of 1994 the Commission was preparing background material for a panel of officials from appropriate Federal agencies to review the Animal and Plant Health Inspection Service's marine mammal program and make recommendations for staffing and funding levels needed to enable the Service to meet its responsibilities.

A major concern to the Commission during the past several years has been programs in which members of the public are allowed to enter the water and interact with captive bottlenose dolphins. As discussed in Chapter XII, four marine mammal facilities were previously authorized by the National Marine Fisheries Service to conduct swim-with-the-dolphin programs. Because of possible health and safety risks to both dolphin and human participants, these programs were considered experimental and were authorized on a provisional basis.

As a consequence of the 1994 amendments to the Marine Mammal Protection Act, the National Marine Fisheries Service no longer has authority to regulate or otherwise control these programs. The Animal and Plant Health Inspection Service, under authority of the Animal Welfare Act, has assumed responsibility and intends to publish applicable regulations that take into account the conditions previously imposed by the National Marine Fisheries Service and the findings of a recently completed study on swim-with-the-dolphin programs. The regulations are also expected to take into account the result of a workshop on veterinary care of dolphins involved in such programs. The Animal and Plant Health Inspection Service has drafted interim regulations that, at the end of 1994, were awaiting clearance for publication. The regulations are expected to be published early in 1995.

Care and Maintenance Standards

In light of the amendments, the Animal and Plant Health Inspection Service now regulates the humane handling, housing, care, treatment, and transportation of marine mammals under the Animal Welfare Act. The standards governing such activities were first adopted in 1979 and then amended in 1984; they have not been updated since then to reflect advances in animal husbandry and marine mammal science. On 29 May 1990 the Marine Mammal Commission held a meeting of representatives of the Animal and Plant Health Inspection Service, the National Marine Fisheries Service, and the Fish and Wildlife Service to discuss the need to revise the standards. It was agreed that an interagency review of the standards was desirable and, as a first step, the Commission on 31 July 1991 provided to the Animal and Plant Health Inspection Service a comprehensive discussion paper identifying shortcomings in the current standards and raising questions to be addressed as part of the review.

In response, the Animal and Plant Health Inspection Service on 23 July 1993 published an advance notice of proposed rulemaking, indicating that it was considering revising its marine mammal standards. Based on the discussion paper developed by the Commission, the Service specifically solicited public comment on certain elements of the standards including water quality, water and air temperatures, noise levels, swim-with-the-dolphin programs, record-keeping requirements with regard to husbandry, and maintaining marine mammals in isolation. The Commission provided comments on 5 October 1993, reiterating the suggestions made in its 31 July 1991 letter. The Commission also called attention to the 29 May 1990 meeting at which the involved agencies agreed to an interagency process for conducting the review and asked the Service to advise the Commission if it intended to follow that approach.

Subsequently, the Animal and Plant Health Inspection Service decided to investigate using negotiated rulemaking to review and revise its marine mammal standards and guidelines. As part of the negotiated rulemaking process, the Service has identified issues to be addressed, parties to be represented, the product of the rulemaking, and required funding. The Service also selected a convener to study the feasibility of applying the negotiated rulemaking process to the revision of the standards. After interviewing interested parties, the convener identified the major issues to be considered and is now preparing a list of potential panel members to participate in the negotiated rulemaking. The Service will then appoint a facilitator to

assist those appointed to the panel in reaching consensus. Because the rulemaking panel is subject to the Federal Advisory Committee Act, its meetings will be announced in the *Federal Register* and open to the public.

The first meeting of the negotiated rulemaking panel is expected to be held in the spring of 1995. By letter of 30 November 1994 to the Animal and Plant Health Inspection Service, the Marine Mammal Commission recommended that the Service include a research scientist on the negotiated rulemaking panel and that it start the process as soon as possible since care and maintenance issues will continue to be difficult to address without revised standards.

Foreign Facilities

Section 104(c)(9) of the Marine Mammal Protection Act, added by the 1994 amendments, prohibits the export of marine mammals for the purposes of public display, scientific research, or species enhancement "unless the receiving facility meets standards that are comparable to the requirements that a person must meet to receive a [Marine Mammal Protection Act] permit...for that purpose." That is, authorization to export marine mammals from the United States is dependent on the foreign facility's meeting requirements pertaining to education or conservation programs, Animal and Plant Health Inspection Service licensure, public accessibility, and other requirements. Because foreign facilities are not subject to licensing or registration requirements under the Animal Welfare Act, it is only through the Marine Mammal Protection Act's comparability requirement that some attempt to assure the well-being of exported animals can be made. How best to determine and enforce comparability with the Animal and Plant Health Inspection Service licensing requirements is an issue still being reviewed by the responsible agencies.

By letter of 26 August 1994 the Animal and Plant Health Inspection Service requested the Commission's views on an outline of information to be submitted by foreign facilities to enable the Service to determine that comparable standards have been met. By letter of 8 September 1994 the Commission provided its views on that document and more generally on the determinations that must be made prior to allowing the export of marine mammals to foreign facilities. The Commission noted that to meet requirements of comparability, a foreign facility must offer a program for education or conservation purposes that is based on professionally recognized standards of the public display community; a facility must satisfy requirements comparable to those for obtaining a registration or license under the Animal Welfare Act; and a facility must be open to the public on a regularly scheduled basis with access unrestricted other than by charging an admission fee. The Commission concluded that, for exports, such determinations can only reliably be made by conducting an inspection of the foreign facility. The Animal and Plant Health Inspection Service responded that it does not have authority or jurisdiction to inspect a foreign facility but will cooperate in making arrangements for a courtesy inspection at the request of the foreign facility or government. While the Service cannot compel a foreign facility to submit to an inspection, the Commission believes that it is permissible and appropriate to condition approval of the export of marine mammals from the United States on the foreign facility agreeing to and passing an inspection.

Releasing Marine Mammals to the Wild

In response to a Congressional directive to "...develop training procedures which will allow mammals which are no longer required for this project to be released back into their natural habitat...," the U.S. Navy held two workshops to consider issues related to such reintroduction and late in 1993 published a report of the findings entitled "Reintroduction to the Wild as an Option for Managing Navy Marine Mammals." The report notes that there is no compelling scientific reason for reintroducing non-endangered species.

The National Marine Fisheries Service is developing release criteria for stranded marine mammals that will also be used to assess applications for the release of long-term captive marine mammals. The Marine Mammal Commission by letter of 30 November 1994 recommended that the Service refrain from considering any permit applications seeking authority to release marine mammals until agreed release criteria are in place.

APPENDIX A

MARINE MAMMAL COMMISSION RECOMMENDATIONS IN 1994

3 January	Commerce, public display permit, Sugarloaf Dolphin Sanctuary.
4 January	Commerce, modification of scientific research permit, LGL Ltd., Environmental Research Associates.
6 January	Commerce, commenting to the National Marine Fisheries Service on a notice of intent to conduct a status review of the Steller sea lion; recommending that the Service (1) complete the status review using existing data, and, if indicated, reclassify the population as endangered, (2) identify the cause or causes of the decline and expand efforts to reverse them, and (3) re-activate the Recovery Team on a permanent basis to advise on activities needed to identify the cause(s) of the decline and promote recovery of the species; further recommending that the Service establish objective, measurable criteria for deciding whether or not to reclassify the species under the Endangered Species Act and that the draft criteria be circulated to the Commission and the Steller Sea Lion Recovery Team for review and comment.
10 January	Commerce, modification of scientific research permit, Southwest Fisheries Science Center.
10 January	Interior, modification of scientific research permit, Mote Marine Laboratory.
12 January	Interior, forwarding to the Fish and Wildlife Service a copy of a legal analysis of U.S. compliance with the Agreement for the Conservation of Polar Bears; and recommending that the Service consider the analysis in developing its views on, among other issues, reauthorization of the Marine Mammal Protection Act, the development of a conservation plan for polar bears, the preparation of a Polar Bear Habitat Conservation Strategy, and the possible development of an agreement with the Russian Federation for the Chukotka-Alaska polar bear population.
18 January	Commerce, scientific research permit, Robert D. Yates.
18 January	Commerce, scientific research permit, Southwest Fisheries Science Center.
18 January	Commerce, scientific research permit, Ronald J. Schusterman.
2 February	Commerce, modification of scientific research permit, Cetacean Research Unit.
2 February	Commerce, scientific research permit, Hiroyuki Suganuma.
2 February	Commerce, modification of scientific research permit, Alaska Fisheries Science Center.
3 February	Commerce, modification of scientific research permit, Glacier Bay National Park.
3 February	Commerce, modification of scientific research permit, Kathryn A. Ono.
3 February	Commerce, modification of scientific research permit, Mark J. Ferrari and Deborah A. Glockner-Ferrari.
7 February	Commerce, modification of scientific research permit, Bruce R. Mate.

7 February	Commerce, modification of scientific research permit, Alaska Department of Fish and Game.
7 February	Commerce, modification of scientific research permit, National Marine Mammal Laboratory.
17 February	Commerce, modification of scientific research permit, Alaska Fisheries Science Center.
18 February	Commerce, modification of scientific research permit, Dan R. Salden.
23 February	Commerce, public display permit, Aquacircus of Cape Cod Limited Partnership.
23 February	Commerce, scientific research permit, New York Zoological Society.
23 February	Commerce, scientific research permit, Richard Coleman.
2 March	Commerce, modification of scientific research permit, Fred A. Sharpe.
2 March	Commerce, modification of scientific research permit, Frank Cipriano.
8 March	Interior, modification of scientific research permit, Graham A.J. Worthy.
11 March	Interior, commenting to the Fish and Wildlife Service on the December 1993 Draft Conservation Plan for the Polar Bear in Alaska; recommending that the plan be modified to include the State of Alaska as a third cooperator in polar bear management and conservation agreements; endorsing the proposed formation of an Alaskan Polar Bear Commission and development of a polar bear conservation and management agreement for northwest Alaska; noting that the prohibitions on taking cubs and using aircraft and large motorized vessels for hunting, as prescribed by the 1973 Agreement on the Conservation of Polar Bears, should be added, and that the involvement of local organizations would allow coastal residents to become involved with conservation and management.
16 March	Interior, commenting to the Minerals Management Service on the call for information regarding proposed oil and gas lease sale #148 in the Chukchi Sea; recommending that the Service (1) consult the National Marine Fisheries Service to determine studies needed to assess, detect, and mitigate the possible effects of the proposed activities on gray whales and other marine mammals, (2) consult the Fish and Wildlife Service to determine what actions the Minerals Management Service should take to help implement the conservation plans for walruses and polar bears, and (3) consult with the National Marine Fisheries Service, the Fish and Wildlife Service, the Alaska Department of Fish and Game, and Alaska Native groups to identify long-term monitoring studies to ensure that the development would not harm marine mammals and/or alter their availability for subsistence uses.
21 March	Commerce, scientific research permit, National Marine Mammal Laboratory.
21 March	Commerce, commenting to the National Marine Fisheries Service on an application for a scientific research permit from Scripps Institution of Oceanography, Acoustic Thermometry of Ocean Climate (ATOC) Program, to assess the effects on marine mammals of sounds used to measure ocean temperature; commenting that the proposed research should be authorized as a pilot project; recommending approval provided that (1) the Service confirms that the project sponsors are aware that the proposed research is unlikely to provide all the information necessary to determine that the effects of the planned program on marine mammals will be negligible, (2) marine mammals will only be taken by harassment, and (3) any effects on behavior, hearing, *etc.* will be short-term so that monitoring during the proposed periods can be compared with periods when the source is operating to provide an unbiased assessment of effects, and (4) the instrumentation to be attached to animals will not jeopardize their health or alter behavior in ways that would bias experimental results; further recommending that (1) the permit be terminated immediately if there is evidence that research may be

jeopardizing the health or welfare of individual animals or their populations, (2) the Service consult with the applicant to establish criteria for determining whether observed effects are negligible and could be authorized under section 101(a)(5) of the Marine Mammal Protection Act, (3) authority to continue the experiment after the first year be contingent upon submission and approval of a report describing and evaluating the results of the first-year studies, and (4) activities under the permit be coordinated with other research to avoid duplication; and requesting that the Service ensure that both the applicant and project sponsors are aware that, if marine mammals may be taken incidental to the proposed program, (a) it will be necessary to obtain incidental taking authority under the Marine Mammal Protection Act and perhaps under the Endangered Species Act, and (b) it may be necessary to identify and assess alternative means for meeting the program objectives in order to satisfy the requirements of the National Environmental Policy Act and the Endangered Species Act.

21 March — Commerce, scientific research permit, Southwest Fisheries Science Center.

29 March — Commerce, modification of scientific research permit, Scott D. Kraus.

29 March — Commerce, modification of scientific research permit, Andrew W. Trites.

30 March — Commerce, scientific research permit, A. Rus Hoezel.

30 March — Interior, public display permit, Marine World Africa, USA.

8 April — Commerce, modification of scientific research permit, Robin Brown.

8 April — Commerce, modification of scientific research permit, Norihisa Baba.

13 April — Commerce, scientific research permit, Northeast Fisheries Science Center.

13 April — Commerce, scientific research permit, National Marine Mammal Laboratory.

13 April — Commerce, public display permit, North Carolina Zoological Park.

14 April — Commerce, scientific research permit, National Marine Mammal Laboratory.

26 April — Commerce, scientific research permit, Boyd Gibbons.

28 April — Commerce, scientific research permit, Robin W. Baird.

28 April — Commerce, modification of scientific research permit, Craig O. Matkin.

28 April — Commerce, modification of scientific research permit, Brent S. Stewart.

2 May — Interior, modification of scientific research permit, National Biological Survey.

2 May — Commerce, modification of scientific research permit, Bruce R. Mate.

4 May — Commerce, public display permit, Ervin and Sonja Strong.

4 May — Commerce, modification of scientific research permit, Randall W. Davis, *et al.*

4 May — Commerce, modification of scientific research permit, Craig O. Matkin.

5 May — Commerce, modification of two scientific research permits, College of the Atlantic.

9 May	Commerce, modification of scientific research permit, Elizabeth A. Mathews.
12 May	Commerce, modification of scientific research permit, Raymond Tarpley.
12 May	Commerce, modification of scientific research permit, J. Ward Testa and Michael Castellini.
13 May	Commerce, public display permit, World Safari Company, Ltd.
13 May	Commerce, scientific research permit, Michael E. Goebel and Daniel P. Costa.
17 May	Commerce, modification of scientific research permit, John Calambokidis.
19 May	Commerce, modification of scientific research permit, Randall S. Wells.
23 May	Commerce, modification of scientific research permit, Bruce R. Mate.
24 May	Commerce, modification of scientific research permit, Ronald J. Schusterman.
24 May	Commerce, modification of scientific research permit, Daniel P. Costa, Burney J. Le Boeuf, and Charles L. Ortiz.
25 May	Commerce, modification of scientific research permit, Alaska Department of Fish and Game.
27 May	Commerce, scientific research permit, North Gulf Oceanic Society.
27 May	U.S. Army, commenting to the Corps of Engineers on a permit request by American Norwegian Fish Farms, Inc., to engage in large-scale aquaculture off the coast of Massachusetts; noting that such an operation could adversely affect endangered right and humpback whales, as well as five species of endangered or threatened sea turtles; noting that consultation with the National Marine Fisheries Service under section 7 of the Endangered Species Act should be initiated; further noting that preparation of an Environmental Impact Statement seems warranted; and recommending that action on the current permit application be deferred pending further review by interested agencies.
1 June	Commerce, modification of scientific research permit, C. Scott Baker.
1 June	Commerce, scientific research permit, S. Jonathan Stern.
2 June	Commerce, scientific research permit, Jeffrey D. Goodyear and Janice M. Straley.
2 June	Commerce, scientific research permit, Jeffrey D. Goodyear.
3 June	Commerce, responding to a request from the National Marine Fisheries Service for recommendations for members of the regional scientific review groups mandated by the 1994 amendments to the Marine Mammal Protection Act; suggesting various individuals for consideration as members; and recommending that the Service consult with Mr. Caleb Pungowiyi for membership suggestions.
6 June	Interior, modification of scientific research permit, Carle Foundation Hospital.
6 June	Interior, modification of scientific research permit, Alaska Fish and Wildlife Research Center, National Biological Survey.
10 June	Commerce, recommending to the National Marine Fisheries Service that it (1) make full use of the Steller Sea Lion Recovery Team, (2) seek the team's continuing advice on needed conservation

actions, and (3) provide funding for the Recovery Team; and also recommending that the Service take immediate steps to develop reclassification criteria for the Steller sea lion, independent of the results of 1994 range-wide surveys.

10 June — Commerce, commenting to the National Marine Fisheries Service on its status review of harbor seals in Alaska to determine whether any population stock should be designated depleted under the Marine Mammal Protection Act; recommending that the Service (1) appoint a group of experts to finalize a conservation plan for harbor seals in the central and western gulf of Alaska, and (2) in consultation with the Alaska Department of Fish and Game and the Alaska Native community, obtain and conduct genetic analyses of tissue samples from harbor seals being taken for subsistence and research purposes in order to expedite stock definition and completion and implementation of the conservation plan.

15 June — Interior, commenting to the Minerals Management Service on its call for information regarding proposed gas and oil lease sales #157 and #161 in the central and western Gulf of Mexico; recommending that the Service, if it has not already done so, consult with the National Marine Fisheries Service and the Fish and Wildlife Service to identify long-term monitoring programs to ensure that oil and gas exploration do not disadvantage marine mammals; and forwarding a bibliography and other documents that may be of assistance to the Service.

16 June — Commerce, modification of scientific research permit, Scott D. Kraus.

16 June — Commerce, modification of scientific research permit, National Marine Mammal Laboratory.

16 June — Commerce, modification of scientific research permit, Boyd Gibbons.

16 June — Interior, scientific research permit, Fish and Wildlife Service.

17 June — Commerce, recommending to the National Marine Fisheries Service that it immediately take steps necessary to complete action on the petition to designate critical habitat for right whales under the Endangered Species Act.

21 June — Interior, modification of scientific research permit, National Biological Survey.

27 June — Interior, modification of scientific research permit, National Biological Survey.

27 June — Commerce, modification of scientific research permit, Southeast Fisheries Science Center.

1 July — Commerce, modification of scientific research permit, William A. Watkins.

14 July — Interior, commenting to the Fish and Wildlife Service on a request by Kuiu Kwan, Inc., to export sea otter pelts; noting that the requirement that sea otters be acquired lawfully may not have been met; and recommending that the Service review the exceptions noted in section 102 (a) of the Marine Mammal Protection Act to determine whether it provides authority for the proposed export.

18 July — Interior, commenting to the Fish and Wildlife Service on implementation of the Agreement on the Conservation of Polar Bears; recommending that the Service convene a meeting of representatives of interested governmental and non-governmental entities to review a legal analysis of polar bear management provided by the Commission; recommending that the Service keep a member of the Marine Mammal Commission updated on (a) all matters relating to the review of the Agreement and the U.S. implementation of the agreement, and (b) the preparation of negotiating positions regarding the proposed polar bear research agreement with Russia so that the required consultations with the Marine Mammal Commission occurs on a timely basis; and further recommending that the Commis-

sioner be included as a member of the U.S. delegation negotiating cooperative polar bear research and management programs with Russia.

22 July — Interior, scientific research permit, Washington State University.

26 July — Interior, commenting to the Minerals Management Service on the Draft Environmental Impact Statement, Gulf of Mexico Sales 152 and 155: Central and Western Planning Areas; recommending, among other things, that the Service (1) consult with the Fish and Wildlife Service and the National Marine Fisheries Service to obtain the best information on marine mammal populations and habitat, and any alternatives to the proposed action that might be taken to minimize possible adverse effects, (2) revise the document to include information on manatees along the rim of the Gulf of Mexico, and assess possible effects of a major oil spill on manatee distribution and abundance in known habitat areas, (3) ensure that (a) the monitoring requirements of section 20 of the Lands Act are being met, and (b) lessees are aware of the Marine Mammal Protection Act's prohibition on taking and its requirement for a small-take exemption; and (4) implement site-specific and population monitoring programs to verify that marine mammals and their habitat are not adversely affected by offshore oil and gas activities in the northern Gulf of Mexico.

26 July — Commerce, scientific research permit, Robert Elsner.

27 July — Commerce, modification of scientific research permit, Northwest and Alaska Fisheries Science Center.

27 July — Commerce, scientific research permit, Paul J. Ponganis.

27 July — Commerce, commenting to the U.S. Commissioner, International Whaling Commission, on coastal development projects that will affect the calving and breeding grounds of the eastern North Pacific stock of gray whales in Baja California Sur; recommending among other things that the National Oceanic and Atmospheric Administration, in consultation with the Department of State, develop and implement a strategy for identifying and encouraging needed conservation measures, including (a) improved communications, (b) environmental impact assessments for both ongoing and planned activities that might adversely affect gray whales and their habitat in Mexico, and (c) cooperative identification, planning, and funding of needed research and monitoring programs.

27 July — Commerce, commenting to the National Marine Fisheries Service on its program to provide emergency financial assistance and grants to help northeastern U.S. fishermen affected by the collapse of regional groundfish stocks; recommending support of a pilot project to hire displaced commercial fishermen to test the feasibility of locating, recovering, and properly disposing of lost gillnets in northeast groundfish fishing grounds; noting some areas off New England probably contain large amounts of derelict gear that may be catching millions of dollars worth of commercially valuable fish and shellfish annually.

29 July — Commerce, commenting to the National Marine Fisheries Service on the draft Five-Year Plan for Research and Monitoring of the Eastern North Pacific Population of Gray Whales; recommending that the plan be revised to (1) indicate the magnitude of population change that would be required in order to be detected within the next five years, (2) include identification of human activities that could affect the principal calving and breeding lagoons in Baja California and summer feeding grounds in the Bering and Chukchi Seas, and (3) indicate how population productivity and the dependence of the eastern North Pacific gray whale population on specific feeding and breeding areas will be measured; and further recommending that the resources required to accomplish the various tasks be provided.

1 August — Commerce, scientific research permit, Naval Command Control and Ocean Surveillance Center.

9 August — Commerce, modification of scientific research permit, Alaska Fisheries Science Center.

23 August	Interior, scientific research permit, National Biological Survey.
31 August	Commerce, scientific research permit, National Marine Mammal Laboratory.
1 September	Interior, commenting to the U.S. Fish and Wildlife Service on the draft Florida Manatee Recovery Plan; recommending that the Service (1) expedite their ongoing efforts to complete and circulate a final draft revised plan for public review, and (2) adopt a final revised plan by the end of 1994.
13 September	Commerce, commenting to the National Marine Fisheries Service on the proposed transfer of four Atlantic bottlenose dolphins from the Navy's facility in San Diego, California, to Gulfarium in Fort Walton Beach, Florida; and approving the transfer provided that the Animal and Plant Health Inspection Service is satisfied that the facility meets the space requirements.
19 September	Interior, public display permit, Daesaeng Corporation.
21 September	Commerce, modification of scientific research permit, Dena Matkin.
27 September	Commerce, modification of scientific research permit, Dan R. Salden.
6 October	Commerce, modification of scientific research permit, Adam Frankel.
12 October	Commerce, scientific research permit, John G. Morris.
12 October	Commerce, scientific research permit, Glenn R. VanBlaricom.
31 October	Commerce, scientific research permit, Point Reyes Bird Observatory International Biological Research.
1 November	Commerce, scientific research permit, James T. Harvey, *et al.*
9 November	Commerce, modification of scientific research permit, Glacier Bay National Park.
9 November	Commerce, modification of scientific research permit, Southwest Fisheries Science Center.
10 November	Commerce, modification of scientific research permit, Adam Frankel.
30 November	Agriculture, commenting to the Animal and Plant Health Inspection Service on the negotiated rulemaking for revising the marine mammal care and maintenance standards and guidelines; recommending that the Department (1) charter the negotiated rulemaking panel under the Federal Advisory Committee Act, (2) initiate the rulemaking process as soon as possible and (3) include a research scientist on the panel.
30 November	Commerce, commenting to the National Marine Fisheries Service on its development and implementation of objective criteria to determine at what point a marine mammal undergoing rehabilitation is returnable to the wild; recommending that the Service refrain from considering permit applications seeking authority to release marine mammals until release criteria are finalized.
30 November	Interior, commenting to the Fish and Wildlife Service on the National Marine Fisheries Service's development and implementation of objective criteria to determine at what point a marine mammal undergoing rehabilitation is returnable to the wild; commenting that the Commission believes that, with the exception of captive manatees and rehabilitated California sea lions, the Service should not consider permit applications seeking authority to release marine mammals until the release criteria are finalized; noting that the Interagency Oceanaria Manatee Group provides sufficient oversight for release of manatees, and that California sea otters being released are rehabilitated beached/stranded

animals, not long-term captive animals; and further commenting that it is not necessary to stop releasing rehabilitated sea otters from the threatened California population while the criteria are being developed.

30 November — Interior, commenting to the National Biological Survey on funding and personnel needs for the Survey's Sirenia Project; noting that past Commission recommendations for research management priorities and levels of support for the Florida Manatee Recovery Program have served as budgeting documents for both the Service and Congressional committees; recommending that the Survey (1) maintain the Project's existing base funding level, and if possible increase funding, and (2) hire, if possible, two additional full-time employees to (a) analyze and publish the scar catalog and telemetry databases, and (b) develop and implement a manatee ecosystem assessment and population monitoring program.

30 November — Commerce, commenting to the National Marine Fisheries Service on recommendations from the Third International Conference on Marine Debris held on 8-13 May 1994; noting that one recommendation is that pilot studies be conducted to assess the feasibility of retrieval of derelict fishing gear; recommending that the National Oceanic and Atmospheric Administration sponsor a two-year pilot derelict gear recovery project off New England in order to (a) recover derelict nets and traps that impact commercial fish and shellfish stocks, and (b) gather data necessary for estimating the densities of derelict gear, types and quantities of fish and shellfish being caught, and the costs and benefits of such additional work; and also conveying to the Service six additional recommendations made at the Third International Conference on Marine Debris to address the problem of ghost fishing, and asking that the Service advise on the Commission what actions have been or might be taken to implement the measures.

30 November — Commerce, commenting to the National Marine Fisheries Service on the status of the Hawaiian monk seal and the Service's recovery program; recommending that the Service carry out various specific actions on the following issues: (1) restoration of monk seals at the Midway Islands; (2) improvement of facilities and expertise to rehabilitate and care for monk seals in captivity; (3) improvement in assessments of monk seal prey availability and feeding ecology; (4) minimization of mobbing incidents; (5) monitoring of populations at breeding sites; (6) improvement of data management, analysis, and reporting; (7) protection of Tern Island; (8) evaluation and minimization of monk seals' interactions with commercial fisheries; (9) provision of increased recovery program funding and personnel support; and (10) increased interagency coordination; and recommending, among other things, that the Service (1) facilitate and expand contaminant analyses at the Midway Islands; (2) expand its ability to care for monk seals in captivity by at least an additional 15 animals; (3) initiate long-term research on feeding ecology at the Midway Islands and French Frigate Shoals, including further scat analyses and a five-year program to tag and track seals; (4) establish a long-term population monitoring program at Kure Atoll, Pearl and Hermes Reef, Necker Island, and Nihoa Island; (5) hire a full-time veterinarian, a data analyst, and several part-time field assistants; and (6) close the waters within 20 nautical miles of French Frigate Shoals to commercial lobster fishing until information is available to indicate that the fishery is not likely to limit the growth of the monk seal population there.

30 November — Navy, commenting on the status of the Hawaiian monk seal and the Navy's role in conserving the species; noting that the Navy's use of the Midway Islands as a Naval Air Station since the early 1940s is likely the principal reason for the near disappearance of the seals at the atoll; recommending that the Navy (1) transfer ownership of the Midway Islands to the Fish and Wildlife Service for inclusion in the National Wildlife Refuge System, (2) commit to no other agency than the Fish and Wildlife Service for the use of Midway or its runway unless the Fish and Wildlife Service and the Commission have been consulted and confirm that such use or would be compatible with the goals of the Refuge; and further recommending that the Navy provide the funding and/or logistic support needed to further recovery of the population until it has been restored to at least the level observed in 1957-58.

30 November — Commerce, commenting to the National Marine Fisheries Service on the Service's efforts to assess the status and reduce the incidental take of harbor porpoises found in coastal waters from the Bay of Fundy to Florida (referred to as the Gulf of Maine stock); recommending that the Service (1) immediately establish a take reduction team to begin developing a plan for reducing the incidental take of harbor porpoises from the Gulf of Maine stock by gillnet fisheries off the United States and Canada, and (2) continue to maintain a dialogue with appropriate Canadian officials, and that Canadian representatives be invited to participate on the take reduction team; further recommending that the Service ask the New England Fishery Management Council to consult with regional gillnet fishermen to develop (a) an accelerated schedule for phasing in incidental take reduction measures under Amendment 5 to the Northeast Multispecies Fishery Management Plan that are more closely in line with the requirements of the 1994 amendments to the Marine Mammal Protection Act, and (b) its recommendations for time-area restrictions called for under the Fishery Management Plan in time to be put in place by June, 1995.

30 November — Commerce, commenting to the National Marine Fisheries Service on the establishment and use of objective, measurable criteria in making the decision whether or not to reclassify the Steller sea lion as endangered under the Endangered Species Act; noting that the Service indicated in a 31 January 1994 letter to the Commission that such criteria will be developed and circulated to the Commission for review, but that no such criteria had been forthcoming; requesting that the Service advise the Commission on the status of the criteria's development.

1 December — Interior, commenting and providing recommendations to the Fish and Wildlife Service on the draft stock assessments mandated by the 1994 amendments to the Marine Mammal Protection Act for all marine mammal stocks under the Fish and Wildlife Service's jurisdiction.

1 December — Commerce, commenting and providing recommendations to the National Marine Fisheries Service on the draft stock assessments mandated by the 1994 amendments to the Marine Mammal Protection Act for marine mammal stocks under the National Marine Fisheries Service's jurisdiction in Alaska, Hawaii, Washington, Oregon, and California.

1 December — Commerce, commenting to the National Marine Fisheries Service on the interim final rule implementing the general authorization for scientific research under the Marine Mammal Protection Act; supporting the National Marine Fisheries Service and the Fish and Wildlife Service's working together to adopt consistent, if not identical, implementing regulations; and recommending that the regulations be revised to clarify that support personnel and research assistants are to be covered by the general authorization applicable to the applicant and his or her co-investigators.

2 December — Interior, commenting to the Minerals Management Service on the proposed Russian Federation/United States joint oil and gas lease sale in the Chukchi Sea and Hope Basin planning areas; recommending that the Service consult with the National Marine Fisheries Service to (a) determine what steps have been taken to design and conduct studies to determine the dependence of gray whales on feeding areas in the Bering and Chukchi Seas, (b) provide information about the oil and gas exploration- and development-related activities that are expected to occur in conjunction with the proposed leasing in the Bering and Chukchi Seas, and (c) identify additional studies needed to determine and mitigate the possible effects of the proposed lease sales on gray whales and other marine mammals, and their habitat; recommending that the Service consult the Fish and Wildlife Service to (1) determine what actions the Minerals Management Service should take to help implement the walrus conservation plan and complete and implement the Polar Bear Habitat Conservation Strategy; further recommending that the Service consult with the Fish and Wildlife Service and the Department of State to determine how it can help implement the 1973 Agreement on the Conservation of Polar Bears and other international agreements.

5 December — Commerce, modification of scientific research permit, Pacific Whale Foundation.

5 December	Commerce, modification of scientific research permit, Marsha Green.
6 December	Interior, scientific research permit, National Biological Survey.
6 December	Interior, scientific research permit, National Biological Survey.
6 December	Interior, scientific research permit, Sea World, Inc.
6 December	Commerce, modification of scientific research permit, University of Hawaii.
8 December	Commerce, commenting to the National Marine Fisheries Service on its proposal to authorize the incidental take by harassment of harbor seals during the demolition and reconstruction of a foul-weather dock at the MacNeil Island Correction Center, Washington, and on the Environmental Assessment for the project; recommending that the proposed small take exemption not be issued until the monitoring program has been finalized and will detect any possible harmful effects on the local harbor seal population; and further requesting that the Service notify the Commission of the rationale for the proposed construction schedule so that the Commission can determine if the requirements of the Marine Mammal Protection Act have been satisfied.
9 December	Interior, scientific research permit, Edmund Gerstein.
12 December	Commerce, commenting and providing recommendations to the National Marine Fisheries Service on the draft stock assessments mandated by the 1994 amendments to the Marine Mammal Protection Act for marine mammal stocks under the National Marine Fisheries Service's jurisdiction in U.S. waters off the eastern and Gulf states.
15 December	Commerce, commenting to the National Marine Fisheries Service on the proposed Fiscal Year 1995 Marine Entanglement Research Program Plan; recommending (1) that the Service proceed to carry out the projects as described, and (2) that, if the proposal to hire a statistician in fiscal year 1995 is not possible, funds programmed for that task be reallocated to support projects to retrieve and assess the impact of derelict fishing gear; and recommending that the Program provide support for a derelict gear retrieval program as recommended in the Commission's 30 November 1994 letter to the Service.
16 December	Commerce, commenting to the National Oceanic and Atmospheric Administration on its role in addressing coastal development projects that will affect the calving and breeding grounds of the eastern North Pacific stock of gray whales in Baja California Sur, Mexico, as well as threats to gray whales and their habitat posed by U.S. activities along migratory paths and in high latitudes; recommending, among other things, that, within the National Marine Fisheries Service's gray whale program, highest possible priority be given to (a) identifying threats to habitat, particularly in calving and breeding lagoons, and (b) determining how to mitigate existing threats and prevent others from becoming a reality; and conveying a recently completed Commission-sponsored report of research on effects of noise on gray whales in San Ignacio Lagoon.
16 December	Commerce, modification of scientific research permit, Andrew W. Trites.
16 December	Commerce, modification of scientific research permit, Bruce R. Mate.
16 December	Commerce, modification of scientific research permit, Deborah A. Glockner-Ferrari and Mark J. Ferrari.
16 December	Commerce, modification of scientific research permit, Southwest Fisheries Science Center.

19 December — Commerce, commenting to the National Marine Fisheries Service on the status of harbor seals and gray seals in New England, and possible direct and indirect interactions with commercial and recreational fisheries; recommending that the Service determine (a) the types of marine mammal-fishery conflicts that are likely to arise from the continuing growth of gray seal and harbor seal populations in the northeast, (b) when and where such conflicts are likely to occur, (c) additional information that is needed to make reasonable judgments concerning probable cause-effect relationships, (d) the research and monitoring programs that will be required, and (e) how best to avoid or mitigate conflicts and adverse impacts on the interacting fish stocks, fisheries, and marine mammal stocks; and further recommending that the costs of the assessment and follow-up studies be supported with funds appropriated for fishery-related programs.

19 December — Commerce, commenting to the National Marine Fisheries Service on the testing of marine mammal specimens for bacteria, biotoxins, contaminants, and viral diseases; recommending that the Service approach the Department of Agriculture for the purpose of establishing arrangements for viral screening of specimen materials; and recommending that the Service (a) determine the types of screens that would help facilitate identification of non-viral causes of unusual marine mammal mortality events, (b) identify the Department of Agriculture facilities best equipped to do the screens and arrange for their use, and (c) advise the regional marine mammal stranding networks of the arrangements.

19 December — Commerce, commenting to the National Marine Fisheries Service on the Report and Recommendations of the Ballard Locks Pinniped-Fisheries Interaction Task Force, including the minority views; recommending among other things that the Service (1) be ready to implement appropriate actions at Ballard Locks by 1 January 1995, (2) expedite its status review of Lake Washington winter run steelhead trout and, if it determines that this run constitutes a distinct population under the Endangered Species Act, that the Service consider an emergency listing under the Act, (3) before authorizing any intentional lethal take, identify all non-lethal alternatives and explain whether they are believed to be infeasible or imprudent and why; further recommending that the Service, (1) in determining whether the State of Washington has demonstrated that it has taken all reasonable non-lethal steps to address the predation problem without success, consider which of the available alternatives to lethal removal are wholly or partially within the State's authority to implement, (2) include a statistically reliable correction factor based on the relative percentages of hatchery and wild fish at the Locks in any calculation used to trigger lethal removal that includes total predation as a factor, and (3) immediately identify all resources available for maintaining captive sea lions on a short-term basis; recommending that the Service consult with various public and private groups regarding the implementation of the preferred option, and that the results of the consultations be reflected in the Service's analysis of the application; and recommending that the Service consider adopting implementing regulations that, among other things, would clarify the Service's ability to authorize non-lethal taking under section 120 of the Marine Mammal Protection Act if alternatives to lethal removal were determined to be available and practicable.

20 December — Commerce, modification of scientific research permit, Scott D. Kraus.

20 December — Commerce, modification of scientific research permit, James H.W. Hain.

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. 1991. Harbor seal habitat restoration at Strawberry Spit, San Francisco Bay. Final report for MMC contract MM2910890-9. NTIS PB91-212332. 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 PB80-176910. 31 pp. (A03)

Anderson, D.M., and A.W. White. 1989. Toxic dinoflagellates and marine mammal mortality: Proceedings of an expert consultation held at Woods Hole Oceanographic Institution. Final report for MMC contract T6810848-1. NTIS PB90-160755. 71 pp. (A04)

Baker, C.S., J.M. Straley, and A. Perry. 1990. Population characteristics of humpback whales in southeastern Alaska: summer and late-season, 1986. Final report for MMC contract MM3309822-5. NTIS PB90-252487. 23 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 PB80-224728. 42 pp. (A03)

Bean, M.J. 1984. 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. 56 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 PB80-206105. 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. 14 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. Schonewald, 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)

Buckland, S.T., and K.L. Cattanach. 1990. Review of current population abundance estimates of small cetaceans in the Black Sea. Final report for MMC contract T75133135. NTIS PB91-137257. 5 pp. (A02)

Carr, T. 1994. The manatees and dolphins of the Miskito Coast Protected Area, Nicaragua. Final report for MMC contract T94070376. NTIS PB94-170354. 19 pp. (A03)

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 MM207934-1-0. NTIS PB82-189507. 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 MM13-00702-9. NTIS PB81-109860. 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 PB80-150097. 43 pp. (A03)

Dohl, T.P. 1981. Remote laser branding of marine mammals. Final report for MMC contract MM4AC011. NTIS PB81-213449. 34 pp. (A03)

Dowling, T.E., and W.M. Brown. 1992. Population structure of the Atlantic bottlenose dolphin as determined by restriction endonuclease analysis of mitochondrial DNA. Final report for MMC contract MM3309818-6. NTIS PB93-128411. 46 pp. (A03)

Erickson, A.W. 1978. Population studies of killer whales (*Orcinus orca*) in the Pacific Northwest: a radio-marking

[1] **Price codes for printed reports (including postage) are shown in parentheses at the end of each citation. The key to the codes and ordering information can be found at the end of Appendix B.**

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)
Fay, F.H., B.P. Kelly, and B.A. Fay (eds). 1990. The ecology and management of walrus populations -- report of an international workshop. Final report for MMC contract T68108850. NTIS PB91-100479. 186 pp. (A09)
Forestell, P.H. 1989. Assessment and verification of abundance estimates, seasonal trends, and population characteristics of the humpback whale in Hawaii. Final report for MMC contract MM2911014-6. NTIS PB90-190273. 66 pp. (A04)
Foster, M.A. 1981. Identification of ongoing and planned fisheries in the Northwestern Hawaiian Islands. Final report for MMC contract MM1801069-7. NTIS PB81-207 516. 90 pp. (A05)
Foster, M.S., C.R. Agegian, R.K. Cowen, R.F. Van Wagenen, D.K. Rose, and A.C. Hurley. 1979. Toward an understanding of the effects of sea otter foraging on kelp forest communities in central California. Final report for MMC contract MM7AC023. NTIS PB-293 891. 60 pp. (A04)
Fowler, C.W., W.T. Bunderson, M.B. Cherry, R.J. Ryel, and B.B. Steele. 1980. Comparative population dynamics of large mammals: a search for management criteria. Final report for MMC contract MM7AC013. NTIS PB80-178 627. 330 pp. (A15)
Fowler, C.W., R.J. Ryel, and L.J. Nelson. 1982. Sperm whale population analysis. Final report for MMC contract MM8AC009. NTIS PB82-174335. 35 pp. (A03)
Fox, W.W., Jr., *et al.* 1990. Statement of concerned scientists on the reauthorization of the Magnuson Fishery Conservation and Management Act. NTIS PB91-127647. 6 pp. (A02)
Fraker, M.A. 1994. California sea lions and steelhead trout at the Chittenden Locks, Seattle, Washington. Final report for MMC contract T10156766. NTIS PB94-188059. 42 pp. (A05)
Freeman. J., and H. Quintero. 1990. The distribution of West Indian manatees (*Trichechus manatus*) in Puerto Rico: 1988-1989. Final report for MMC contract T5360348-3. NTIS PB91-137240. 38 pp. (A03)
Gaines, S.E., and D. Schmidt. 1978. Laws and treaties of the United States relevant to marine mammal protection policy. Final report for MMC contract MM5AC029. NTIS PB-281 024. 668 pp. (A99)
Gard, R. 1978. Aerial census, behavior, and population dynamics study of gray whales in Mexico during the 1974-75 calving and mating season. Final report for MMC contract MM5AC006. NTIS PB-275 295. 18 pp. (A02)
Gard, R. 1978. Aerial census and population dynamics study of gray whales in Baja California during the 1976 calving and mating season. Final report for MMC contract MM6AC014. NTIS PB-275 297. 20 pp. (A03)
Geraci, J.R., and D.J. St. Aubin. 1979. Biology of marine mammals: insights through strandings. Final report for MMC contract MM7AC020. NTIS PB-293 890. 343 pp. (A16)
Geraci, J.R., S.A. Testaverde, D.J. St. Aubin, and T.H. Loop. 1978. A mass stranding of the Atlantic white-sided dolphin, *Lagenorhynchus acutus*: a study into pathobiology and life history. Final report for MMC contract MM5AC008. NTIS PB-289 361. 141 pp. (A08)
Gerrodette, T. 1983. Review of the California sea otter salvage program. Final report for MMC contract MM2629677-5. NTIS PB83-262949. 23 pp. (A03)
Gilbert, J.R., V.R. Schurman, and D.T. Richardson. 1979. Grey seals in New England: present status and management alternatives. Final report for MMC contract MM7AC002. NTIS PB-295 599. 40 pp. (A03)
Glockner-Ferrari, D.A., and M.J. Ferrari. 1985. Individual identification, behavior, reproduction, and distribution of humpback whales, *Megaptera novaeangliae*, in Hawaii. Final report for MMC contract MM262975-5. NTIS PB85-200772. 36 pp. (A03)
Gold, J. 1981. Marine mammals: a selected bibliography. Final report for MMC contract MM1801254-3. NTIS PB 82-104282. 91 pp. (A05)
Gonsalves, J.T. 1977. Improved method and device to prevent porpoise mortality: application of polyvinyl panels to purse seine nets. Final report for MMC contract MM6AC007. NTIS PB-274 088. 28 pp. (A03)
Goodman, D. 1978. Management implications of the mathematical demography of long lived animals. Final report for MMC contract MM8AD008. NTIS PB-289 678. 80 pp. (A05)
Green, K.A. 1977. Antarctic marine ecosystem modeling revised Ross Sea model, general Southern Ocean budget, and seal model. Final report for MMC contract MM6AC032. NTIS PB-270 375. 111 pp. (A06)
Green-Hammond, K.A. 1980. Fisheries management under the Fishery Conservation and Management Act, the Marine Mammal Protection Act, and the Endangered Species Act. Final report for MMC contract MM1300885-3. NTIS PB80-180 599. 186 pp. (A09)
Green-Hammond, K.A. 1981. Requirements for effective implementation of the Convention on the Conservation of Antarctic Marine Living Resources. Final report for MMC contract MM2079173-9. NTIS PB82-123571. 36 pp. (A03)
Green-Hammond, K.A. 1982. Environmental aspects of potential petroleum exploration and exploitation in Antarctica: forecasting and evaluating risks. Final report for MMC contract MM2079173-9. NTIS PB82-169772. 28 pp. (A03)
Green-Hammond, K.A., D.G. Ainley, D.B. Siniff, and N.S. Urquhart. 1983. Selection criteria and monitoring requirements for indirect indicators of changes in the availability of Antarctic krill applied to some pinniped and seabird information. Final report for MMC contract MM2324753-6. NTIS PB83-263 293. 37 pp. (A03)
Hain, J.H.W. 1992. Airships for marine mammal research: evaluation and recommendations. Final report for MMC contract T68108863. NTIS PB92-128271. 37 pp. (A03)
Hain, J.H.W., S.L. Ellis, and P.E. Seward. 1994. Characterization of vessel traffic at the St. Johns and St. Marys channel entrances, northeast Florida, January 1993. Final report for MMC contract T94070460. NTIS PB94-204229. 56 pp. (A04)
Hatfield, B.B. 1991. Summary report of observations of coastal gill and trammel net fisheries in central California - October 1, 1984 - March 31, 1985. Final report for MMC contract MM2910891-2. NTIS PB91-191908. 17 pp. (A03)
Heneman, B., and Center for Environmental Education. 1988. Persistent marine debris in the North Sea, northwest Atlantic Ocean, wider Caribbean area, and the west coast of Baja California. Final report for MMC contract MM3309598-5. NTIS PB89-109938. 161 pp. (A08)
Henry, M.E. 1987. Observations of gill and trammel net fishing activity between Pt. Buchon and Pt. Sur, California,

June-October 1985. Final report for MMC contract MM3309511-8. NTIS PB87-184024. 30 pp. (A03)

Herman, L.M., P.H. Forestell, and R.C. Antinoja. 1980. The 1976/77 migration of humpback whales into Hawaiian waters: composite description. Final report for MMC contracts MM7AC014 and MM1300907-2. NTIS PB80-162 332. 55 pp. (A04)

Hofman, R.J. (ed). 1979. A workshop to identify new research that might contribute to the solution of the tuna-porpoise problem. Proceedings of a Marine Mammal Commission-sponsored workshop held on 8-9 December 1975 at the University of California, Santa Cruz. NTIS PB-290 158. 17 pp. (A02)

Hofman, R.J. 1982. Identification and assessment of possible alternative methods for catching yellowfin tuna. NTIS PB83-138 993. 243 pp. (A11)

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Hoover-Miller, A. 1992. Assessment of the possible use of a cooperative/coordinated geographic information system (GIS) to facilitate access to, and integration and analysis of, data bearing upon the conservation of marine mammals in Alaska. Final report for MMC contract T75136297. NTIS PB93-128429. 59 pp. (A04)

Hoover-Miller, A.A. 1994. Harbor seal (*Phoca vitulina*) biology and management in Alaska. Final report for MMC contract T75134749. NTIS PB95-166195. 45 pp. (A03)

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Hui, C.A. 1978. Reliability of using dentin layers for age determination in *Tursiops truncatus*. Final report for MMC contract MM7AC021. NTIS PB-288444. 25 pp. (A03)

Irvine, A.B., M.D. Scott, R.S. Wells, J.H. Kaufmann, and W.E. Evans. 1979. A study of the activities and movements of the Atlantic bottlenosed dolphin, *Tursiops truncatus*, including an evaluation of tagging techniques. Final report for MMC contracts MM4AC004 and MM5AC018. NTIS PB-298 042. 54 pp. (A04)

Jameson, G.L. 1986. Trial systematic salvage of beach-cast sea otter, *Enhydra lutris*, carcasses in the central and southern portion of the sea otter range in California: one year summary of results: October 1983-September 1984. Final report for MMC contract MM2629849-8. NTIS PB87-108288. 60 pp. (A04)

Jeffries, S.J. 1986. Seasonal movement and population trends of harbor seals (*Phoca vitulina richardsi*) in the Columbia River and adjacent waters of Washington and Oregon, 1976-1982. Final report for MMC contract MM2079357-5. NTIS PB86-200243. 41 pp. (A03)

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Johnson, B.W., and P.A. Johnson. 1978. The Hawaiian monk seal on Laysan Island: 1977. Final report for MMC contract MM7AC009. NTIS PB-285 428. 38 pp. (A03)

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Johnson, M.L., and S.J. Jeffries. 1977. Population evaluation of the harbor seal (*Phoca vitulina richardi*) in the waters of the State of Washington. Final report for MMC contract MM5AC019. NTIS PB-270 376. 27 pp. (A03)

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Jones, M.L., S.L. Swartz, and M.E. Dahlheim. 1994. Census of gray whale abundance in San Ignacio lagoon: a follow-up study in response to low whale counts recorded during an acoustic playback study of noise-effects on gray whales. Final report for MMC contract MM2911023-0. NTIS PB94-195062. 32 pp. (A03)

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Kooyman, G.L. 1982. Development and testing of a time-depth recorder for marine mammals. Final report for MMC contract MM6AC019. NTIS PB82-257932. 10 pp. (A02)

Kraus, S.D. 1985. A review of the status of right whales (*Eubalaena glacialis*) in the western North Atlantic with a summary of research and management needs. Final report for MMC contract MM2910905-0. NTIS PB86-154143. 61 pp. (A04)

Kraus, S.D., and R.D. Kenney. 1991. Information on right whales (*Eubalaena glacialis*) in three proposed critical habitats in United States waters off the western North Atlantic Ocean. Final report for MMC contracts T75133740 and 75133753. NTIS PB91-194431. 65 pp. (A04)

Lefebvre, L.W., and J.A. Powell. 1990. Manatee grazing impacts on seagrasses in Hobe Sound and Jupiter Sound in southeast Florida during the winter of 1988-89. Final report for MMC contracts T62239152, T68108782. NTIS PB90-271883. 36 pp. (A03)

Lentfer, J.W. (ed). 1988. Selected marine mammals of Alaska: species accounts with research and management recommendations. Final report for MMC contract MM2910798-4. NTIS PB88-178462. 275 pp. (A013)

Lentfer, J.W. 1990. Workshop on measures to assess and mitigate the adverse effects of arctic oil and gas activities on polar bears. Final report. NTIS PB91-127241. 43 pp. (A03)

Loughlin, T. 1978. A telemetric and tagging study of sea otter activities near Monterey, California. Final report for MMC contract MM6AC024. NTIS PB-289 682. 64 pp. (A04)

Marine Mammal Commission. 1974. Annual report of the Marine Mammal Commission, calendar year 1973. Report to Congress. NTIS PB-269 709. 14 pp. (A03)

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Marine Mammal Commission. 1989. Annual report of the Marine Mammal Commission, calendar year 1988. Report to Congress. NTIS PB89-166 524. 237 pp. (A11)

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Marmontel, M., T.J. O'Shea, and S.R. Humphrey. 1990. An evaluation of bone growth-layer counts as an age-determination technique in Florida manatees. Final report for MMC contract T6223918-1. NTIS PB91-103564. 94 pp. (A06)

Mate, B.R. 1977. Aerial censusing of pinnipeds in the eastern Pacific for assessment of population numbers, migratory distributions, rookery stability, breeding effort, and recruitment. Final report for MMC contract MM5AC001. NTIS PB-265 859. 67 pp. (A04)

Mate, B.R. 1980. Workshop on marine mammal-fisheries interactions in the northeastern Pacific. Final report for MMC contract MM8AC003. NTIS PB80-175144. 48 pp. (A04)

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Matkin, C.O., and F.H. Fay. 1980. Marine mammal-fishery interactions on the Copper River and in Prince William Sound, Alaska, 1978. Final report for MMC contract MM8AC013. NTIS PB80-159536. 71 pp. (A05)

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APPENDIX C

SELECTED LITERATURE PUBLISHED ELSEWHERE RESULTING FROM COMMISSION-SPONSORED ACTIVITIES

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APPENDIX D

SUMMARY OF THE 1994 AMENDMENTS TO THE MARINE MAMMAL PROTECTION ACT OF 1972

Public Law 103-238, the Marine Mammal Protection Act Amendments of 1994, was enacted on April 30, 1994. The amendments reauthorized appropriations for the Marine Mammal Commission, the Department of Commerce, and the Department of the Interior, the agencies responsible for implementing the Marine Mammal Protection Act, and made substantial changes to many of the Act's provisions. The most significant amendments involved adoption of a new regime to govern the take of marine mammals incidental to commercial fishing operations to replace the interim exemption which has been in place since 1988. Major changes were also made to the Act's permit provisions. A complete summary of the amendments follows.

Three new sections were added to the Act to address interactions between commercial fisheries and marine mammals. New section 117 requires the preparation of marine mammal stock assessments and constitutes the scientific basis for the new regime to govern the taking of marine mammals incidental to commercial fisheries. New section 118 sets forth the requirements of the new incidental take regime. The new regime focuses on reducing the incidental mortality and serious injury of marine mammals from strategic stocks — *i.e.*, those that are listed as endangered or threatened under the Endangered Species Act or declining and likely to be listed in the foreseeable future, those designated as depleted under the Marine Mammal Protection Act, and those for which human-caused mortality exceeds the estimated replacement yield. New section 120 calls on the Secretary of Commerce to study pinniped-fishery interactions and provides a mechanism for authorizing the lethal removal of individual pinnipeds that are adversely affecting certain salmonid stocks, without obtaining a waiver of the Act's moratorium on taking.

Section 117: Stock Assessments

Within 60 days of the enactment of the amendments, the Secretary of Commerce is to establish three regional scientific review groups consisting of individuals with expertise in marine mammal biology and ecology, population dynamics and modeling, commercial fishing technology and practices, and stocks taken by Alaska Natives for subsistence and handicraft purposes. The Secretary is to appoint regional groups for Alaska, the Pacific Coast, including Hawaii, and the Atlantic Coast, including the Gulf of Mexico, after consultations with the Secretary of the Interior, the Marine Mammal Commission, the Governors of the affected States, regional fish and wildlife management authorities, Alaska Native organizations and Indian tribes, and environmental and fisheries groups. Among other things, the regional scientific review groups are to advise the Secretary on (1) the estimated size, status, and trends of marine mammal stocks; (2) uncertainties regarding stock separation, abundance, or trends, and research needed to resolve those uncertainties; (3) uncertainties and needed research regarding the species, numbers, ages, gender, and reproductive status of marine mammals; (4) research needed to identify modifications in fishing gear and practices likely to reduce the incidental mortality and serious injury of marine mammals; and (5) the actual, expected, or potential impacts of habitat destruction on marine mammals and, for strategic stocks, conservation or management measures to alleviate such impacts.

By 1 August 1994 the Secretary, in consultation with the appropriate regional scientific review group, is to prepare a draft stock assessment for each marine mammal stock which occurs in waters under the jurisdiction of the United States. Each stock assessment is to (1) describe the geographic range of the stock; (2) provide a minimum population estimate, the stock's current and maximum net productivity rates, and current population trend, including a description of the information upon which these are based; (3) estimate the annual human-caused mortality and serious injury, by source, and, for stocks determined to be strategic stocks, describe other factors that may be causing a decline or impeding recovery; (4) describe the commercial fisheries that interact with the stock, including an estimate of the number of vessels in each fishery, fishery-specific estimates of mortality and serious injury levels and rates, a description of seasonal or area differences in incidental mortality and serious injury, and an analysis of whether incidental take levels are approaching a zero mortality and serious injury rate; (5) assess whether the level of human-caused mortality and serious injury is not likely to cause the stock to be reduced below its optimum sustainable population or, alternatively, whether the stock should be categorized as a strategic stock; and (6) estimate

the potential biological removal level for the stock and describe the information used to calculate it.

The draft stock assessments are to be made available for a 90-day public comment period. Within 90 days of the close of the public comment period, the Secretary is to issue a final stock assessment and publish a summary thereof in the *Federal Register*. Stock assessments must be reviewed at least annually for strategic stocks and at least once every three years for other stocks. An exception to the generally applicable timing requirements was included for stocks subject to taking by Alaska Natives. If requested by an Alaska Native covered by the Act's Native exemption, the Secretary must conduct a formal adjudicatory hearing to examine the information contained in the draft assessment prior to publishing a final stock assessment or any revision of a final stock assessment.

Section 118: Taking of Marine Mammals Incidental to Commercial Fishing Opertions

Section 118 establishes the new regime for governing the taking of marine mammals incidental to commercial fishing operations. When implemented, it will replace the interim exemption, which has regulated fisheries-related incidental taking since 1988. Under a transition provision, the new regime is to become effective when implementing regulations are in place or on 1 September 1995, whichever is earlier.

Actions required to implement new section 118 are the responsibility of the Secretary of Commerce. The amendments require, however, that the Secretary consult with the Secretary of the Interior before taking any action or making any determination that affects or relates to marine mammal stocks under the jurisdiction of the Department of the Interior — *i.e.*, manatees, dugongs, sea otters, polar bears, and walrus.

As with the interim exemption, all commercial fishermen using vessels of the United States (except those participating in the eastern tropical Pacific yellowfin tuna fishery) or foreign vessels permitted under section 204(b) of the Magnuson Fishery Conservation and Management Act are covered by the new regime. Yellowfin tuna purse seiners will continue to be subject to the requirements of their general permit. Also, as under the interim exemption, the incidental taking of California sea otters is not authorized under the new regime. Rather, such takings will continue to be regulated under Public Law 99-625.

Like the interim exemption, the new regime retains the Act's goal of reducing mortality and serious injury of marine mammals incidental to commercial fisheries to insignificant levels approaching a zero rate. However, it establishes a seven-year time frame by which such reductions should occur. At the end of three years, the Secretary is to review the progress made by each fishery towards achieving the zero mortality and serious injury goal and report the findings to Congress. If sufficient progress in achieving the goal has not been made by a fishery, the Secretary shall make appropriate revisions to the applicable take reduction plan.

Other similarities between the new regime and the interim exemption include the registration of vessels participating in certain fisheries with frequent or occasional interactions with marine mammals; a requirement that vessel owners or operators report incidental mortalities and injuries of marine mammals; an observer program to monitor levels of incidental takes; and authority to issue emergency regulations to address immediate and significant adverse impacts to marine mammal stocks. Another similarity between the new regime and the interim exemption is the categorization of fisheries according to the frequency with they which they interact with marine mammals. However, the basis for such categorizations differs between the two — under the interim exemption fisheries were categorized according to the frequency with which marine mammals were taken; under the new regime fisheries are to be categorized based on the frequency with which marine mammals are incidentally killed or seriously injured.

The new regime also differs significantly from the interim exemption in several ways. Unlike the interim exemption, the taking of marine mammals listed as endangered or threatened under the Endangered Species Act may be authorized in those instances whenthe incidental mortality and serious injury from commercial fisheries will have a negligible impact on the species or stock. Under the new regime, the intentional lethal taking of marine mammals by commercial fishermen is no longer allowed to protect gear or catch. Another substantial difference is the requirement under the new regime for the Secretary to prepare and implement take reduction plans.

Within 90 days of enactment, the Secretary is to publish for public review and comment any proposed changes to the list of fisheries adopted under the interim exemption. Fisheries will continue to be placed into three categories. Categorization of each fishery will depend on whether it frequently, occasionally, or rarely kills or seriously injures marine mammals. After a comment period of at least 90

days, the Secretary is to publish a final list of fisheries, identifying which marine mammals interact with each fishery and estimating the number of vessels participating in each fishery. The Secretary is also to publish a summary of the provisions of the new regime and provide information to fishermen on how to obtain the necessary authorization and otherwise comply with the new requirements. The classification of fisheries on the list is to be reviewed at least annually.

Vessels participating in fisheries identified as frequently or occasionally killing or seriously injuring marine mammals are required to register to obtain authorization to take marine mammals. To register, vessel owners must provide their name and that of the vessel operator, the name and description of the vessel, the fisheries in which the vessel will participate, the approximate time, duration, and location of such fishery operations, and a general description of the type and nature of gear and techniques that will be used. Upon receipt of a completed registration form, the Secretary is to issue a decal or other evidence of registration, indicating that the vessel is authorized to take marine mammals in accordance with the provisions of the new incidental take regime. Such authorizations are to be renewed annually. Vessel owners who have registered and hold valid certificates of exemption under the interim exemption need not re-register under the new provisions until expiration of their current authorization.

Any incidental taking of a marine mammal in a fishery for which registration is required will constitute a violation of the Act if (1) the vessel owner has not registered; (2) evidence of the registration is not displayed on the vessel or is not in the possession of the master; (3) required reports are not submitted; or (4) the requirements of an applicable incidental take reduction plan or emergency regulations have not been complied with. It will also constitute a violation to participate in any such fishery without applying for and obtaining the necessary registration. Lesser penalties (a $100 fine for each offense) will be applicable for vessel owners who register but who fail to carry evidence of that authorization on board the vessel when it is engaged in such a fishery. In addition, the Secretary may suspend or revoke an authorization to take marine mammals if the vessel owner fails to comply with applicable reporting requirements, refuses to carry an observer when required to do so, or fails to comply with applicable take reduction plans or emergency regulations. Previous failure to comply with the requirements of the interim exemption will not be grounds for revoking or denying authorization under the new regime.

Owners of vessels engaged in fisheries identified as having only a remote possibility of incidentally killing or injuring marine mammals need not register. They are only required to report any incidental mortality or injury of a marine mammal in the form and manner prescribed by the Secretary.

The amendments direct the Secretary to establish a program to monitor marine mammal mortality and serious injury incidental to commercial fisheries in order to obtain statistically reliable estimates of take levels, ascertain whether reports submitted by fishermen are reliable, and identify changes in fishing methods or technology that may decrease the level of take. The Secretary may require vessels participating in fisheries that frequently or occasionally kill or injure marine mammals to carry observers, but may place observers on vessels in fisheries identified as having only a remote possibility of taking marine mammals only with the consent of the vessel owner. Priority for placing observers is to go first to fisheries that take endangered or threatened marine mammals, second to those taking marine mammals from strategic stocks, and third to those fisheries that take marine mammals from stocks of uncertain status. The Secretary is also authorized to establish an alternative observer program to observe commercial fishing operations from other vessels, aircraft, or points on shore.

All incidental mortalities and injuries of marine mammals are to be reported by the vessel owner or operator. Such reports are to be submitted within 48 hours of the end of the fishing trip on which the mortality or injury occurred, on a postage-paid form to be developed by the Secretary.

Section 118(f): Take Reduction Plans

A crucial element of the new incidental take regime is the provision requiring the Secretary to develop and implement incidental take reduction plans. A take reduction plan is to be developed for each strategic stock (including all those that are endangered, threatened, or depleted) that interacts with a fishery that frequently or occasionally kills or seriously injures marine mammals. The Secretary may also develop take reduction plans for other marine mammal stocks that interact with a fishery with frequent incidental takes, if the Secretary determines, after public notice and comment, that the fishery is responsible for a high level of mortality and serious injury across a number of marine mammal stocks. In the event that insufficient funding is available to develop and implement all required take reduction plans, highest priority is to be given to plans for

stocks whose level of incidental mortality and serious injury exceeds the potential biological removal level, those that have a small population size, and those which are declining most rapidly.

Take reduction plans, among other things, are to include recommended regulatory or voluntary measures designed to reduce incidental mortality and serious injury, and recommended dates for achieving specific objectives of the plan. The immediate goal of a take reduction plan for a strategic stock is to reduce, within six months, incidental mortality or serious injury to levels less than the potential biological removal level calculated in the stock assessment. The long-term goal of the plan is to reduce incidental mortality and serious injury to insignificant levels approaching a zero rate within five years, taking into account the economics of the fishery, existing technology, and applicable State or regional fishery management plans.

For stocks where mortality and serious injury incidental to commercial fisheries exceeds the potential biological removal level, the take reduction plan is to include measures expected to reduce mortality and serious injury below that level within six months of implementation. For stocks where total human-caused mortality or serious injury, but not that attributable to commercial fisheries alone, exceeds the potential biological removal level, the take reduction plan is to include measures expected to reduce mortality and serious injury to the lowest level feasible for the fisheries within the six-month period.

Within 30 days of issuing a final stock assessment for a strategic stock, the Secretary is to establish a take reduction team. The Secretary may also form take reduction teams for other stocks for which take reduction plans will be developed. Team members must have expertise in the conservation or biology of the subject marine mammals or the fishing practices that result in incidental mortality or serious injury to the stock. Team members are to represent a diversity of interests including Federal and State agencies, Fishery Management Councils, interstate fisheries commissions, academic and scientific organizations, environmental groups, affected commercial and recreational fisheries, Alaska Native and Indian tribal organizations, and other interested groups as the Secretary deems appropriate. While the take reduction teams are not subject to the Federal Advisory Committee Act, meetings are to be open to the public.

The take reduction team is to develop a draft take reduction plan for the stock. To the extent possible, the draft plan is to be developed by consensus. Where consensus cannot be reached, the team is to advise the Secretary of the range of actions considered and provide majority and minority views.

For each strategic stock that interacts with a fishery that frequently or occasionally kills or seriously injures marine mammals and for which human-caused mortality and serious injury are believed to equal or exceed the potential biological removal level, a draft plan is to be submitted to the Secretary within six months of team establishment. Where the human-caused mortality and serious injury is less than the potential biological removal level, or for non-strategic stocks, the team is to submit a draft plan within 11 months of team establishment. If these deadlines are not met, the Secretary is to develop proposed plans independently.

Within 60 days of receiving the draft plan, the Secretary is to publish the plan in the *Federal Register*, along with any changes proposed by the Secretary, the rationale for such changes, and proposed regulations to implement the plan. No later than 60 days after the close of a public comment period of not more than 90 days, the Secretary is to publish a final take reduction plan and implementing regulations. The take reduction teams will continue to meet periodically to monitor implementation of the final take reduction plan until the objectives of the plan have been met.

If the Secretary determines that incidental mortality and serious injury of marine mammals resulting from commercial fisheries is having, or is likely to have, an immediate and significant adverse effect on a species or stock, emergency regulations are to be promulgated to reduce the level of take. Such regulations are to be developed in consultation with the Marine Mammal Commission, appropriate Fishery Management Councils, State fishery managers, and, if established, the appropriate take reduction team. Emergency regulations are to expire at the end of the applicable fishing season or at the end of 180 days, whichever is earlier. They may, however, be extended for an additional 90-day period if needed to address a continuing threat.

If a take reduction plan has been developed for the stock, emergency regulations, to the extent practicable, should be consistent with the plan. Further, the Secretary, after soliciting recommendations from the take reduction team, is to implement amendments to the plan on an expedited basis to address the identified adverse impacts. For those stocks for which a take reduction plan is in the process of being developed, the Secretary is to issue needed emergency regulations and approve and implement the plan on an expedited basis. If no take reduction plan is being developed for the stock, the Secretary, in addition to

emergency regulations, is to review the stock assessment to determine if a take reduction team should be established. In addition, if the adverse effect is on an endangered or threatened species, the Secretary may place observers on vessels engaged in fisheries that only rarely take marine mammals if the Secretary has reason to believe that such fisheries may be causing the incidental mortality and serious injury.

Section 120: Pinniped-Fisheries Interactions

New section 120 addresses interactions between pinnipeds and fishery resources. Under this provision, States may apply to the Secretary of Commerce to obtain authorization for the intentional lethal taking of pinnipeds in certain instances. Such authorization may not be granted if the pinniped stock is listed as threatened or endangered under the Endangered Species Act, is designated as depleted under the Marine Mammal Protection Act, or is determined to be a strategic stock.

If a State submits sufficient evidence to demonstrate that individually identifiable pinnipeds are having a significant impact on the decline or recovery of a salmonid stock that is listed as endangered or threatened, that is approaching endangered or threatened status, or that migrates through Seattle's Ballard Locks, the Secretary is to establish a Pinniped-Fishery Interaction Task Force to examine the problem. The Secretary is also to publish notice of the application in the *Federal Register* for public comment.

Within 60 days of its establishment, the task force, after considering public comment, is to recommend to the Secretary whether or not to approve the proposed lethal removal. If lethal removal is recommended, the task force is to include a description of the individual pinnipeds to be removed, the proposed location, time, and method of removal, criteria to be used to evaluate the success of the action, and the duration of the lethal taking authority. The task force is also to suggest any available and practicable nonlethal alternatives to address the problem. The Secretary is to take final action on the application within 30 days of receiving the task force's recommendation. Among the factors to be considered by the task force and the Secretary are (1) population trends, feeding habits, location, manner, and timing of the interaction, and numbers of pinnipeds involved; (2) past efforts at nonlethal deterrence and availability of other nonlethal alternatives; (3) the extent to which the pinnipeds are causing undue injury or impact to, or are imbalanced with, other species in the ecosystem; and (4) the extent to which the pinnipeds are exhibiting behavior that presents an ongoing threat to public safety.

The amendments also direct the Secretary to undertake further study of pinniped-fishery interactions. Section 120(f) directs the Secretary to investigate whether California sea lions and Pacific harbor seals are having significant negative impacts on the recovery of salmonid stocks that are listed under the Endangered Species Act or that are approaching endangered or threatened status. The Secretary is also to investigate the broader impacts that these pinnipeds may be having on the coastal ecosystems of Washington, Oregon, and California. The Secretary is to report on the results of these studies by 1 October 1995. The report, along with recommendations to be developed by the Secretary after discussions with the Pacific States Marine Fisheries Commission to address any identified problems, is to be made available for public review and comment and is to be provided to Congress.

Section 120(g) authorizes, but does not require, the Secretary to undertake an additional regionwide pinniped-interaction study. The study would examine at least three high predation areas along migratory corridors used by anadromous fish in the Pacific Northwest to evaluate fish behavior in the presence of predators, holding times and passage rates of anadromous fish in areas where they are vulnerable to predation, and whether facilities exist or could be developed to improve escapement.

Section 120(h) requires the Secretary to establish a Pinniped-Fishery Interaction Task Force to examine problems involving pinnipeds in the Gulf of Maine that may be interacting in a dangerous or damaging manner with aquaculture resources. The Secretary, within two years of enactment of the amendments, is required to submit to Congress a report recommending available alternatives to mitigate such interactions.

Additional Changes to the Act

During reauthorization hearings, some groups expressed concern that more explicit authority for habitat protection under the Marine Mammal Protection Act was needed. In response, the findings and policies set forth in section 2 were amended to strengthen the Act's general policy statements to call for the protection of essential habitat and to recognize the need to protect and conserve marine mammal habitat in addition to the animals themselves.

A habitat-related amendment was also added to section 112. A new subsection (e) was created to authorize the Secretary to develop and implement conservation and management measures to alleviate impacts on rookeries, mating grounds, or other areas of similar ecological

significance that may be causing the decline or impeding the recovery of a strategic stock of marine mammals. Such measures are to be developed and implemented in consultation with the Marine Mammal Commission and other appropriate Federal agencies and after notice and an opportunity for public comment.

The amendments added several new definitions to section 3. The term "harassment," an element of "taking" under the Act, was defined to include "Level A" and "Level B" harassment. Level A harassment is an act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild. Level B harassment is an act of pursuit, torment, or annoyance which has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering. The amendments define the term "*bona fide* research" to mean scientific research on marine mammals, the results of which (1) likely would be accepted for publication in a refereed scientific journal; (2) are likely to contribute to the basic knowledge of marine mammal biology or ecology; or (3) are likely to identify, evaluate, or resolve conservation problems.

Other definitions added to section 3 pertain primarily to the new incidental take regime for commercial fisheries. As noted above, attention under the new regime focuses on strategic stocks. A "strategic stock" is defined as one for which the level of direct human-caused mortality exceeds the calculated potential biological removal level, which is declining and likely to be listed as a threatened species under the Endangered Species Act within the foreseeable future, or which is already listed as endangered or threatened under the Endangered Species Act or designated as depleted under the Marine Mammal Protection Act. The term "potential biological removal level" means the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing the stock to reach its optimum sustainable population. It is calculated by multiplying the minimum population estimate of the stock, one-half the maximum theoretical or estimated net productivity rate of the stock at a small population size, and a recovery factor that will vary from 0.1 to 1.0 depending on the status of the population. The terms "Regional Fishery Management Council," "Alaska Native organization," "take reduction plan," "take reduction team," "net productivity rate," and "minimum population estimate" were also defined.

Section 101(a) of the Act establishes and sets forth several exceptions to the general moratorium on taking and importing marine mammals. The amendments modified some of the existing exceptions and added several new ones. Authority was added for the issuance of two new types of permits, applicable to educational or commercial photography and to the importation of polar bear trophies taken in the sport hunt authorized by Canada.

Former section 101(a)(4), which provided a streamlined mechanism for authorizing the taking of small numbers of non-depleted marine mammals incidental to commercial fishing operations, was deleted and replaced with a new provision authorizing certain actions to deter marine mammals from damaging property or endangering personal safety. Under new section 101(a)(4), measures that do not result in the death or serious injury of a marine mammal and that comport with guidelines issued by the Secretary may be taken by (1) fishermen to deter a marine mammal from damaging their gear or catch; (2) the owner of private property or the agent of the owner to deter a marine mammal from damaging that property; (3) any person to deter a marine mammal from endangering personal safety; or (4) by a government employee to deter a marine mammal from damaging public property.

The Secretary, in consultation with appropriate experts, is required to publish guidelines setting forth the measures that may be taken to deter marine mammals. For species listed as threatened or endangered under the Endangered Species Act, the Secretary is required to specify nonlethal deterrence measures that may be used. The Secretary is also authorized to prohibit, through issuance of regulations, any form of deterrence that is determined to have a significant adverse effect on marine mammals. Taking in accordance with the guidelines or specific measures will not constitute a violation of the Act. Depending on how the specific measures for listed species are crafted, however, such taking may be a violation of the Endangered Species Act.

Two new subparagraphs were added to section 101(a)(5), the Act's remaining small take provision. Subparagraph (D) provides a streamlined mechanism for authorizing the take of small numbers of marine mammals incidental to activities other than commercial fishing, when only taking by harassment is expected. Such authorizations are to be issued for periods of up to one year if the Secretary determines, after notice and opportunity for public comment, that such taking will have a negligible impact on the marine mammal species or stock and will not have unmitigable adverse impacts on the availability of the marine mammals for subsistence by Alaska Natives. The authorization of incidental taking other than by harassment

will remain subject to the rulemaking requirement of section 101(a)(5)(A).

New section 101(a)(5)(E) enables the Secretary to allow the taking of marine mammals listed as threatened or endangered under the Endangered Species Act incidental to commercial fishing under certain circumstances. Such authorizations are limited to a three year period and apply only to vessels of the United States or foreign vessels permitted to fish under section 204(b) of the Magnuson Fishery Conservation and Management Act. The taking of California sea otters may not be authorized under this provision. Rather, such takings will remain subject to the requirements of public Law 99-625.

Before issuing an authorization under section 101(a)(5)(E), the Secretary must determine, after notice and opportunity for public comment, that (1) the incidental mortality and serious injury from commercial fisheries will have a negligible impact on the species or stocks; (2) a recovery plan has been, or is being, developed for the species or stock under the Endangered Species Act; and (3) where required under the new incidental take regime for commercial fisheries (section 118), a monitoring program has been established, the vessels are registered, and a take reduction plan has been, or is being, developed. If the required determinations are made, the Secretary is to publish a list of the fisheries to which the authorization applies and, for vessels required to register under section 118, issue appropriate permits. Vessels participating in fisheries included in the list, but which are not required to register, are covered by the authorization provided that they report any such incidental mortality or serious injury. It is expected that the taking of listed species will also be authorized under an incidental take statement issued in accordance with section 7(b)(4) of the Endangered Species Act.

The amendments also added a new paragraph (6) to section 101(a) to allow the importation of marine mammal products in some instances. United States citizens may return to the United States with items containing marine mammal parts provided that the person legally possessed the item and exported it from the United States in conjunction with foreign travel. This exception would allow, for example, a citizen to take a pair of sealskin mukluks on an overseas trip without facing forfeiture of the item upon their return. It is not yet clear how such exports and imports will be tracked or whether certification of the item prior to export will be required.

New section 101(a)(6) also authorizes an Indian, Aleut, or Eskimo residing in Alaska to import marine mammal products acquired outside the United States as part of a cultural exchange with a Native inhabitant of Russia, Canada, or Greenland. Similarly, marine mammal products owned by Native inhabitants of Russia, Canada, or Greenland may be imported into the United States for noncommercial purposes in conjunction with travel within the United States or as part of a cultural exchange with Alaska Natives.

It should be noted, however, that the provisions of other laws and treaties, *e.g.* the Endangered Species Act and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), would still be applicable to some imports authorized under section 101(a)(6). That is, to import (or export) items containing parts from endangered or threatened species or species listed on the CITES appendices, additional authorization would be necessary.

Section 101(c) was also amended, adding another exception to the moratorium on taking marine mammals. This provision authorizes the taking of a marine mammal when "imminently necessary" in self-defense or to save the life of another person in immediate danger. Any such taking must be reported to the Secretary within 48 hours and the Secretary may seize and dispose of the carcass.

Section 101(b), the exemption allowing Alaska Natives to take marine mammals for subsistence and handicraft purposes, was also amended. As amended, the Secretary is required to meet a heightened evidentiary standard for certain actions or findings affecting species taken by Alaska Natives. Such actions must be supported by "substantial evidence" rather than just meet the "reasonableness" standard applicable to most other actions under the Act. For example, a court reviewing a Native challenge of a depletion determination made by the Secretary with respect to a stock taken for subsistence would examine the rulemaking record to determine if there were substantial scientific evidence to support the finding.

Amendments to section 102, which sets forth the Act's prohibitions, were also enacted. Section 102(a)(4) was amended to make the unauthorized export or attempted export of a marine mammal or marine mammal product a violation of the Act. This section was further amended to make the prohibition on transporting, purchasing, selling, exporting, or attempting to engage in such activities, applicable if the marine mammal or marine mammal product were taken in violation of the Act or were for any purpose other than public display, scientific research, or enhancing the survival of a species or stock authorized under section 104(c).

The amendments included several changes to the Act's permit provisions sought by the public display industry and the scientific research community. An amendment to section 104(c)(1) resolved the issue of whether the Marine Mammal Protection Act confers authority for the Secretary to supplement the care and maintenance requirements established by the Animal and Plant Health Inspection Service under the Animal Welfare Act. Under the amendment, the Secretary may continue to impose permit conditions pertaining to the methods of capture, supervision, care, and transportation as they apply to the authorized taking or importation, but may not impose additional conditions once the taking or importation has been accomplished. That is, permits issued by the Secretary may specify how a collector is to hold and care for marine mammals at the capture location but may no longer include conditions regarding the care or use of marine mammals once they are housed in the captive facility. For example, the Secretary is no longer authorized to limit the use of captive marine mammals in interactive public display programs such as swim-with-the-dolphin programs. Such use, however, could be limited by the Animal and Plant Health Inspection Service under the Animal Welfare Act.

Section 104(c)(2) sets forth the new requirements applicable to public display permits. In addition to considering the effect of the taking or importation on wild populations and ensuring that the manner of taking or importation is humane, the Secretary must determine that the permit applicant (1) offers an education or conservation program based on professionally recognized standards of the public display community; (2) is registered or licensed under the Animal Welfare Act; and (3) maintains facilities that are open to the public on a regularly scheduled basis. The amendments specify that a public display permit will grant the permittee, without any additional authorization, the right to take, import, purchase, offer to purchase, possess, or transport the marine mammals covered by the permit and to sell, export, or otherwise transfer possession of the marine mammals to another person who meets the requirements for a public display, scientific research, or species enhancement permit. Recipients of transferred marine mammals will have the same rights and responsibilities as the original permittee. Anyone selling, purchasing, exporting, or transporting a marine mammal under this provision must notify the Secretary at least 15 days before taking such action.

If the Secretary (1) finds that a facility no longer satisfies the requirements pertaining to education or conservation programs or public accessibility and is not reasonably likely to meet those requirements in the near future, or, (2) with the concurrence of the Secretary of Agriculture, finds that a facility no longer meets the registration or licensing requirements established pursuant to the Animal Welfare Act, and is not reasonably likely to meet those requirements in the near future, the Secretary may take steps to revoke the applicable permit as provided in section 104(e), seize the animals, and provide for their disposition. The Secretary is authorized to recover costs from the noncompliant facility incurred as a result of any such seizure. The Secretary is also authorized to use the Marine Mammal Unusual Mortality Event Fund established under section 405 of the Act to provide for the care and maintenance of seized marine mammals.

Two other amendments, while applicable to scientific research and enhancement permits as well as public display permits, were added primarily because of concerns about marine mammals maintained for public display. New section 104(c)(9) specifies that no marine mammal may be exported for the purpose of public display, scientific research, or enhancing the survival or recovery of a species or stock, unless the receiving facility meets standards that are comparable to those applicable to U.S. facilities. New section 104(c)(10) directs the Secretary to establish and maintain an inventory of all marine mammals possessed under permits issued under section 104 and the progeny of all such marine mammals. The inventory is to contain information regarding the name or identification of the animal; the sex of the marine mammal; its actual or estimated date of birth; the date of acquisition or disposition of the animal by the permittee; the source of the animal, including the capture location if the animal was obtained from the wild; the name of the recipient of any transferred marine mammal; a notation as to whether the animal was obtained as the result of a stranding; and the date and cause of death for any mortalities to marine mammals included on the inventory.

In response to concerns from many researchers that the process for issuing scientific research permits was unnecessarily complex and cumbersome, two amendments to section 104(c)(3) were enacted. Greater flexibility was added to the process by allowing the Secretary to issue permits before the end of the otherwise required 30-day public review and comment period when such delay could result in injury to a species, stock, or individual marine mammal, or in the loss of unique research opportunities.

As discussed above, a definition of harassment was added to the Act, differentiating between harassment which has the potential to disturb a marine mammal and that which has the potential to injure a marine mammal or marine mammal stock. The amendments direct the Secretary, within 120 days of enactment, to issue a general

authorization and implementing regulations allowing *bona fide* scientific research that may result only in taking by Level B harassment (*i.e.*, harassment that may disturb, but not injure a marine mammal). It is expected that research such as aerial surveys and photo-identification studies will be conducted under the general authorization.

To be included under the general authorization, a qualifying researcher must, no later than 60 days before the start of the research, submit a letter of intent by certified mail to the Secretary indicating (1) the species or stocks that may be harassed, (2) the geographic location of the research, (3) the period of time during which the research will be conducted, (4) the purpose of the research, along with an explanation of why the research is considered to be *bona fide*, and (5) the methods that will be used to conduct the research. Within 30 days of receiving a letter of intent, the Secretary is required to issue a letter to the applicant confirming that the general authorization applies or, if the Secretary believes that the research is likely to result in taking other than by Level B harassment, that a permit must be obtained.

As noted above, the amendments added a new permitting authority under which polar bear trophies may be imported from Canada. Import permits for polar bear parts (other than internal organs) from bears legally taken in the Canadian sport hunt, including bears taken prior to enactment of the 1994 amendments, may be issued if the Secretary of the Interior, in consultation with the Marine Mammal Commission, determines that (1) Canada has a monitored and enforced sport hunting program consistent with the purposes of the Agreement on the Conservation of Polar Bears, (2) the Canadian sport hunting program is based on scientifically sound quotas that ensure the maintenance of the affected population stock at a sustainable level, (3) the export from Canada and import into the United States are consistent with the Convention on International Trade in Endangered Species of Wild Fauna and Flora and other international agreements and conventions, and (4) the export and subsequent import are not likely to contribute to illegal trade in bear parts. The Secretary is directed to charge a reasonable fee for the issuance of polar bear import permits to be used for developing and implementing cooperative research and management programs for the conservation of polar bears in Alaska and Russia.

The Secretary is further directed to undertake a scientific review of the impact of issuing import permits on the polar bear populations in Canada. The review is to be subject to public review and comment and is to be completed by 30 April 1996. No permits authorizing the importation of polar bear trophies from Canada may be issued after 30 September 1996 if the review indicates that the issuance of such permits is having a significant adverse effect on Canadian polar bear stocks.

The amendments also added a new permit category allowing the Secretary to issue permits for educational or commercial photography. Applicants for such permits must demonstrate that any taking will be limited to Level B harassment and must indicate the manner in which the films, photographs, or videotapes will be made available to the public.

Section 110 of the Act provides for marine mammal research grants. Section 110(c) was amended to require the Secretary of Commerce to convene a regional workshop to assess human-caused factors affecting the health and stability of the Gulf of Maine marine ecosystem. Its goals are to identify such factors and to recommend a research and management program designed to restore or maintain the ecosystem. The workshop is to be conducted in consultation with the Marine Mammal Commission, adjacent coastal States, environmental organizations, the fishing industry, and other appropriate groups and individuals. A report of the workshop results, along with proposed regulatory or research actions and any recommended legislative action, is to be submitted to Congress by 31 December 1995.

Section 110(d) was added to require the Secretary of Commerce, in consultation with the Secretary of the Interior, the Marine Mammal Commission, the State of Alaska, and Alaska Native organizations, within 180 days of enactment, to undertake a research program to monitor the health and stability of the Bering Sea marine ecosystem and to resolve uncertainties concerning the causes of observed declines in populations of marine mammals, sea birds, and other living resources. In designing the research program, the Secretary is to make use of recommendations made by previous workshops on Bering Sea living marine resources. The Secretary of Commerce, the Secretary of the Interior, and the Marine Mammal Commission are to include discussions of the status and findings of this research program in their annual reports to Congress.

In response to concerns that the Agreement on the Conservation of Polar Bears may not have been fully implemented by the United States and other parties, Congress amended section 113 to require the Secretary of the Interior to initiate two reviews. Section 113(b) requires the Secretary, in consultation with the contracting parties, to review the effectiveness of the Agreement. The review is to be initiated within one year of enactment of the new provision. Also, the Secretary is to work with the contract-

ing parties to establish a process by which future reviews of the Agreement will be conducted.

As to domestic implementation of the Polar Bear Agreement, the amendments require the Secretary, in consultation with the Secretary of State and the Marine Mammal Commission, to review the effectiveness of U.S. implementation, particularly with respect to the habitat protection mandates of the Agreement. A report on the results of that review is to be submitted to Congress by 1 April 1995. In addition, the amendments call on the Secretary, acting through the Secretary of State and in consultation with the Marine Mammal Commission and the State of Alaska, to consult with appropriate officials in the Russian Federation to develop and implement enhanced cooperative research and management programs for conserving polar bears in Alaska and Russia. A report on the consultations and periodic progress reports on research and management actions taken under this provision are to be provided to Congress.

Section 115(b) of the Act, which requires the Secretary to prepare conservation plans for depleted marine mammal stocks, was also amended. New paragraph (4) provides that, when applicable, conservation plans incorporate the requirements of take reduction plans developed under section 118.

The amendments reauthorized appropriations for a six-year period to enable the Department of Commerce, the Department of the Interior, and the Marine Mammal Commission to carry out their responsibilities under the Act. General appropriations authorized by section 116(a) for the Department of Commerce increase from $12,138,000 in fiscal year 1994 to $14,768,000 in fiscal year 1999. The amendments also authorize an additional appropriation of $20 million to the Department of Commerce for each fiscal year from 1994 through 1999 to carry out the requirements of the sections 117 and 118, the new fisheries incidental take regime. Appropriations for the Department of the Interior authorized by section 116(b) range from $8,000,000 in fiscal year 1994 to $10,296,000 in fiscal year 1999. Authorized appropriations for the Marine Mammal Commission under section 207 go from $1,500,000 in fiscal year 1994 to $1,750,000 in fiscal year 1999.

Section 119 was added to the Act to authorize funding for and to encourage development of cooperative agreements between the Secretary and Alaska Native organizations designed to conserve marine mammals and provide co-management of subsistence use by Alaska Natives. Under such agreements, the Secretary may make grants to Alaska Native organizations for, among other purposes, collecting and analyzing data on marine mammal populations, monitoring the taking of marine mammals for subsistence purposes, participating in marine mammal research, and developing marine mammal co-management programs with Federal and State agencies. Supplemental appropriations of $1.5 million per year for the Department of Commerce and $1.0 million per year for the Department of the Interior are authorized for establishing such agreements and providing such grants. Addition of section 119 was not intended to change the existing jurisdiction of Federal, State, or tribal governments over fish and wildlife resources.

The amendments also made various technical amendments to the Marine Mammal Protection Act. Most notably, the provisions of the Marine Mammal Health and Stranding Response Act were redesignated as sections 401 through 409, under a new title IV. This revision was needed to eliminate any confusion between this Act and the International Dolphin Conservation Act of 1992, both of which were originally enacted as title III of the Marine Mammal Protection Act.

Other provisions of the Marine Mammal Protection Act Amendments of 1994 did not amend the Marine Mammal Protection Act, but were enacted as free-standing provisions. Section 14 of the Public Law provides that nothing in the amendments alters or is intended to alter any treaty between the United States and Indian tribes or the Act's exemption for Alaska Natives (section 101(b)). Section 15(b) of the Public Law requires that, except as otherwise indicated, regulations to implement the amendments are to be promulgated by 1 January 1995. Section 17 of the Public Law negates the regulatory provisions applicable to humpback whale cow/calf waters in Hawaii (50 C.F.R. § 222.31(b)). Section 18 of the Public Law extends for five years certificates of exemption issued under the Endangered Species Act that authorize the possession and sale of pre-Act scrimshaw products or raw materials for making such products.