

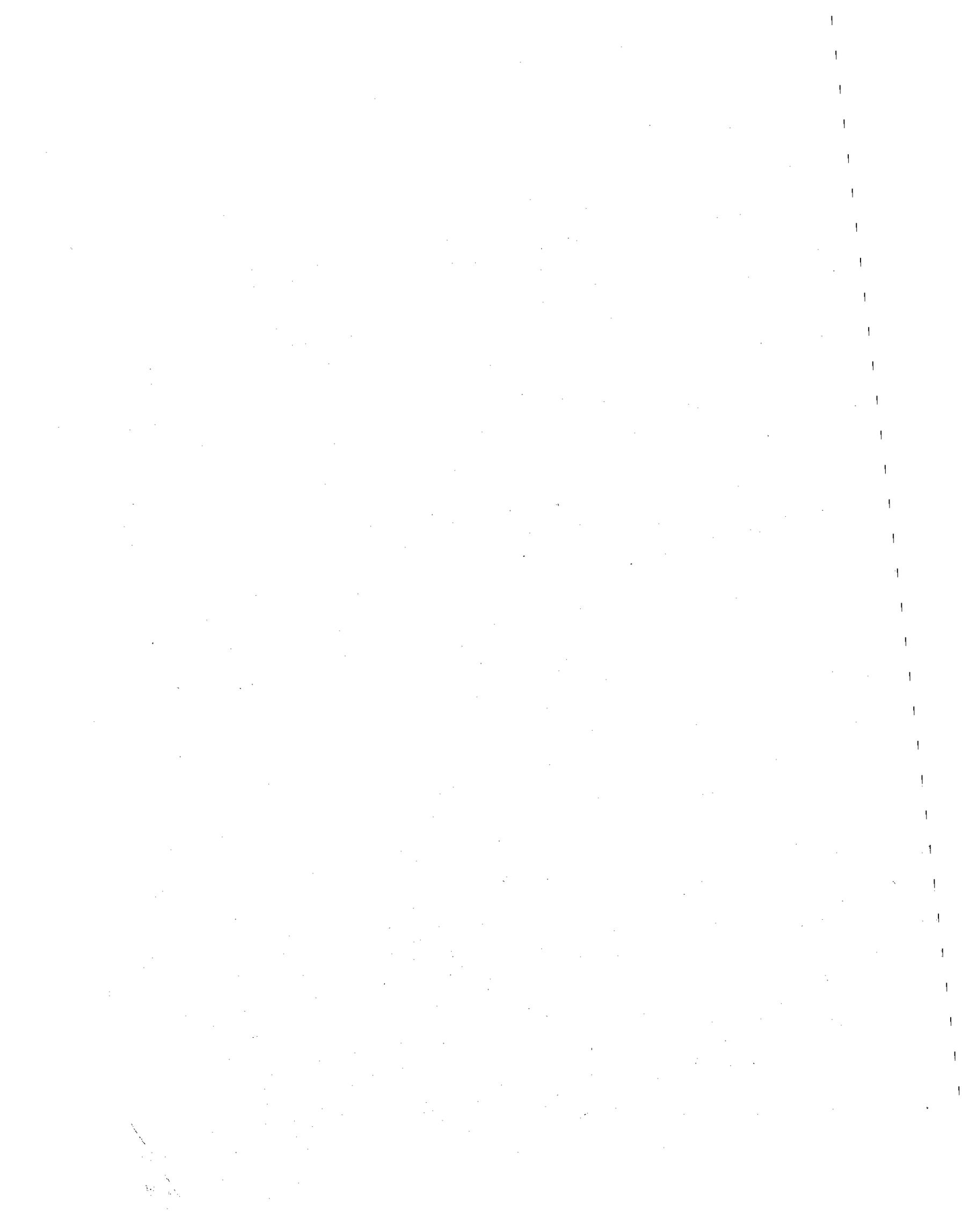
MARINE MAMMAL COMMISSION

Annual Report to Congress

1999

**Marine Mammal Commission
4340 East-West Highway, Room 905
Bethesda, Maryland 20814**

31 January 2000



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EXECUTIVE SUMMARY

This is the 27th Annual Report of the Marine Mammal Commission and its Committee of Scientific Advisors on Marine Mammals. The Commission was established under Title II of the Marine Mammal Protection Act of 1972 to provide an independent source of policy and program guidance to Congress and the Executive Branch on domestic and international issues affecting marine mammal conservation.

The purpose of this report is to provide timely information on management-related issues and events to Congress, federal and state agencies, public interest groups, the academic community, private citizens, and the international community. When combined with previous annual reports, it provides a record of the evolution and progress of U.S. policies and programs to conserve marine mammals and their habitats. To ensure accuracy, drafts of the report were reviewed by involved federal and state agencies and knowledgeable individuals. The following highlights some of the issues and programs addressed by the Commission in 1999.

Introduction (Chapter I)

Chapter I briefly reviews the structure of the Commission. It notes that the Commission consists of three members who are required by statute to be knowledgeable in marine ecology and resource management, that they are appointed by the President with the advice and consent of the Senate, and that the Commission is advised by a statutorily established nine-member Committee of Scientific Advisors who are required by statute to be knowledgeable in marine ecology and marine mammal affairs. Committee members are appointed by the Chairman of the Commission in consultation with the other two Commissioners. Members of the Commission, the Committee, and the staff are listed in Chapter I. For fiscal years 1999 and 2000, the Commission was appropriated \$1,240,000 and \$1,265,000, respectively.

Reauthorization of the Marine Mammal Protection Act (Chapter II)

To begin the process of reauthorizing the Act for the fiscal years beyond 1999, the Subcommittee on Fisheries Conservation, Wildlife, and Oceans of the House Resources Committee held a hearing on 29 June 1999 to examine the implementation of amendments enacted in 1994 and to identify matters appropriate for possible further amendment. The Commission and other responsible federal agencies participated in the hearing. The Commission's statement concerning implementation of the 1994 amendments and its recommendations for additional legislation are addressed in this chapter and in Appendix D.

Species of Special Concern (Chapter III)

Each year the Commission and its Committee of Scientific Advisors focus attention on marine mammal species and populations facing particular conservation challenges. In 1999 these

included, among others, northern right whales, Hawaiian monk seals, California sea otters, and Florida manatees.

Northern Right Whales — The northern right whale is the most endangered marine mammal in U.S. waters and the most endangered species of large whale in the world. Its largest known population, about 300 to 325 animals, occurs off the east coasts of the United States and Canada. Half of the population's known mortality is caused by collisions with ships and entanglement in fishing gear. In 1999 there were two known deaths — one due to a ship strike and the other due to entanglement in fishing gear. At least five other whales also were observed entangled in fishing gear. Although counts of calves since the early 1980s have averaged about 11 per year, only 4 were seen in 1999, the lowest number since monitoring began.

To reduce the chances of collisions with ships, the National Marine Fisheries Service and the Coast Guard, with help from the Marine Mammal Commission, developed mandatory ship reporting systems approved by the International Maritime Organization for right whale feeding areas off Massachusetts and calving grounds off Florida and Georgia. The systems, which became effective on 1 July 1999, require all large ships entering the area to contact a shore station for information on recent right whale sighting locations and advisories on the need for special precautions to avoid whales. To mitigate the effects of entanglement in gillnets and lines from lobster pots, the National Marine Fisheries Service adopted a take reduction plan in 1998 that includes steps to (1) disentangle right whales, (2) design fishing gear less likely to entangle whales, and (3) regulate fishing in right whale critical habitats. Because several whales were entangled and one died despite plan provisions, the Marine Mammal Commission recommended further protective steps discussed in this chapter.

In light of inadequate funding for right whale recovery work, Senators Judd Gregg and Ted Stevens took the lead in encouraging Congress to appropriate \$4.1 million to the Service for right whale research and management activities and the start-up of the National Whale Conservation Fund within the National Fish and Wildlife Foundation, a fund to support research and management work on whales, particularly highly endangered species such as the northern right whale.

Hawaiian Monk Seals — Hawaiian monk seals are the most endangered seals in U.S. waters. Limited primarily to the remote Northwestern Hawaiian Islands, they number about 1,300 to 1,400 animals. The species' abundance declined by about 50 percent between the late 1950s and the late 1970s. Since the late 1980s, the decline has been extended by a 50 percent decline at the species' largest breeding colony, the one at French Frigate Shoals. High juvenile mortality at that site appears to be due, at least in part, to limited prey availability, although shark predation and aggressive behavior by adult males also have contributed. Among the principal human-related threats are entanglement in derelict fishing nets, disturbance at pupping and haul-out beaches, and depletion of prey resources by commercial fisheries.

The decline at French Frigate Shoals, which began soon after a commercial lobster fishery was started in the Northwestern Hawaiian Islands, is discussed in this chapter, as are

Commission recommendations that the National Marine Fisheries Service fund research to resolve questions about the importance of lobsters in monk seal diets and, as a precautionary measure, that it close French Frigate Shoals to lobster fishing pending the results of the research. Although the Service provided some funding for the recommended studies, it repeatedly rejected recommendations to prohibit lobster fishing at French Frigate Shoals and in 1999 it adopted new management measures that effectively shifted lobster fishing effort to major monk seal breeding atolls. The Commission again recommended closing the lobster fishery at French Frigate Shoals and other major monk seal pupping atolls pending further research. The Service again declined to institute the closures. Preliminary research findings late in 1999 suggested that lobsters are important prey for juvenile and female monk seals, and the Service indicated it would reexamine the Commission's recommendations in 2000.

During 1999 the National Marine Fisheries Service expanded cooperative efforts with other agencies and groups to remove net debris from reefs adjacent to monk seal breeding atolls. The debris, apparently drifting in from remote North Pacific fishing grounds, poses a serious threat of entanglement for monk seals. As a result, the State Department asked U.S. embassies in fishing nations bordering the western North Pacific to bring to the attention of appropriate government officials the importance of there being effective measures in place to prevent the discard and loss of fishing gear and other marine debris.

Sea Otters — Sea otters were driven to near-extinction throughout their range in the North Pacific by commercial hunting that began shortly after the Russian discovery of Alaska in 1741. Small groups of animals survived in remote locations and, since commercial hunting was prohibited in 1911, they have recolonized or been reintroduced into much of their former range. The remnant population that survived along the isolated Big Sur coast of California grew from about 50 animals in the 1930s to approximately 1,000 in the 1970s when the Marine Mammal Protection Act and the Endangered Species Act were enacted. Because of its small size, limited distribution, and susceptibility to the threat of oil spills, the California population was designated as threatened in 1977. The desirability of establishing at least one colony outside the then-existing range to prevent an oil spill from jeopardizing the entire population, while at the same time regulating range expansion to minimize impacts on fisheries for invertebrates commonly eaten by sea otters, were key elements in the Southern Sea Otter Recovery Plan adopted by the Fish and Wildlife Service in 1982. To enable the plan to be implemented, Congress passed Public Law 99-625 in 1986 and the Fish and Wildlife Service subsequently developed regulations to govern establishment of a reserve sea otter colony offshore California. Between August 1987 and July 1990, 139 sea otters were captured in the mainland range and moved to San Nicolas Island.

The colony has not grown as expected, the mainland population appears to have declined since 1995, and in the last two years large numbers of otters have moved in and out of the designated "no otter" management zone south of Point Conception. In response, the Fish and Wildlife Service announced in March 1999 that it was considering declaring the translocation a failure and abandoning the concept of zonal management. These actions are controversial and, at its annual meeting in October 1999, the Commission sought information and views concerning

the status of the population and possible management alternatives. During the meeting the Commission was advised that the Fish and Wildlife Service did not expect to complete and begin implementing an update of its recovery plan for this population before mid-2000. The Commission believed that certain actions should be undertaken more quickly, and on 23 December 1999 it forwarded to the Service a draft action plan for immediate consideration. The draft plan identified 12 tasks that the Commission and its Committee of Scientific Advisors believe should be given prompt attention to promote recovery of the population and to identify the optimal long-term conservation strategy. The Service is expected to respond to the draft action plan early in 2000.

Florida Manatees — The Florida manatee, a subspecies of the West Indian manatee found only in the southeastern United States, is one of the nation's most endangered marine mammals. The population, numbering at least 2,800 animals, appears to have grown in size since the mid-1970s. However, 274 dead manatees were found in 1999 — the second highest annual total since recordkeeping began in the mid-1970s. Boat strikes were the leading cause of human-related manatee deaths, with a record high of 83 deaths. In 1999 the State of Florida completed what has been a 10-year process to establish boat speed regulations in 13 key manatee counties. Because boater compliance with the new rules has been poor in most areas, the effectiveness of the new rules remains unclear. The Fish and Wildlife Service, with help from the Coast Guard, took steps to strengthen law enforcement in 1999 and a special appropriation to the Service to further increase law enforcement was provided by Congress for fiscal year 2000.

To avoid cold temperatures during winter, most Florida manatees use warm-water refuges formed by power plant outfalls and natural springs in central and southern Florida. In recent winters the number of animals using these sites has increased, with up to 585 animals counted at one power plant. Such concentrations increase the risk of large-scale die-offs due to red tides, pollution events, or exposure to cold if a power plant shuts down. Recent interest in deregulating Florida's electric utilities has raised the possibility that some power plant outfalls used by manatees may be eliminated. To address this situation, the Fish and Wildlife Service, in consultation with the Commission and other agencies, convened a workshop in August 1999 to begin developing a long-term strategy for managing warm-water refuges. Among other things, participants considered a Commission suggestion for investigating the development of a network of non-industry dependent artificial refuges within the population's core winter range. Results of the workshop are being considered by the Florida Manatee Recovery Team, which began efforts in 1999 to update the Florida Manatee Recovery Plan.

Marine Mammal-Fisheries Interactions (Chapter IV)

Marine mammals and fisheries interact in ways that can affect both adversely. Marine mammals may be entangled and killed or injured in fishing gear. Also, marine mammals may take or damage caught fish, compete with fishermen for the same fishery resources and, if entangled, may damage or destroy gear.

The Marine Mammal Protection Act was amended in 1994 to establish a new regime for governing the taking of marine mammals incidental to commercial fishing operations. This chapter discusses actions taken to implement that regime, including the preparation of assessment reports for marine mammal stocks that occur in U.S. waters, the annual listing of all U.S. fisheries according to the frequency with which they take marine mammals, and the establishment of take reduction teams composed of scientists and representatives of the affected fisheries and other interest groups to advise the National Marine Fisheries Service on the development of take reduction plans for strategic stocks. A strategic stock is one listed as endangered or threatened under the Endangered Species Act, designated as depleted under the Marine Mammal Protection Act, or for which human-caused mortality and serious injury exceed the potential biological removal level calculated for the stock. Based on the recommendations of the take reduction teams, the Service is to complete and implement take-reduction plans designed to reduce the levels of take to below certain levels within specified time periods.

The death of large numbers of dolphins in the eastern tropical Pacific tuna fishery was one of the issues that played a key role in enactment of the Marine Mammal Protection Act in 1972. At that time, hundreds of thousands of dolphins were being killed every year. Since that time, annual mortality has declined considerably and, although a final estimate for 1999 is not yet available, it is expected to be less than 1,500 dolphins, a record low number. In 1997 the Marine Mammal Protection Act was amended to recognize international efforts to reduce dolphin mortality through the establishment of the International Dolphin Conservation Program. The 1997 amendments require the National Marine Fisheries Service, in consultation with the Marine Mammal Commission, to conduct research on the effects of chasing and encircling dolphins in the course of setting purse seine nets around tuna. Based on whether that research indicates that chase and encirclement are having significant adverse effects on any depleted dolphin stock, the requirements for labeling tuna as "dolphin-safe" may change. The National Marine Fisheries Service issued an initial finding in April 1999 that, although depleted dolphin stocks did not appear to be growing as expected, there was insufficient evidence to conclude that this was attributable to chase and encirclement by tuna vessels. This chapter discusses the research on which the initial finding was based, the consultative role of the Commission concerning the research program, and actions taken by the Service to promulgate regulations to implement the provisions of the 1997 amendments.

Growing populations of seals and sea lions may be affecting the recovery of salmon stocks at certain locations along the west coast of the United States. On the east coast, in the Gulf of Maine, seals may enter fish pens and eat salmon being raised in aquaculture operations. Recognizing the potential conflicts between growing pinniped populations and fisheries, Congress amended the Marine Mammal Protection Act in 1994 to allow states to obtain lethal-take authority to protect certain depleted salmonid stocks. To date, Washington is the only state that has requested and obtained such authority. The 1994 amendments also directed the National Marine Fisheries Service to assess and submit reports on pinniped-fishery interactions along the west coast and in the Gulf of Maine aquaculture industry. Those reports, as well as the consideration of pinniped-fisheries interaction problems at the Commission's 1999 annual meeting, are discussed in this chapter.

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

The Marine Mammal Protection Act directs the Commission, in consultation with its Committee of Scientific Advisors, to undertake a continuing review of, and to advise the Secretary of State and other federal officials on, measures necessary to conserve marine mammals and their habitats internationally, as well as domestically. During 1999 the Commission participated in efforts to develop U.S. positions on several international conservation regimes, including those related to whaling, the protection of Arctic and Antarctic resources, and international trade in protected species. Other activities with respect to individual species are discussed in Chapter III.

The International Whaling Commission — The International Whaling Commission (IWC) is the international body responsible for regulating whaling. Because its management program had proven ineffective in conserving whale stocks, the IWC adopted a moratorium on commercial whaling, which has been in effect since 1986. Some types of whaling continue to occur, including commercial whaling by Norway under an objection to the moratorium, and scientific whaling by Japan in the Southern Ocean and the North Pacific. In addition, aboriginal subsistence whaling is authorized in certain instances. Quotas adopted in 1997 allowing the taking of bowhead and gray whales by Natives in Alaska and Washington remain in effect.

During 1999 the IWC continued its work to develop a Revised Management Scheme under which commercial whaling might be resumed. Although a revised management procedure, under which allowable catch levels would be established, has been agreed to, the IWC members have yet to agree to other aspects including a system of monitoring and enforcement to ensure compliance with catch limits and other conservation measures it may adopt. At its 1999 meeting the IWC adopted a resolution calling on its Scientific Committee to report on the use of DNA testing as a possible way to identify and track whale products. Other actions taken at the 1999 IWC meeting are also discussed in this chapter.

In 1999 the Commission worked with the National Oceanic and Atmospheric Administration in developing U.S. positions on issues before the IWC. Also, the Commission provided copies of the report from its Workshop on Marine Mammals and Persistent Ocean Contaminants to the IWC's Scientific Committee to assist in the review of environmental effects on whales.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora — This Convention, commonly known as CITES, provides an international framework for regulating trade in species that are or may become threatened with extinction. The level of protection afforded a species depends on its listing on one of three appendices. This section discusses preparations for the next Conference of Parties to be held in Kenya in April 2000. Among other things, the parties are expected to consider proposals to downlist four whale stocks from Appendix I to Appendix II, move the Black Sea stock of bottlenose dolphins from Appendix II to Appendix I, and transfer the Australian population of dugongs from Appendix

II to Appendix I. This section also discusses actions taken by the Commission and others to oppose the planned sale and export of meat and blubber from beluga whales, an Appendix II species, from Russia to Japan.

Conservation of Marine Mammals and their Habitats in the Southern Ocean — Six species of large whales, six species of seals, and nine species of dolphins and porpoises live seasonally or year-round in the seas surrounding Antarctica. These species can be affected directly and indirectly by fisheries, tourism, and science-related activities in the Southern Ocean and adjacent areas. Therefore, the Commission, in consultation with its Committee of Scientific Advisors, conducts a continuing review of such activities and works with other agencies to identify and promote needed conservation measures. This chapter describes the principal results of the second meeting of the Committee for Environmental Protection and the 23rd Antarctic Treaty Consultative Meeting held in Lima, Peru, from 24 May through 4 June 1999, and the meetings of the Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources held in Hobart, Australia, from 25 October through 5 November 1999. It also describes environmental assessments for nongovernmental activities carried out in 1999 in response to regulations promulgated by the Environmental Protection Agency and marine mammal-related research conducted or supported in 1999 by the National Marine Fisheries Service and the National Science Foundation. The most important outcome of actions in 1999 was the adoption by the Commission on the Conservation of Antarctic Marine Living Resources of a catch documentation and tracking scheme for Patagonian toothfish, marketed in the United States as Chilean sea bass.

The Arctic Council — Many species of marine mammals live seasonally or year-round in the Arctic. They are integral components of the Arctic marine ecosystem and important to the cultures and subsistence economies of Alaska Native communities. Because the ranges of most of these species cross international boundaries, effective conservation of their populations and habitats requires cooperation among Arctic nations. In June 1991 the eight Arctic countries (Canada, Denmark for Greenland, Finland, Iceland, Norway, the Soviet Union, Sweden, and the United States) adopted and began implementing a cooperative strategy - the Arctic Environmental Protection Strategy - to protect environmental quality and conserve natural resources of the Arctic. In September 1996 these nations established the Arctic Council to provide a high-level forum to oversee and coordinate efforts to protect the Arctic environment and promote sustainable development and utilization of Arctic resources. At its first meeting, in September 1998, the Council adopted rules of procedure and terms of reference for the sustainable development program. Following that meeting the United States assumed the chair and secretarial functions of the Council through its next meeting, scheduled for October 2000. In 1999 senior Arctic officials and the sustainable development working group met in Alaska and in Washington, DC, to overview ongoing activities and begin preparations for the Council meeting in October 2000. U.S. participation in the Arctic Council and its subsidiary bodies is coordinated by an interagency Arctic Policy Group, chaired by the Department of State. Commission representatives participate in the meetings of the Arctic Council and its subsidiary bodies where issues related to the conservation of marine mammals and their habitat are considered. Activities of the Arctic Council and its subsidiary working groups,

recommendations by the Commission, and steps taken by the Department of State and other involved agencies and groups to identify and promote priority activities during 1999 are described in this chapter.

Marine Mammal Mortality Events (Chapter VI)

Unusual marine mammal mortality events appear to have become more common in the United States and elsewhere over the past 25 years. In 1999 there were three unusual mortality events that occurred wholly or partially in areas under U.S. jurisdiction. They were (1) the deaths of at least 216 harbor porpoises along the U.S. east coast (from Massachusetts to North Carolina) in the first five months of the year — more than twice the previous high for this period; (2) the deaths of at least 273 gray whales, three times the previous high, along the west coast (from Baja California to Alaska) between the first of January and the first of October; and (3) the deaths of at least 87 bottlenose dolphins along the Florida panhandle from September through December, more than eight times the previous high for this period. Many of the harbor porpoise deaths appeared to have been caused by entanglement in fishing gear. The cause or causes of the gray whale deaths have not been determined but may have been food-related. The bottlenose dolphin deaths appear to have been caused by toxic algal blooms.

As noted in previous Commission reports, the deaths of more than 700 bottlenose dolphins along the east coast in 1987 led to passage in 1992 of the Marine Mammal Health and Stranding Response Act (Title IV of the Marine Mammal Protection Act). Among other things, this legislation directed the National Marine Fisheries Service, in consultation with the Commission and the Fish and Wildlife Service, to establish both a contingency plan for responding to unusual mortality events and an expert working group to advise on criteria and procedures for identifying and responding to unusual events. Although the Service has made substantial progress in implementing the provisions of the legislation, efforts have been hampered by funding and personnel constraints. In 1999 both the working group and Commission recommended to the National Marine Fisheries Service actions to overcome these problems.

Effects of Pollution on Marine Mammals (Chapter VII)

Marine mammals can be affected directly and indirectly by a variety of environmental contaminants. Direct effects include such things as mortality from toxic chemical spills. Indirect effects include such things as decreased longevity and decreased productivity due to contaminant-caused declines in key prey species. This chapter describes efforts by the Commission and others to identify and minimize threats posed by chemical contaminants and noise from various human sources. Efforts to address threats posed by lost and discarded fishing gear and other forms of marine debris are described in previous reports and in the sections of this report concerning Hawaiian monk seals and the Convention on the Conservation of Antarctic Marine Living Resources (Chapters III and V).

Effects of Chemical Contaminants — High levels of organochlorine compounds and other potentially harmful contaminants have been found in marine mammals throughout the world,

including some of those that died during the unusual mortality events described in Chapter VI. Recognizing the threats posed by environmental contaminants, in 1998 the Commission, in cooperation with other federal agencies, held a workshop to assess available information and identify critical data gaps and research needs regarding the effects of persistent ocean contaminants on marine mammals. The workshop report was completed in 1999 and was provided to scientists and organizations worldwide with interests and responsibilities related to the effects of contaminants on marine mammals and other marine organisms.

It was evident from the report that many federal and state agencies, international organizations, and academic institutions are conducting or supporting related research and that much of the research has been focused on assessing and monitoring exposure levels rather than determining effects. It also appeared that little, if anything, was being done to minimize duplication or to ensure that the research is focused on the most important issues. Therefore, when it transmitted the workshop report to the National Oceanic and Atmospheric Administration in July 1999 the Commission recommended that an interagency working group be established to identify priority research needs, review and foster coordination of domestic and international research programs to minimize duplication and better meet the identified needs, and develop proposals for cooperative budget initiatives to help meet the priority needs more cost-effectively. In November 1999 the Commission was advised that the National Oceanic and Atmospheric Administration was taking steps to establish the recommended working group.

The Commission has compiled and periodically updated a bibliography of published papers and reports on anthropogenic contaminants in the marine environment and their effects on marine mammals. The workshop, the bibliography, and other matters are discussed in this chapter.

Effects of Noise — Many species of marine mammals use sound to communicate, navigate, and locate prey. Sounds from both natural and human sources can interfere with these vital functions and, if loud or persistent, can cause temporary or permanent hearing loss. These possibilities are widely recognized and, as noted in previous Commission reports, an informal interagency group was established in 1997 to coordinate agency efforts to identify and determine how best to avoid or mitigate the possible adverse effects of anthropogenic sounds on marine mammals and other marine organisms. This section of the report provides background information and describes actions taken in 1999 by the Commission and other federal agencies, to assess the results of the marine mammal component of the Acoustic Thermometry of Ocean Climate Program; identify and determine how best to avoid the possible environmental impacts of operational deployment of the Navy's low-frequency active sonar; evaluate the pros and cons of a proposed field-test to determine whether a high-output pulsed-power generator can be used safely and effectively to minimize California sea lion predation on fish caught by recreational fishermen on commercial passenger fishing vessels; determine additional research and monitoring needed to better predict and minimize the effects of oil and gas development on marine mammals and sea turtles in the northern Gulf of Mexico; and develop terms of reference for soliciting and evaluating research proposals concerning the possible use of active sonars to reduce the risk of ships hitting right whales and other large cetaceans. Related information is provided in Chapter

VIII concerning offshore oil and gas development and in the part of Chapter X concerning incidental harassment authorizations.

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

Marine mammals may be affected adversely by oil spills, as well as noise and pollution from routine activities associated with offshore oil and gas exploration and development. Under the Outer Continental Shelf Lands Act, the Minerals Management Service has lead responsibility for ensuring that oil and gas related activities in U.S. waters beyond the jurisdiction of coastal states do not adversely affect marine mammals and their habitats. During 1999 the Marine Mammal Commission commented to the Service on a proposal to tap a natural gas reserve in the Gulf of Mexico, noting possible effects on marine mammals of pipeline construction to transport gas to shore and providing information on the effects of contaminants. The Commission also participated in a workshop convened by the Service to identify research and monitoring priorities for predicting and evaluating possible effects of offshore oil and gas development on protected species in the Gulf of Mexico. These and related matters are discussed in this chapter.

Research and Studies Program (Chapter IX)

The Marine Mammal Protection Act directs the Commission to conduct an ongoing review of marine mammal research supported by federal agencies to help identify and avoid duplicative work. It also directs the Commission to facilitate or support other activities it deems necessary to further the purposes of the Act. To meet these requirements in 1999 the Commission conducted its annual survey of federally-funded marine mammal research; organized or participated in numerous meetings to coordinate domestic and international marine mammal research and management programs; and supported research and studies to: (1) identify voluntary measures shipping companies can take to decrease the likelihood of their ships hitting and killing highly endangered northern right whales; (2) assess the status of Russian beluga whale stocks that would be affected by a proposed harvest to provide meat for sale in Japan; (3) assess climate-induced changes in sea ice and resulting impacts on Alaska Native communities dependent on marine mammals for subsistence and cultural purposes; and (4) assist U.S. efforts to implement the Arctic Environmental Strategy, particularly as it relates to conservation of marine mammals and their habitat in the Arctic.

Permits and Authorizations to Take Marine Mammals (Chapter X)

Subject to certain exceptions, the Marine Mammal Protection Act established a moratorium on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas. Taking is defined to include intentional and unintentional harassment, as well as hunting, capturing, and killing any marine mammal. The Act includes provisions for waiving the moratorium when certain conditions are met and for issuing permits authorizing taking for purposes of scientific research, public display, photography, and species enhancement. It also includes provisions authorizing the taking of marine mammals incidental to commercial fisheries,

as described in Chapter IV, and for authorizing the taking of small numbers of marine mammals incidental to activities other than commercial fishing when the taking will have negligible effects on the affected species or stock and no unmitigable effect on the availability of marine mammals for subsistence uses by Alaska Natives.

Depending on the species involved, permits and letters of authorization are issued by the National Marine Fisheries Service, on behalf of the Secretary of Commerce, or by the Fish and Wildlife Service, on behalf of the Secretary of the Interior, following notice and opportunity for public comment and consultation with the Commission. During 1999, the Commission, in consultation with its Committee of Scientific Advisors, reviewed and provided recommendations on 24 permit applications submitted to the Department of Commerce and 10 submitted to the Department of the Interior. These applications are listed in Appendix A.

The Commission also reviewed and provided comments to the Fish and Wildlife Service and the National Marine Fisheries Service on proposed authorizations to take marine mammals incidental to (1) oil and gas activities offshore Alaska, (2) operation of the nuclear power plant in Seabrook, New Hampshire, (3) rocket launches from Vandenberg Air Force Base in California, (4) marine hazards surveys offshore southern California, (5) strengthening the Richmond-San Rafael Bridge across San Francisco Bay, and (6) restructuring a swimming area in La Jolla, California. These and other actions are described in the section of this chapter entitled "Small-Take Authorizations."

This chapter also describes ongoing efforts by the National Marine Fisheries Service, in consultation with the Commission, to identify and determine how best to prevent or regulate potentially harmful interactions between humans and marine mammals in the wild.

Marine Mammals in Captivity (Chapter XI)

The Animal and Plant Health Inspection Service in the Department of Agriculture has regulatory responsibility for establishing and enforcing standards governing the care and transport of captive marine mammals under the Animal Welfare Act. Early in the 1990s the Commission recommended that the Service update those standards to incorporate advances in animal husbandry and marine mammal science, and the Service has been slow to act. In response, in 1995 and 1996 the Service convened a negotiated rulemaking committee representing the public display industry, animal welfare groups, and involved government agencies to negotiate needed rule changes. Consensus was reached on changes to some parts of the standards. These were to be published by the Service in 1997. For other parts of the standards on which the committee could not reach consensus, the Service decided to develop proposed changes itself. A proposed rule for the agreed changes was published in February 1999, and a final rule was undergoing agency review at the end of 1999. The Service's schedule at the end of 1999 called for publishing proposed changes to the more contentious, and potentially costly, portions of the standards by mid-2000.

Another long-standing issue has been the return of long-term captive marine mammals to the wild. To ensure that releases of such animals do not introduce diseases to wild populations and that released animals are properly prepared for life in the wild, the Commission recommended during the hearing discussed in Chapter II that the Marine Mammal Protection Act be amended to prohibit releases of marine mammals, other than those maintained under stranding and release programs, without specific authorization.

Appendices

Appendix A lists recommendations made by the Marine Mammal Commission in 1999. Appendix B lists Commission-sponsored reports made available through the Commission or the National Technical Information Service. Appendix C lists citations for other papers and reports resulting from Commission-sponsored work that have been published elsewhere. Appendix D provides the Commission's 29 June 1999 statement to the House Subcommittee on Fisheries Conservation, Wildlife and Oceans concerning implementation of the 1994 amendments to the Marine Mammal Protection Act.

Chapter I

INTRODUCTION

This is the 27th Annual Report of the Marine Mammal Commission, covering the period 1 January through 31 December 1999. 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 reviewing and making recommendations on domestic and international 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 members nominated by the President and confirmed by the Senate. The Marine Mammal Protection Act requires that Commissioners be knowledgeable in marine ecology and resource management. At the end of 1999 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 Vera Alexander, Ph.D., University of Alaska, Fairbanks.

The Commission's staff includes 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; Robert H. Mattlin, Ph.D., Assistant Scientific Program Director; Suzanne Montgomery, Special Assistant to the Executive Director; Alison Kirk Long, Permit Officer; Nancy L. Shaw, Administrative Officer; Darel E. Jordan, Staff Assistant; and Jacqueline L. Murphy, Staff Assistant for publications.

The Commission Chairman, with the concurrence of other Commissioners, appoints persons to the nine-member Committee of Scientific Advisors on Marine Mammals. The Marine Mammal Protection Act requires that committee members be scientists who are knowledgeable in marine ecology and marine mammal affairs. At the end of 1999 the committee members were Lloyd F. Lowry (Chairman), Alaska Department of Fish and Game, Fairbanks; Daryl J. Boness, Ph.D., Smithsonian Institution, Washington, DC; Joseph R. Geraci, V.M.D., Ph.D., National Aquarium in Baltimore, Baltimore, Maryland; Steven K. Katona, Ph.D., College of the Atlantic, Bar Harbor, Maine; Bruce R. Mate, Ph.D., Oregon State University, Newport; Stephen B. Reilly, Ph.D., National Marine Fisheries Service, La Jolla, California; Barbara L. Taylor, Ph.D., National Marine Fisheries Service, La Jolla, California; Jeanette A. Thomas, Ph.D., Western Illinois University, Moline; and Douglas Wartzok, Ph.D., University of Missouri, St. Louis.

During 1999 Robert L. Brownell, Jr., Ph.D., National Marine Fisheries Service, La Jolla, California, completed his term of service on the Committee and was replaced by Dr. Reilly. In January 2000 Frances M.D. Gulland, Vet. M.B., Ph.D., The Marine Mammal Center, Sausalito, California; Galen B. Rathbun, Ph.D., Cambria, California; and Peter L. Tyack, Ph.D., Woods Hole Oceanographic Institution, Woods Hole, Massachusetts, will be appointed to replace Drs. Geraci, Mate, and Thomas.

During 1999 Mr. Caleb Pungowiyi, Executive Director of the Eskimo Walrus Commission, former president of the Inuit Circumpolar Conference, and resident of Kotzebue, Alaska, served as Special Advisor to the Marine Mammal Commission on Native Affairs.

Funding

Appropriations to the Marine Mammal Commission in the past five fiscal years have been FY 1995, \$1,384,000; FY 1996, \$1,190,000; FY 1997, \$1,189,000; FY 1998, \$1,185,000; and FY 1999, \$1,240,000. The Commission's appropriation for the current fiscal year, FY 2000, is \$1,265,000.

Chapter II

REAUTHORIZATION OF THE MARINE MAMMAL PROTECTION ACT

The Marine Mammal Protection Act was enacted in 1972. Since then, it has been amended and reauthorized several times. The most recent amendments, making changes to the Act's tuna-dolphin provisions (see Chapter IV), were enacted in 1997. Major amendments to the Act were also enacted in 1994. At that time, the provisions authorizing appropriations for purposes of carrying out the Act were extended through fiscal year 1999. It was anticipated that Congress would review implementation of the Act and consider reauthorizing appropriations during 1999. Although the Act has yet to be reauthorized, its provisions remain in effect and Congress continues to appropriate funding to carry out its mandates.

As expected, Congress began the reauthorization process during 1999. The Subcommittee on Fisheries Conservation, Wildlife, and Oceans of the House Resources Committee held an initial hearing on 29 June 1999 at which it requested that the four federal agencies with primary responsibilities related to implementing the Act testify on implementation of the 1994 amendments and identify problems that may warrant additional legislation. In addition to the Marine Mammal Commission, the National Marine Fisheries Service, the Fish and Wildlife Service, and the Animal and Plant Health Inspection Service participated in the hearing.

It is expected that the House Resources Committee will hold two or three additional hearings in 2000 as part of the reauthorization process. Although the specific issues to be considered have yet to be determined, they may include marine mammal-fishery interactions, conservation of sea otters in California, and co-management agreements between federal agencies and Alaska Native organizations. It is also likely that a concluding hearing will be held to solicit comments on the specific provisions of the re-

authorization bill once it has been drafted. As of the end of 1999 it was unclear whether and, if so, when the Senate plans to schedule hearings on reauthorization of the Act.

At the 29 June 1999 hearing the Commission submitted a comprehensive review of the 1994 amendments, describing the steps that have been taken by the Commission and others to implement those provisions and identifying those provisions that have yet to be fully implemented. The statement also identified particular areas where amendments may be useful and on which Congress may want to focus its attention as it considers reauthorizing the Act. The full text of the Commission's statement is provided in Appendix D to this report.

The Commission recommended that Congress consider amending the Marine Mammal Protection Act in the following areas.

Taking Incidental to Commercial Fisheries

As discussed in Chapter IV, the 1994 amendments established a new regime to govern the taking of marine mammals incidental to commercial fishing. The Commission, at the 29 June hearing, noted that the new process has been working reasonably well. Nevertheless, it suggested that certain refinements should be considered. For example, the Commission expressed the view that there should be no doubt that it constitutes a violation of the Marine Mammal Protection Act for a fisherman to engage in a fishery that frequently or occasionally takes marine mammals (a category I or II fishery) without first having registered with the National Marine Fisheries Service to obtain an authorization. Also, the Commission suggested that Congress consider expanding the possible penalties for violations of the incidental take

regime by allowing the Service to seek the forfeiture of the catch from any fishing operations conducted without obtaining the required authorization or to assess a substantial fine against the offending vessel.

The Commission noted that funding has not always been sufficient to place observers within all fisheries and on all fishing vessels that need to be monitored or to place enough observers to provide statistically reliable results. The Commission therefore recommended that Congress consider alternative ways to fund the observer program, including requiring a contribution from the involved fisheries.

Other fishery-related amendments suggested by the Commission included (1) specifying that take reduction plans need not be prepared for those strategic stocks for which mortality and serious injury resulting from commercial fisheries are inconsequential; (2) requiring the National Marine Fisheries Service to consider California sea otters in its classification of fisheries and placement of observers, even though no incidental taking from this stock is authorized; and (3) as a housekeeping matter, deleting section 114, which previously governed incidental taking in commercial fisheries, but which is no longer in force.

Pinniped-Fishery Interactions

Section 120 of the Act, added by the 1994 amendments, included a mechanism under which the National Marine Fisheries Service may authorize the lethal removal of pinnipeds by states if the animals are having a significant negative impact on the decline or recovery of certain salmonid fishery stocks. That section also directed the National Marine Fisheries Service to engage in a scientific investigation and prepare a report on interactions between California sea lions and Pacific harbor seals and salmonid fishery stocks. As discussed in the pinniped-fishery interactions section of Chapter IV, the Service recommended, among other things, that state and federal resource agencies be authorized to kill problem animals in areas where they are known or believed to be preying on depleted salmonid stocks when (1) there are no non-lethal means available to address the problem as effectively or as economically, (2) a salmonid conservation or recovery plan is in place or under develop-

ment, and (3) recovery efforts are under way to address other factors affecting the stock's status.

In its 29 June testimony the Commission concurred that resource agencies should be given authority to stop pinniped predation that is preventing or impeding the recovery of depleted salmonid stocks and that lethal methods are appropriate when non-lethal measures are not likely to be practical or effective. The Commission cautioned, however, that such authority should be available only in those instances when a conservation or recovery plan that appropriately addresses all factors responsible for the salmonid stock's depressed status is in place, the plan has been made available for review by interested parties and approved by the Service, and procedures have been established to verify that the authorized management actions are having the expected results.

The Commission also noted that lethal taking of pinnipeds may also be appropriate to prevent losses in aquaculture operations, but any such authority should be limited to those instances when the operators have met certain standards with respect to pen design and construction to prevent seals from entering fish pens.

Permits for Public Display, Scientific Research, and Other Purposes

The 1994 amendments made extensive changes to the Act's permit provisions. Among other things, they eliminated the authority of the National Marine Fisheries Service and the Fish and Wildlife Service to impose permit conditions concerning the maintenance of marine mammals in captivity, relying solely on Animal and Plant Health Inspection Service regulation of such matters under the Animal Welfare Act. In response to this shift in agency responsibilities, the Commission recommended that two of the pre-existing policies of the National Marine Fisheries Service be re-established statutorily. First, the Commission recommended that Congress ban traveling exhibits involving cetaceans because of the high stress levels and other risks posed by such exhibits on this group of animals. Second, the Commission recommended that the Act be amended to add a specific prohibition against releasing captive marine mammals, other than those being maintained under a stranding and rehabili-

tation program, without specific authorization (*e.g.*, a scientific research permit) structured to require sufficient preparation, medical screening, and monitoring of released animals.

The National Marine Fisheries Service has interpreted the provision of the 1994 amendments that requires a public display facility to be registered under the Animal Welfare Act as limiting the availability of public display permits to exhibits of live animals. However, in some instances, there may be merit to displays of parts or products made from dead marine mammals. The Commission therefore recommended that the public display provision of the Act be broadened, or a new provision added, that would allow for the issuance of permits for the display of marine mammal parts or products, provided that adequate safeguards are included to prevent such permits from being used as a subterfuge for the display of hunting trophies or commercial products that otherwise could not be authorized.

Although potentially of broader applicability, another amendment related to public display was recommended by the Commission. As discussed in Chapter XI and previous annual reports, there was an instance in which the responsible agencies were unable to take timely action to prevent the unauthorized release of captive dolphins to the wild. The Commission believes that, to enable the agencies to respond to such situations in the future, the Act should be amended to include a provision explicitly authorizing them to seek injunctive relief to prevent anticipated violations of the Animal Welfare Act or the Marine Mammal Protection Act when such violations pose risks to the welfare of the animals, the public, or wild marine mammal populations. The Commission noted that incorporating this authority in the Marine Mammal Protection Act would be consistent with the provisions of the Endangered Species Act and other natural resource statutes.

The Commission's testimony noted the usefulness of the 1994 amendment that created a general authorization under which certain types of research that may disturb, but not injure, marine mammals can be conducted without requiring investigators to obtain a scientific research permit. One shortcoming of the general authorization identified by the Commission

was its unavailability for research involving marine mammals listed as endangered or threatened under the Endangered Species Act. The Commission therefore recommended that Congress consider expanding the general authorization to include benign research involving all marine mammal species.

The permit provisions enacted in 1994 require that foreign facilities receiving marine mammals from the United States meet requirements comparable to those applicable to U.S. facilities, including those pertaining to the care and maintenance of captive marine mammals under the Animal Welfare Act. The Commission noted, however, that unlike domestic facilities, whose compliance with the Animal Welfare Act is determined by periodic inspections, determinations with respect to foreign facilities are based solely on written submissions and a certification by the responsible foreign government, which may or may not inspect the facility. The Commission questioned the ability of U.S. agencies to detect compliance problems at foreign facilities and to compel remedial actions. The Commission therefore identified two ways that the provisions applicable to marine mammal exports might be improved. To strengthen the reliability of the comparability determinations, the Commission suggested that Congress consider requiring a physical inspection of a facility before approving an export. Alternatively, the Act could be amended to restrict exports to facilities in those countries that have demonstrated that they have in place a program for overseeing the welfare of captive marine mammals comparable to that established by the United States under the Animal Welfare Act.

Prohibitions

Section 102(a)(4) was amended in 1994 to add a prohibition against exporting any marine mammal or marine mammal product taken in violation of the Act or for any purpose other than public display, scientific research, or species enhancement. However, this amendment, which was part of a package of permit-related amendments, failed to recognize other provisions of the Act under which exports are or may be authorized. The Commission therefore recommended that the export provision be amended to delineate other purposes for which exports may be allowed, including exports (1) of Alaska Native handicrafts, (2)

for purposes of cultural exchanges between Alaska Natives and Native inhabitants of Russia, Canada, and Greenland, (3) of articles taken abroad in conjunction with personal travel by U.S. citizens, and (4) authorized by a waiver of the Act's moratorium.

The amendment to section 102(a)(4), perhaps inadvertently, also heightened the evidentiary burden on federal prosecutors bringing cases for violations involving the transport, purchase, sale, or export of marine mammals. This provision had been amended in 1981 to address enforcement difficulties by clarifying that the government need not prove that the underlying taking of a marine mammal was illegal to proceed against individuals who are otherwise in violation of the Act. The Commission recommended reversion to the pre-1994 statutory language.

Definitions

Among those definitions added to the Act in 1994 was a two-part definition of "harassment," a form of taking. Level A harassment is defined as any act of pursuit, torment, or annoyance that has the potential to injure a marine mammal or marine mammal stock in the wild. Level B harassment is defined as any act of pursuit, torment, or annoyance that 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. Although these definitions seem relatively straightforward, some difficulty has been experienced in their implementation. The Commission therefore recommended that Congress consider amending the definitions by eliminating the limitation that the potential injury or disturbance be caused by an act of pursuit, torment, or annoyance.

Small-Take Provisions

Section 101(a)(5), the Act's "small-take provision," directs the National Marine Fisheries Service and the Fish and Wildlife Service to authorize the taking of small numbers of marine mammals incidental to activities other than commercial fishing if it is expected to have a negligible impact on the affected stocks and will not have any unmitigable impacts on

the availability of marine mammals for Native subsistence uses in Alaska. A streamlined procedure for authorizing incidental taking by harassment was added in 1994. Although expressing general support for this provision, the Commission expressed concern that some applicants may be availing themselves of the streamlined authorization process by segmenting long-term activities into one-year intervals and seeking a separate authorization for each, or by seeking a separate authorization for each of several similar or related activities, which by itself has only negligible impacts. To address these problems, the Commission recommended that Congress consider an amendment that would lengthen the period for which harassment-only authorizations may be issued or require the Services, when reviewing applications to take small numbers of marine mammals by harassment, to consider all related activities that may cumulatively result in more than a negligible impact.

Co-Management Agreements

Section 119 was added to the Act in 1994 to authorize funding for and to encourage development of cooperative agreements between the National Marine Fisheries Service and the Fish and Wildlife Service and Alaska Native organizations to conserve marine mammals and provide co-management of subsistence use by Alaska Natives. The Commission's testimony pointed out that such agreements, to the extent that they are intended to regulate or limit subsistence taking, will be successful only if all hunters voluntarily abide by those limits or the Native organization entering into the agreement can effectively exert control over all Native hunters that utilize the marine mammal stock. The Commission noted that, although Alaska Natives traditionally have demonstrated a willingness to act responsibly in conserving marine mammals and other resources, the recent experience with Cook Inlet beluga whales (see Chapter III) demonstrates the need to strengthen the enforceability of co-management agreements. The Commission recommended that Congress consider ways in which the co-management provisions of the Act could be amended to provide effective mechanisms for enforcing agreements between the responsible federal agencies and Native organizations.

Authorization of Appropriations

As noted above, the authorization for appropriating funds to carry out the provisions of the Marine Mammal Protection Act expired at the end of fiscal year 1999. At the 29 June hearing the Commission recommended that the Act be amended to authorize appropriations for the Department of Commerce, the Department of the Interior, and the Marine Mammal Commission for a five-year period.

Other Possible Amendments

The Commission's testimony also noted that certain provisions of the Act had not been updated to reflect changes in economic circumstances since they were originally enacted in 1972. The Commission therefore recommended that the penalty provisions and

other sections of the Act establishing monetary limits be reviewed and adjusted as necessary.

The Commission also commented on a more general shortcoming of the Act. It noted that, as the Act and agency budgets and programs are currently structured, most research and conservation actions are undertaken in response to acute, often controversial, conservation issues. The Commission expressed the view that it would be desirable for the responsible agencies to put more effort into anticipating problems and taking steps to prevent such problems from developing in the first place. The Commission therefore recommended that Congress consider the need to support broad-based, interdisciplinary, anticipatory research that will allow the government to take action to address issues before they become serious problems.

Chapter III

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 conserve marine mammals. To meet this charge, the Commission devotes special attention to particular species and populations that are vulnerable to various types of human impacts. 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 other species or populations facing special conservation challenges.

During 1999 special attention was directed to a number of endangered, threatened, or depleted species or populations. As discussed below, these include northern right whales, bowhead whales, the western North Pacific stock of gray whales, mid-Atlantic coastal bottlenose dolphins, Hawaiian monk seals, Steller sea lions, southern sea otters, and West Indian manatees. Other species not so listed, but which received special attention, include eastern North Pacific gray whales, Gulf of Maine harbor porpoises, bottlenose dolphins (other than the mid-Atlantic coastal bottlenose dolphins), Cook Inlet beluga whales, Pacific walruses, polar bears, and sea otters in Alaska.

Northern Right Whale *(Eubalaena glacialis)*

Northern right whales face a greater risk of extinction than any other species of large whale. They occur only in the North Atlantic and North Pacific Oceans. As the preferred target of commercial

whalers from the 11th through the 19th centuries, northern right whales were reduced to perilously low numbers by the late 1800s and had become economically extinct in both oceans. Despite their low numbers, right whales continued to be killed throughout the first two decades of the 20th century whenever whalers seeking other species happened upon remaining individuals. In 1935 a ban on hunting all right whales was adopted internationally, but even then they were killed opportunistically by whalers of nations slow to accept the ban, by illegal whaling operations, and for scientific research under international provisions allowing nations to unilaterally authorize the take of any whale species for that purpose.

Gradually, however, the killing of northern right whales declined, and since the 1970s intentional taking appears to have stopped. Even with this respite from whaling, the three surviving populations of northern right whales — one in the western North Atlantic, one in the western North Pacific, and one in the eastern North Pacific — have shown little signs of recovery and their long-term survival is in grave doubt.

In the North Pacific Ocean, the largest surviving population is found off eastern Asia, principally in the Okhotsk Sea off Russia. Although limited survey data preclude development of a reliable abundance estimate, the western North Pacific population may still number in the low hundreds. The size of the eastern North Pacific population is even less well known and it may number only a few tens of animals. As recently as the 1950s, the eastern North Pacific right whale population may have numbered in the low hundreds. Soon thereafter, however, it was apparently all but eliminated by a spate of illegal whaling by whalers from the former Soviet Union who killed several hundred animals. There have been about 80 sighting records from southern California and Hawaii to Alaska over the past 30 years; almost all involve one

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 1999¹

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>	<u>Range</u>
<i>Manatees and Dugongs</i>			
West Indian manatee	<i>Trichechus manatus</i>	E/D	Caribbean Sea and North Atlantic from southeastern United States to Brazil; and Greater Antilles Islands
Amazonian manatee	<i>Trichechus inunguis</i>	E/D	Amazon River basin of South America
West African manatee	<i>Trichechus senegalensis</i>	T/D	West Africa coasts and rivers; Senegal to Angola
Dugong	<i>Dugong dugon</i>	E/D	Northern Indian Ocean from Madagascar to Indonesia; Philippines; Australia; southern China; Palau
<i>Otters</i>			
Marine otter	<i>Lutra felina</i>	E/D	Western South America; Peru to southern Chile
Southern sea otter	<i>Enhydra lutris nereis</i>	T/D	Central California coast
<i>Seals and Sea Lions</i>			
Hawaiian monk seal	<i>Monachus schauinslandi</i>	E/D	Hawaiian Archipelago
Caribbean monk seal	<i>Monachus tropicalis</i>	E/D	Caribbean Sea and Bahamas (probably extinct)
Mediterranean monk seal	<i>Monachus monachus</i>	E/D	Mediterranean Sea; northwest African coast
Guadalupe fur seal	<i>Arctocephalus townsendi</i>	T/D	Baja California, Mexico, to southern California
Northern fur seal	<i>Callorhinus ursinus</i>	D	North Pacific Rim from California to Japan
Western North Pacific Steller sea lion	<i>Eumetopias jubatus</i>	E/D	North Pacific Rim from Japan to Prince William Sound, Alaska (east of 144°W longitude)
Eastern North Pacific Steller sea lion	<i>Eumetopias jubatus</i>	T/D	North Pacific Rim from Prince William Sound, Alaska, to California (east of 144°W longitude)
Saimaa seal	<i>Phoca hispida saimensis</i>	E/D	Lake Saimaa, Finland
<i>Whales, Porpoises, and Dolphins</i>			
Baiji	<i>Lipotes vexillifer</i>	E/D	Changjiang (Yangtze) River, China
Indus river dolphin	<i>Platanista minor</i>	E/D	Indus River and tributaries, Pakistan
Vaquita	<i>Phocoena sinus</i>	E/D	Northern Gulf of California, Mexico
Northeastern offshore spotted dolphin	<i>Stenella attenuata</i>	D	Eastern tropical Pacific Ocean
Eastern spinner dolphin	<i>Stenella longirostris orientalis</i>	D	Eastern tropical Pacific Ocean
Mid-Atlantic coastal bottlenose dolphin	<i>Tursiops truncatus</i>	D	Atlantic coastal waters from New York to Florida
Northern right whale	<i>Eubalaena glacialis</i>	E/D	North Atlantic, North Pacific Oceans; Bering Sea
Southern right whale	<i>Eubalaena australis</i>	E/D	South Atlantic, South Pacific, Indian, and Southern Oceans
Bowhead whale	<i>Balaena mysticetus</i>	E/D	Arctic Ocean and adjacent seas
Humpback whale	<i>Megaptera novaeangliae</i>	E/D	Oceanic, all oceans
Blue whale	<i>Balaenoptera musculus</i>	E/D	Oceanic, all oceans
Finback or fin whale	<i>Balaenoptera physalus</i>	E/D	Oceanic, all oceans
Western North Pacific gray whale	<i>Eschrichtius robustus</i>	E/D	Western North Pacific Ocean
Sei whale	<i>Balaenoptera borealis</i>	E/D	Oceanic, all oceans
Sperm whale	<i>Physeter macrocephalus</i>	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 50 C.F.R. §216.15.

or two animals, and none include calves. During the past three summers, aerial and shipboard surveys have been conducted by the National Marine Fisheries Service in cooperation with the Coast Guard in the eastern Bering Sea. During these surveys, sightings of right whales were reported in the southeastern Bering Sea northwest of the Alaska Peninsula. These sightings, some of which include groups of perhaps four to eight whales, likely reflect the discovery of a summer feeding area.

The northern right whale population with the largest reliable population estimate — about 300 to 325 whales — occurs in the western North Atlantic Ocean off the U.S. and Canadian coasts. Since the late 1970s this population has been studied intensively at five seasonal habitats. Three of these are in U.S. waters and two are in Canada. They are (1) the species' only known calving area off the coasts of Georgia and northern Florida, used principally from January through March, (2) a feeding and nursery area in Cape Cod Bay, Massachusetts, with peak whale abundance between February and April; (3) a feeding area in the Great South Channel east of Cape Cod, used mainly between April and June; (4) a summer feeding and nursery area in the lower Bay of Fundy, Canada, used between August and September; and (5) a feeding area south of Nova Scotia, used by some adult whales in late summer and fall.

Over the past 20 years, photo-identification studies principally in these five areas have produced a photo catalogue thought to include almost every whale in the population. Characteristic scars and callosities (roughened patches of skin on a whale's head) are used to distinguish individual whales, and the catalogue has enabled researchers to assess whale movement and life history patterns from resighting records. A recent analysis of catalogue data suggests that the population may have increased at a rate of about two percent per year in the late 1980s, but has been decreasing by about two percent per year since the early 1990s. These trends contrast sharply with most other large whale populations, which have been increasing at annual rates of four percent or greater since the cessation of most whaling in the 1980s.

There are several possible reasons why the western North Atlantic population has shown little evidence of

recovery. Among them are the extremely small size to which it was reduced and its inherently low reproductive rate. Female northern right whales reach sexual maturity at about eight years of age and can successfully rear a single calf only once every three to five years at best. In addition, changing climatic patterns may affect reproduction. Over the past 20 years, the western North Atlantic population has produced an average of about 12 calves per year, including 6, 9, 7, 22, 20, and 5 calves in 1993 to 1998, respectively. In 1999 only four calves were counted, the lowest number since monitoring began in 1980. In recent years the average calving interval for mature females has increased from less than four years to nearly six years, suggesting a decrease in reproductive potential. The reproductive rate for this population appears to be half that of recovering populations of southern right whales (*E. australis*) in the Southern Hemisphere.

With so few births, right whale deaths due to human causes can easily affect population recovery. Collisions with ships and entanglement in fishing gear are the known causes of human-related right whale mortality; they almost certainly are contributing, if not major, factors limiting population growth. At least 40 percent of all right whale carcasses found from 1970 through 1999 (19 of 45) and about half of all carcasses found since 1991 (11 of 21) had been either struck by ships, entangled in fishing gear, or both. As noted in past annual reports, perhaps one-third of all right whale deaths are actually documented through the recovery or sighting of carcasses. If so, and if the proportion of human-related deaths among carcasses not known is the same as that among observed carcasses, then human causes may be responsible for three to six deaths annually. This small number of deaths nevertheless represents a substantial proportion of the total number of births documented in recent years and could explain why the population is not increasing. Although reducing such a small number of accidental deaths is a daunting challenge, the species' survival may well depend on doing so.

Other factors also may be limiting population recovery, but to date there is no clear evidence that any of these have had or are having substantial effects. The possibilities include disease, effects of

contaminants, limited prey availability, and a high proportion of infertile animals.

The National Marine Fisheries Service has lead responsibility for research and management actions to promote recovery of northern right whales under both the Marine Mammal Protection Act and the Endangered Species Act. Many other federal and state agencies have related responsibilities under these and other statutes. Government agencies in Canada and many non-governmental groups also have substantial interests in, and have made important contributions to, right whale recovery efforts. Among the non-governmental groups are the Center for Coastal Studies, the Humane Society of the United States, the International Fund for Animal Welfare, the Massachusetts Environmental Trust, the New England Aquarium, the University of Rhode Island, and Woods Hole Oceanographic Institution. To help coordinate recovery actions, the National Marine Fisheries Service, at the urging of the Marine Mammal Commission, developed a northern right whale recovery plan under provisions of the Endangered Species Act. Adopted in 1991, the plan focuses on the western North Atlantic right whale population because its size, location, and level of human-related impacts make it the population most likely to benefit from the application of limited funding resources. As discussed in past annual reports, the Commission has continued to review right whale research and management needs and to provide advice to the Service and other involved agencies and groups.

To help implement recovery activities for right whales in the western North Atlantic Ocean, the Service established two regional implementation teams with representatives from regional offices of federal and state agencies, industry associations, environmental organizations, and research groups. One of these teams addresses recovery needs in the right whale calving area off Florida and Georgia, and the other addresses recovery needs for right whales and humpback whales in feeding grounds off the northeastern U.S. coast. In addition, the Service established an Atlantic Large Whale Take Reduction Team in 1996 pursuant to requirements added to the Marine Mammal Protection Act in 1994. This team, with representatives from federal and state agencies, relevant fisheries, environmental organizations, and the re-

search community, is charged with identifying measures to reduce the incidental catch of endangered whales, including northern right whales, in gillnets and lobster pot lines along the Atlantic coast. A representative of the Marine Mammal Commission participates on all three teams.

Developments concerning recovery efforts for northern right whales off the U.S. and Canadian east coasts during 1999 are discussed below.

Right Whale Mortalities and Injuries

In the past 20 years, the annual number of observed right whale deaths has ranged from zero to six, with an average of about two per year. In 1999 two confirmed deaths were reported; both were human-related. The first was a carcass found floating six miles off Wellfleet, Massachusetts, in Cape Cod Bay on 20 April 1999. Spotted by a right whale aerial survey team, the carcass was that of an adult female (whale #1014, Fig. 1) known to researchers since she was first identified in 1974. Sighted regularly since then, she had given birth to six calves between 1977 and 1997 and was seen alive nine times in Cape Cod Bay between 17 January and 15 April 1999. Immediately after its discovery, the carcass was towed ashore by the Coast Guard. Subsequent examination revealed signs of blunt trauma, including a broken jaw, indicating that death was caused by a ship strike. From signs of healing on the broken jaw, it appeared that the animal had been struck 7 to 10 days before death.

The second confirmed death was a 12-year-old female (whale #2030) entangled in gillnet gear. She was first spotted entangled by an aerial survey team on 10 May in the Great South Channel off Massachusetts. Although considered a candidate for rescue work, the whale could not be resighted at that time. However, early in September she was resighted in the Bay of Fundy near the U.S.-Canada border. By then the entangling ropes had cut a seven- to eight-inch gash in the blubber on her back and she was in poor condition. Several unsuccessful attempts were made to remove the gear, and a satellite tag was attached to a trailing rope to help relocate her for further disentanglement attempts. In mid-September she left the Bay of Fundy and was tracked to waters off northern New Jersey, where the tag apparently came off in

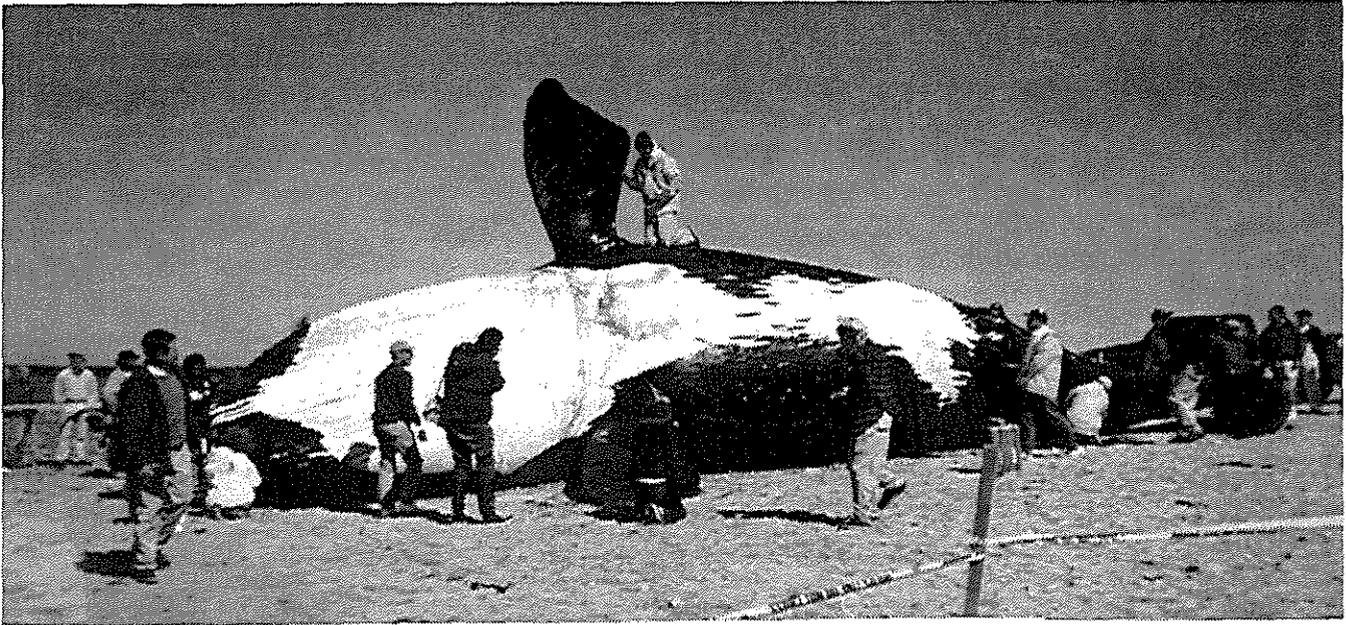


Figure 1. Adult female northern right whale killed by a vessel collision in Cape Cod Bay and towed ashore for necropsy on 11 May 1999. (Photo courtesy of Center for Coastal Studies, Provincetown, Massachusetts)

early October. On 20 October, she was found floating dead several miles off Cape May, New Jersey. The U.S. Coast Guard towed the carcass to shore, where she was necropsied on 21-22 October.

At least four other entangled right whales were seen during 1999. Two of these were first seen early in May in the Great South Channel at about the same time that whale #2030 was first seen entangled. The other entangled whales included another adult female (whale #1158) and an unidentified animal. Whale #1158 was first seen entangled on 19 May with line and three buoys wrapped around her body. She was resighted in the Great South Channel on 27 and 29 May and again in the lower Bay of Fundy on 21 June. Unsuccessful disentanglement attempts were made on 19 and 29 May and 21 June. She was resighted in the lower Bay of Fundy early in September and subsequent disentanglement work successfully removed most of the gear by early October. When last seen in 1999 the remaining entangling ropes had loosened, and she appeared to be in good condition. The other entangled whale first seen in the Great South Channel

was not seen after the initial sighting and the extent of its entanglement was not clear.

A third entangled whale, a two-year-old female, was found in the lower Bay of Fundy on 5 June with 200 feet of line and a buoy trailing from her mouth. The whale was spotted by a whale rescue team from the Center for Coastal Studies during a fortuitous crossing of the Bay between whale disentanglement training sessions in Nova Scotia and New Brunswick, Canada. All but a short piece of line in the animal's mouth was successfully removed. From markings on the buoy, it was determined that the gear was from a lobster pot set south of Nantucket, Massachusetts.

The fourth entangled whale was a young female (whale #2660) first seen entangled in September in the Bay of Fundy. This whale, spotted by a right whale research team from the New England Aquarium, had rope wrapped around her body behind the blow hole. This animal may have been the unidentified whale seen entangled in the Great South Channel in spring. Although efforts to remove the attached line were unsuccessful, when last seen the whale appeared to be in good condition.

Collisions between Right Whales and Ships

Ship collisions have been responsible for more than one-third of all known right whale deaths off the eastern U.S and Canadian coasts since 1970 (16 of 44 deaths). They also constitute nearly 90 percent of all known human-caused right whale deaths (16 of 18 deaths). Given the small size of the right whale population, these numbers indicate that right whales are more vulnerable to ship strikes than most other large whales. This may be due to a combination of factors: their relatively slow swimming speed; their extensive use of coastal waters near major shipping lanes; their surface behavior (*e.g.*, logging or resting quietly at the surface, skim feeding, nursing, and mating); the limited ability of calves to dive; and their apparent inability to detect or locate moving ships.

As an initial step to alert vessel traffic to the location of right whales and thereby to reduce collisions, the Navy, the Coast Guard, and the Army Corps of Engineers, in consultation with the National Marine Fisheries Service, funded an "early warning system" in the winter of 1993-1994 in the southeastern U.S. right whale calving grounds. The system relies on daily aerial surveys (weather permitting) to locate whales during the winter calving season. Their positions are then relayed to area ships via port pilots, voice radio, broadcast notice to mariners, and NAV-TEX (a telex communication network). In addition, outreach efforts are made to advise vessel operators of the risk of hitting right whales and the need for steps to avoid such collisions.

Since 1994 the early warning system has been steadily refined and improved. Supplemental survey flights have been supported or undertaken by the National Marine Fisheries Service, the Navy, the Georgia Department of Natural Resources, and the Florida Department of Environmental Protection (now the Florida Fish and Wildlife Conservation Commission). Also, procedures for disseminating right whale sighting locations have been streamlined largely through efforts by the Navy's regional Fleet Activity Control and Surveillance Facility, which assumed responsibility for operating a communications hub for regional right whale sighting reports.

Based on these efforts, a similar program was begun in 1996 for right whale feeding areas off Massachusetts (*e.g.*, Cape Cod Bay and the Great South Channel). The northeast program is coordinated by the National Marine Fisheries Service in cooperation with the Coast Guard, the state of Massachusetts, the Center for Coastal Studies, and the New England Aquarium. As discussed in past annual reports, the Marine Mammal Commission helped augment both systems by encouraging and assisting efforts led by the International Fund for Animal Welfare to develop information on right whales for two key nautical references published by the National Ocean Service: the *United States Coast Pilot* and nautical charts. As discussed below, the Commission also helped ensure that mariners in both areas are made aware of right whale protection needs by providing assistance in developing mandatory ship reporting systems, encouraging steps to improve communications with ships transiting the right whale calving grounds, and encouraging cooperative efforts by shipping companies regularly transiting key right whale habitats.

Mandatory ship reporting systems — In July 1996 the U.S. Coast Guard published a draft environmental impact statement on proposed actions to strengthen its involvement in protecting right whales and other endangered species along the U.S. Atlantic coast. In its September 1996 comments supporting Coast Guard attention to right whales, the Commission noted a need to examine available legal authorities for managing vessel traffic in key right whale habitats, including the possible use of two measures adopted by the International Maritime Organization (IMO) in the mid-1990s on vessel routing and vessel reporting. The IMO is charged with developing international standards for navigation, and the Coast Guard represents the United States at IMO meetings. Given the potential for routing measures to direct ships through right whale habitats in a less hazardous way, and for reporting measures to ensure that vessel operators are aware of right whale protection needs, the Commission offered to help the Coast Guard draft an information paper to the IMO on vessel-related threats to right whales, actions being taken in the United States, and the possible application of the two IMO provisions.

The relevance of IMO measures was again raised at a Shipping/Right Whale Workshop convened by the New England Aquarium on 17-18 April 1997. Because no steps had yet been taken to approach the IMO about right whale protection needs, the Marine Mammal Commission began drafting an information paper on the issue for the IMO. In cooperation with the National Marine Fisheries Service, the Commission's initial draft was revised and transmitted jointly to the U.S. Coast Guard. After further revisions, it was submitted as an information paper for a September 1997 meeting of the IMO's Marine Environment Protection Committee.

Because of limited data on vessel traffic patterns in key right whale habitats off the U.S. east coast, the need to ensure that vessel operators transiting these areas are aware of right whale protection needs, and a desire to minimize impacts on ship traffic, the Service decided to develop an action paper for the IMO recommending that mandatory ship reporting systems be established in key right whale feeding areas off Massachusetts and in the calving grounds off Florida and Georgia. The resulting proposal, developed in consultation with the Commission, the Coast Guard, and the International Fund for Animal Welfare, called for requiring all ships greater than 300 gross tons to contact a shore station for information on right whales upon entering certain defined areas in both regions. The defined areas encompassed designated right whale critical habitats plus adjacent waters where ships and right whales were likely to encounter one another. Because most vessels more than 300 gross tons are equipped for INMARSAT communications — a satellite communications system for relaying telex messages to ships around the world — it was decided to develop an automated reporting system using INMARSAT.

When entering either designated area, a large ship would be required to contact the shore station via INMARSAT and provide its name, call sign, position, course, speed, and destination. This information could be used to assess vessel traffic patterns and collision risks for right whales. Upon contact, the shore station would automatically send a return message explaining the importance of the area for right whales, the need for special efforts to avoid hitting whales, the availability of advice in this regard

in *Coast Pilots*, recent locations of right whale sightings, and the need to monitor NAVTEX and other broadcasts for new whale sightings and advisories.

Previously approved ship reporting systems have been designed principally for navigation safety. Because of the proposal's focus on environmental protection, concerns were brought to the attention of the National Security Council about the possible proliferation of such systems for environmental protection and resulting effects on navigational freedom. However, because environmental protection is cited as a purpose of ship reporting systems and because of the pressing, highly unusual circumstances prompting the proposal, President Clinton directed that the proposal be submitted to the IMO, where it received unanimous approval from the IMO's Marine Safety Committee at its meeting on 7-11 December 1998. To clarify domestic authority for enforcing the reporting systems, the U.S. Congress amended section 11 of the Ports and Waterways Act in December 1998. By letter of 21 December 1998 the Commission commended the National Marine Fisheries Service for all it had done to develop the two mandatory ship reporting systems.

Early in 1999 the National Marine Fisheries Service and the Coast Guard made final arrangements with a contractor to operate the two ship reporting systems and archive data from reporting vessels. All system costs, including satellite messages to and from reporting vessels, will be paid for jointly by the Service and the Coast Guard. On 1 June 1999 the Coast Guard published interim final regulations for both ship reporting systems in the *Federal Register*. Reporting requirements for the southeastern area apply only during the winter calving season when right whales are likely to be present (15 November through 15 April). Because right whales may occur in Cape Cod Bay or the Great South Channel in all months, requirements for the northeastern area are effective year-round. On 28 June 1999 the Marine Mammal Commission wrote to the Coast Guard expressing support for the interim rules and commending the Coast Guard for its part in developing the two systems. The interim rules became effective on 1 July 1999, with both systems administered jointly by the Coast Guard and the Service.

As of the end of 1999 about 600 ships had reported into the ship reporting system for right whale feeding areas off Massachusetts and about 250 ships had reported into the system for the calving grounds off the southeastern U.S. coast. A detailed review of reporting results and compliance rates for both areas was expected to be available from the Coast Guard early in 2000.

Outreach efforts for shipping companies — To ensure awareness of the new reporting systems and the need for special precautions by ship operators, several articles on right whale protection efforts prepared by the National Marine Fisheries Service have been published in maritime shipping magazines. The Service also prepared inserts on the issue and the new reporting systems for addition to the *Sailing Directions* published by the National Imagery and Mapping Agency and *Guides for Port Entry* for the east coast ports of Boston, New York, Portland, Jacksonville, and Kings Bay. The Coast Guard and the National Marine Fisheries Service also began distributing a short film entitled *Right Whales and the Prudent Mariner*, produced by the International Fund for Animal Welfare. The film is being given to ships arriving in all major ports along the east coast, including ports adjacent to key right whale habitats, to ensure that vessel crews are familiar with right whales and applicable protection needs.

Based on a review of right whale protection needs at its 1996 annual meeting, the Marine Mammal Commission also recommended that the National Marine Fisheries Service work with major shipping companies operating in ports adjacent to key right whale habitats to encourage their cooperation in identifying and carrying out voluntary measures to reduce the risk of hitting right whales. For example, consistent with scheduling needs, shipping companies might direct their ships to provide extra time for using slow speeds when transiting areas where whales are most likely to occur, and government agencies could provide information and advice on means of avoiding collisions based on right whale movements and habitat-use patterns.

The Service was unable to fund the project in 1997 or 1998. However, with support from the Marine Mammal Commission, the Georgia Department of

Natural Resources, and Canada's Department of Fisheries and Oceans, the Service contracted for the project during 1999. The project is likely to involve shipping companies in Jacksonville, Florida, Boston, and St. John, Canada. By the end of 1999 the contractor had developed a list of possible actions shipping companies and government agencies might take, and arrangements were being made to discuss these points with shipping company officials.

NAVTEX communication capabilities — As noted above, one means of alerting ships to right whale locations has been the Coast Guard's NAVTEX communications network, a system of regional transmitters for sending text messages to ships. Although whale sighting locations are now sent through the mandatory ship reporting systems via INMARSAT, the NAVTEX system remains important for updating ships on new locations reported after they enter the reporting area.

In the southeastern United States, NAVTEX coverage has been available only for the southern portion of the right whale calving grounds. The Commission therefore wrote to the Coast Guard on 23 December 1997 recommending that a new NAVTEX transmitter be installed to cover the northern end of the area. At the Commission's 10-12 November 1998 annual meeting, a Coast Guard representative advised the Commission that funding had been obtained to install a new NAVTEX transmitter to fill the identified gap in coverage by mid-1999. On 27 October 1999 the new transmitter, located in Savannah, Georgia, began broadcasting, thereby eliminating the regional communications gap in the system.

Using active acoustics to detect right whales — During the winter of 1996-1997 the Navy tested the capability of passive listening devices (*i.e.*, hydrophones) to detect and locate vocalizing right whales in the species' calving ground. It was hoped that such technology could improve or supplement aerial surveys to locate whales and alert ships to whale positions. Unfortunately, the whales did not vocalize frequently enough to routinely locate their positions. On 10 July 1997 the Marine Mammal Commission commended the Navy for its efforts and suggested that it consider investigating active sonar, particularly

sonar buoys placed along ship channels, as a means of detecting whales.

The Navy expressed a willingness to consider such work, but stated that before doing any field work, it needed to review the technical and economic feasibility of possible approaches and the risks of displacing whales and other marine life from preferred habitats as a result of introduced sonar sounds. As noted in Chapter VII, the Commission subsequently worked with the Navy and other interested agencies to hold a workshop to consider the matter.

The workshop was held on 28 July 1999. Participants examined three possible applications of active acoustic technology: (1) ship-mounted sonars to detect whales far enough in front of ships to allow avoidance measures; (2) fixed bottom-mounted sonar arrays along shipping lanes or other high-risk areas to detect whales and provide transiting ships advance notice of whale locations; and (3) devices to produce sound that could alert whales to an approaching ship and cause them to move out of the way.

With regard to ship-mounted sonars, it was noted that tens of thousands of ships transit areas where right whales occur. Typical commercial ships traveling at moderate speeds (12-15 knots) could require two kilometers or more to stop and, considering the distance traveled in the several minutes that would be required to decide and initiate an appropriate response, it was noted that ship-mounted sonar would have to detect whales, especially those resting at or near the surface, at distances of 6 to 10 km. Although sonars used by naval combat ships to detect submarines typically have ranges of several kilometers, whales are smaller and harder to detect than submarines. Also, detecting objects at the surface poses particular technical problems. Navy participants advised that powerful sonars able to detect large targets at a range of 2 to 3 km would likely cost several million dollars to purchase and install plus additional operational costs. The participants therefore concluded that, at present, there is no reason to believe that hull-mounted sonars could provide a technically reliable and economically feasible means of preventing vessel collisions with right whales.

Workshop participants also considered two types of fixed sonar array systems: (1) multi-static systems in which low-frequency sound (below 15 kHz) transmitters are monitored by separate hydrophone arrays, and (2) distributed field arrays in which higher-frequency sounds (10 to 70 kHz) are both transmitted and received by individual bottom-mounted units oriented to detect objects overhead. For the latter system, effective detection distances are limited to about 1.5 to 2 times water depth. Both systems would require buried cables to connect sonar units to onshore power sources and monitors and would require 24-hr watches to detect, evaluate, and report sonar contacts.

Depending on the type, location, and size of the system, costs for purchasing and installing underwater hardware and for developing shore-based processing and display facilities could be tens of millions of dollars. Workshop participants concluded that, although technically feasible, fixed sonar arrays, even in restricted shipping channels, appeared unlikely to provide a practical means of preventing or reducing ship strikes. To help validate the tentative conclusion, it was suggested that a feasibility study be done to better assess the extent and costs of a fixed sonar array to detect and monitor whales in ship channels passing through the right whale calving grounds.

Finally, it was noted that further research was needed to evaluate the potential for using sounds to alert whales and elicit an avoidance response to approaching ships. To evaluate this possibility, participants concluded that available information on acoustic signatures of different ships should be evaluated to determine the distances in front of ships that whales at or near the surface should be exposed to sounds above threshold detection levels in the estimated right whale hearing range.

It was also concluded that studies should be done to evaluate whether and how different age and sex classes of right whales respond to sounds produced by vessels traveling at different speeds in different environmental conditions. If results of these studies suggest that whales are hit because (1) they hear approaching ships but respond too late to avoid collisions or (2) they cannot hear approaching ships, studies should be undertaken to determine if non-aversive sounds might be projected ahead of vessels to

ensure whales are aware of and have a greater opportunity to avoid the vessel.

A report of the meeting's findings, which is available from the Commission, was distributed to the participating agencies to help evaluate research needs.

Development of whale watching guidelines — In 1998 two whales were struck by commercial whale watching boats around Stellwagen Bank off Massachusetts. One, a minke whale, was killed and the other, a humpback whale, sustained a minor injury. In light of these accidents and the increasing number and speed of commercial whale watching boats operating in the northeastern United States, the Northeast Recovery Plan Implementation Team developed suggested revisions to a set of whale watching guidelines developed by the Service in 1985.

Intended specifically for whale watching off New England and to supplement existing federal and state rules that prohibit approaching right whales closer than 500 yards, the revised guidelines recommend that all whale watching boats slow to a speed no greater than 13 knots when within one to two miles of a whale. Between one and one-half mile of a whale, the guidelines recommend that approaching vessels slow to speeds of 10 knots. For species other than right whales that can be approached closer than 500 yards, they recommend that vessels (1) slow to 7 knots between one-half mile to 600 ft, and (2) maneuver to avoid head-on approaches to whales within 600 ft with no more than two vessels closer than 600 ft to the whale and only one vessel closer than 300 ft.

On 1 June 1999 the Service published a notice in the *Federal Register* announcing the availability of the team's suggested whale watching guidelines. In its notice the Service indicated that it planned to conduct a review of the guidelines to determine whether additional measures, such as regulations, would be needed to prevent harassment or injury of large whales in New England by whale watching vessels. At the end of 1999 it was the Commission's understanding that the Service had completed its review and expected to publish an advanced notice of proposed rulemaking early in 2000.

Assessment of ship collision risks — Identifying and evaluating possible measures to reduce the risk of collisions between ships and whales have been constrained, in part, by the limited information currently available on the occurrence of such events and the surrounding circumstances. To help address these needs, the Commission's staff, in cooperation with other marine mammal scientists, undertook a review to compile and analyze information from stranding records and anecdotal accounts of ship strikes involving right whales and other large whales.

Preliminary analyses of stranding records suggest that ship collisions are a substantial source of whale mortality in certain areas and that right whales, fin whales, humpback whales, sperm whales, and gray whales are the large whale species most frequently involved in such collisions. Ship collisions may be responsible for a third or more of the strandings of fin whales, as well as right whales, along the U.S. east coast, and about 20 percent or more of the strandings of southern right whales in South Africa, fin whales in France and Italy, and humpback whales off U.S. mid-Atlantic coastal states.

A compilation of more than 50 anecdotes describing collision events between ships and large whales suggests that all sizes and types of motorized vessels may hit whales. In most cases, whales were not seen before the collision or they surfaced too late to be avoided by the vessel. In many cases involving large vessels, the crew was unaware a whale had been hit until arriving in port with a whale caught on the bow.

These accounts suggest that efforts to detect whales by operators of large ships in order to maneuver around them will not be effective. The anecdotes also suggest that speed is a factor in collisions. In nearly all of the anecdotes in which the collision speed was reported and struck whales were known to have been killed or seriously injured, vessels were traveling at 14 knots or faster. Also, the first recorded ship collisions coincided with the development of vessels capable of traveling at speeds greater than about 13-15 knots and many of the earliest records involved the relatively few ships capable of those speeds. At the end of 1999 the analysis was being prepared for publication in a peer-reviewed journal.

Entanglement of Right Whales in the North Atlantic in Fishing Gear

The second known source of human-related right whale mortality is entanglement in commercial lobster traps and gillnets. Although only three right whale deaths have been attributed to this cause since 1970, including the entangled animal noted earlier that died in 1999, deaths due to entanglement may be under-represented in known mortalities. Analyses of photographs of entanglement-related scars on live animals suggest that more than 60 percent of the right whales in the western North Atlantic have been entangled at least once. It therefore appears that most entanglement incidents are relatively brief, with whales able to shed attached ropes and netting. However, some serious entanglements may not be observed. Several right whales in the population's photo catalogue were last seen with potentially fatal entanglements or related injuries and may have died undetected. Other entangled whales may drown under the weight of attached gear and anchors, and remain underwater where their discovery is unlikely. Attached gear also can restrict a whale's movements and increase its vulnerability to ship strikes; at least two whales killed by ships were entangled in fishing gear when hit.

To identify measures for reducing entanglement risks for right whales and other large whales off the U.S. Atlantic coast, the National Marine Fisheries Service established an Atlantic Large Whale Take Reduction Team on 6 August 1996. Pursuant to provisions of the Marine Mammal Protection Act, the team is charged with providing the Service a recommended plan to reduce the incidental take of large whales below the calculated potential biological removal levels of affected whale stocks within six months of the plan's implementation. The potential biological removal level is an estimate of the number of animals that could be removed from a stock annually (not including natural mortality) and still have assurance it would increase toward or remain at its optimum sustainable population level. Using a formula that incorporates estimates of population size and productivity, and a conservative recovery factor, the Service has calculated a potential biological removal level of zero for the western North Atlantic right whale population.

As discussed in previous annual reports, the team was unable to agree on all elements of a take reduction plan to reduce incidental taking to less than one right whale per year. Instead, it submitted a report to the Service on 3 February 1997 identifying areas of agreement and disagreement. Based largely on that report, the Service developed a proposed Atlantic Large Whale Take Reduction Plan that focused principally on northern right whales. Published in the *Federal Register* on 7 April 1997, the proposed plan included regulatory and non-regulatory measures. Among the regulatory provisions were seasonal fishery closures in times and areas where right whales are known to occur most often, and lists of gear design alternatives for lobster pots and gillnets. The gear design alternatives included features whose use was thought would reduce the risk of seriously entangling whales (e.g., buoys with break-away links or light lines from which whales might break free). Depending on the fishing location, gear would need to have one or more of the listed design alternatives. Other regulatory measures required that fishermen mark their gear to help identify the source of ropes found on entangled whales. Non-regulatory measures included funding to expand whale disentangling capabilities and research on new gear designs, public outreach efforts, and monitoring whales and fishing efforts within right whale habitats.

The plan proposed by the Service elicited strong opposition from the fishing industry, particularly with regard to proposed gear design requirements, which would have necessitated costly gear modifications. In many cases, it was not clear whether the proposed requirements would actually reduce entanglement risks; in other cases, there was concern that the functional integrity of fishing gear would be altered in ways that would increase the likelihood of its being lost. In its 5 June 1997 comments on the proposed plan, the Commission noted that many of the proposed gear modifications were untested or poorly tested, and it therefore recommended that most of the proposed gear requirements be deferred pending further research on their practicality and effectiveness.

To account for mitigation benefits foregone by deferring the gear modification provisions, the Commission also recommended that the time-area fishery closures proposed for two right whale critical habitats

off Massachusetts (*i.e.*, Cape Cod Bay and the Great South Channel) be strengthened. In both cases, most commercial fishing during the periods of peak whale occurrence were not included in the proposed closures. For example, right whales occur in greatest numbers in the Great South Channel in spring when most gillnetting occurs along a narrow band, called the "sliver" area, inside and adjacent to the western border of the area's critical habitat. The proposed closure for this critical habitat, however, did not include the sliver area. It therefore seemed doubtful that the closure would significantly reduce gillnet entanglement risks in this area, and the Commission recommended that the Service expand the gillnet fishery closure for the Great South Channel to encompass the entire right whale critical habitat, including the sliver area, pending further research on possible gear modifications and right whale habitat use patterns. The Commission made a similar recommendation for a closure of lobster fishing in Cape Cod Bay during the January to mid-May period of peak whale occurrence in that area.

On 22 July 1997 the Service published interim final rules to implement the Atlantic Large Whale Take Reduction Plan. In response to public comments received on the proposed rules, the Service revised the proposed gear design requirements to reduce the area in which the rules applied and to craft them in such a way that existing fishing gear could meet the gear specifications in most cases with little or no alterations. No changes were made to strengthen the proposed fishery closures as had been recommended by the Commission to compensate for relaxed gear requirements. The interim final rules became effective on 15 November 1997.

Based on experience gained under the interim final rules, the Service planned to publish final rules early in 1999. During 1998 under the interim final rules four whales were observed entangled; two were caught together in a fishing weir in Canada and released unharmed, one was seen entangled in unidentified gear in the Bay of Fundy in a situation that did not appear to be life-threatening, and one was badly entangled twice in lobster gear in Cape Cod Bay. The latter animal probably would have died had the gear not been removed both times.

Depending on where gillnet fishing occurred, the interim rules required gillnetters to use one or more gear design alternatives set forth in a list of seven. Each alternative was thought to reduce the risk of a serious whale entanglement by some uncertain degree. To finalize its rules, the Service considered eliminating three anchoring alternatives that had been listed in its interim rules to provide resistance capable of snapping weak links, which were listed as a separate gear specification alternative. However, because most fishermen used one of the anchoring types and because weak links were listed separately on its list of gear alternatives, the Service concluded that fishermen choosing only one or two options from its list could identify anchors as a selected option without also using weak links. Thus, what was done often would not further reduce entanglement risks. The Service also planned to ease its gear-marking requirements by making them applicable only in designated critical habitats, the Stellwagen Bank National Marine Sanctuary and Jeffreys Ledge (a fishing ground off northern Massachusetts).

On 7-8 February 1999 the Service reconvened the Take Reduction Team to review developments during the preceding year and plans for finalizing the rules. The team expressed concern about deleting the three anchoring provisions from the list of gear alternatives. It recommended that options for weak links be combined with the three anchoring alternatives. The team also expressed concern about the value and practicality of another listed gear design alternative — *i.e.*, the use of buoy line 7/16ths of an inch thick or less. Some team members thought that this specification was not practical for offshore lobster gear, while others questioned whether line 7/16ths of an inch thick could be broken easily by a whale. The latter concern was subsequently reinforced by the death of a right whale (#2030) entangled in 7/16th-inch line. The team also expressed concern about the value and practicality of the gear-marking requirements and recommended that these provisions be deferred until November 1999 to allow further evaluation.

On 16 February 1999 the Service published final rules for its take reduction plan. The adopted changes deleted the three anchoring specifications from the list of gillnet gear alternatives, but did not incorporate them in the provision for weak links as discussed by

the team. The final rules also retained the use of buoy line 7/16ths of an inch or less on the lists of gear options for lobster traps and gillnets and eased the gear-marking requirements by making them applicable only in critical habitats, the Stellwagen Bank National Marine Sanctuary, and the Jeffreys Ledge fishing area. The final rules became effective on 1 April 1999.

As noted above, during 1999 three whales were observed entangled in the Great South Channel in spring; at least one of these was seriously entangled in gillnet gear and eventually died. Experience during 1999 demonstrated that, although disentanglement efforts were important and helpful, it was not always possible to quickly relocate entangled whales seen offshore and disentangle them. Believing that additional steps were needed to prevent entanglements in the first place, and that efforts in this regard should be directed toward preventing entanglements in areas where right whales are known to be concentrated, the Commission wrote to the Service on 1 October 1999 recommending that the Service (1) immediately initiate steps to expand the gillnet fishing closure in the Great South Channel such that it applies to the area's entire critical habitat by next spring, and (2) consider extending the closure to waters immediately adjacent to, but outside the western border of critical habitat to provide a wider buffer between predictable right whale concentrations and gillnet fishing.

The Commission also noted that right whales can and do become entangled throughout their range and that seasonal closures are not appropriate at every location where right whales may occur. However, the Commission also expressed the view that more should be done to address entanglement risks in areas other than designated critical habitats. The Commission recommended that the Service develop a flexible regulatory measure as part of the Atlantic Large Whale Take Reduction Plan to allow the agency to promptly and temporarily suspend gillnet and lobster fishing in any area where a concentration of right whales is observed until the whales have left that area.

Because of the steps required to promulgate rules for fishery closures and the recommendation to modify time-area closures for the Great South Channel by next spring, the Service was asked to advise the

Commission of steps being taken to address its recommendations at the Commission's 19-21 October 1999 annual meeting. During that meeting, the Service indicated that it had not yet decided whether to proceed with the recommended rulemaking and that it hoped to reconvene the take reduction team early in 2000 to seek its advice on additional actions to reduce entanglement risks for right whales. Concerned that this delay would preclude action to expand the gillnet fishing closure by next spring, the Commission wrote to the Service on 23 November 1999, again recommending that immediate steps be taken to expand the boundary of the spring gillnet fishing closure in Great South Channel.

On 16 December 1999 the Service responded to the Commission's letters noting that it shared the Commission's concern about the effectiveness of the Atlantic Large Whale Take Reduction Plan in light of the number of recent right whale entanglements. In addition to reconvening the Atlantic Large Whale Take Reduction Team early in 2000, the Service noted that it was evaluating recent right whale sighting data from the sliver area, as well as other high-use areas, to help define boundaries where possible closures or additional restrictions on lobster and gillnet fisheries might be warranted. The Service also noted that flexible management measures were being considered to open and close fishing areas in response to the identification and movement of right whale concentrations, and that this would be discussed during the forthcoming Atlantic Large Whale Take Reduction Team meeting.

Funding for Right Whale Recovery Work

During its annual meetings in 1996 and 1998 the Marine Mammal Commission and its Committee of Scientific Advisors conducted in-depth reviews of right whale recovery work being undertaken by the National Marine Fisheries Service and other agencies and groups. The reviews indicated that funding was not sufficient to carry out many important recovery tasks. In some cases, essential ongoing work was either less complete and exhaustive than needed or it had to rely on unpredictable private funding sources (e.g., monitoring right whales in known high-use habitats, developing gear design alternatives less likely to entangle whales, and efforts to disentangle individu-

al whales). In other cases, funding was insufficient to initiate needed work (*e.g.*, developing tagging programs to identify unknown habitat use patterns and investigating factors relating to vessel noise that may prevent whales from detecting and avoiding ships).

To help address chronic underfunding problems, the Commission wrote to the Service on 12 December 1996 recommending that it establish a conservation fund supported by private and industry sources, such as shipping companies and whale watching operations, to supplement normal appropriations. The Service expressed an interest in working with the Commission on the idea, as did Senator Judd Gregg of New Hampshire. The National Fish and Wildlife Foundation operates several funds that help support wildlife conservation work and, during the summer of 1997, Senator Gregg asked the Commission to consult with the Foundation to help draft a bill to establish a conservation fund that could be used to supplement support for research and management work on whale populations of the United States, particularly highly endangered species such as the northern right whale.

Based on those consultations, Senators Gregg and Ted Stevens of Alaska introduced a bill, S. 2172, to establish the National Whale Conservation Fund. Subsequently attached to an appropriation bill passed by Congress on 19 October 1998, the bill authorizes the Foundation, in consultation with the Marine Mammal Commission and the National Oceanic and Atmospheric Administration, to establish a separate interest-bearing account called the National Whale Conservation Fund. To generate income for the fund, the Foundation may accept gifts and bequests from any source, and enter into agreements for the design, production, and marketing of logos, seals, decals, and other items. For example, fund administrators could enter into voluntary agreements with whale watching operators to use a fund logo for advertising in return for a commitment to donate a nominal non-taxable amount from ticket sales (*e.g.*, \$1 per ticket).

During 1999 the Commission contracted for the development of draft documents to help guide fund operations. However, as neither the Foundation, the National Marine Fisheries Service, nor the Commission had money to cover initial start-up and operating costs necessary to advertise and solicit contributions,

final documents to guide operation of the fund were not adopted, and no contributions were solicited for the fund during 1999.

With two right whale deaths due to human causes and a record low four births observed during 1999, the need to increase support for recovery activities took on added urgency. To address this need, Congress, at the behest of Senator Gregg and several non-governmental groups, including the New England Aquarium, the Center for Coastal Studies, and the International Fund for Animal Welfare, appropriated \$4.1 million to the National Marine Fisheries Service for work in fiscal year 2000 on right whale recovery. Included in an appropriation bill passed on 16 October 1999, the right whale appropriation is nearly twice the funding levels provided by the Service in recent years for right whale work and it far exceeded the agency's \$200,000 request for right whales. In appropriating these funds, the Senate Appropriations Committee expressed its understanding that the Service would make \$250,000 available to the National Fish and Wildlife Foundation to help start up the National Whale Conservation Fund and that allocation of the remaining funds would include \$750,000 for gear research, \$1.15 million for early warning surveys and acoustic studies, \$450,000 for reproductive research, \$600,000 for habitat monitoring and population studies, and \$650,000 for tagging studies to better determine habitat-use patterns.

Following detailed reviews of right whale recovery activities at its annual meetings in 1996 and 1998, the Commission wrote to the National Marine Fisheries Service identifying and recommending further work in many of the areas noted by the Senate Appropriations Committee. These recommendations, set forth in letters of 12 December 1996 and 21 December 1998 and described in previous annual reports, noted needs with regard to developing a right whale tagging program, increasing support for research on whale-friendly fishing gear designs, disentangling right whales, monitoring right whales in key habitats, and investigating factors related to collisions with ships. Many of the actions had not been fully addressed and therefore, in its 23 November 1999 letter to the Service on expanding fishery closure rules for the Great South Channel, the Commission asked the Service to reexamine the recommendations in those

letters while developing a fiscal year 2000 spending plan for right whales and to advise the Commission on actions that will be taken to address them.

Right Whale Litigation

A number of lawsuits filed by the national campaign director of GreenWorld alleging various violations of the Marine Mammal Protection Act, the Endangered Species Act, and other laws have been important in shaping actions by the National Marine Fisheries Service, the Coast Guard, and others to protect northern right whales. While several of these cases remained active during 1999, the only noteworthy development was the issuance of a ruling on 30 September 1999 in *Strahan v. New England Aquarium* by the U.S. District Court for the District of Massachusetts. This case, filed in 1997 against the Aquarium and two other operators of whale watching tours, alleged violations of the Endangered Species Act, the Marine Mammal Protection Act, the Whaling Convention Act, and Massachusetts State law. Although the lawsuit was brought "on behalf of" six species of whales, its primary focus was on the right whale.

The plaintiff alleged that the whale watching operations at issue involved the pursuit of, and intentional close approaches to, right whales and resulted in takings in violation of the Endangered Species Act and the Marine Mammal Protection Act. The plaintiff further argued that such activities violate the Whaling Convention Act, which prohibits unlicensed whaling operations. The lawsuit also claimed that conducting whale watching operations in areas designated as right whale critical habitat constituted an impermissible modification of that habitat in violation of the Endangered Species Act. The claim under state law alleged that the whale watching operations violated the Massachusetts Civil Rights Act by interfering with the plaintiff's right to conduct research on and experience right whales and the five other species.

In response to a motion from the defendants to dismiss the case, the court ruled that the claims arising under the Marine Mammal Protection Act and the Whaling Convention Act were barred, inasmuch as neither statute contains a citizen-suit provision authorizing a private cause of action. Therefore the claims arising under these statutes were dismissed for

lack of jurisdiction. The cause of action under Massachusetts law was also dismissed because the plaintiff had failed to allege any specific facts to support his claim that the defendants had engaged in threats, intimidation, or coercion to deny him the exercise of rights recognized in that law. Such action on the part of the defendants is a required element of a claim under the applicable statute. The claims arising under the Endangered Species Act survived the motion to dismiss and were considered by the court in response to a motion for preliminary injunction filed by the plaintiff. As noted by the court, an injunction under the Endangered Species Act cannot be based solely on the possibility that an endangered species may be disturbed; the plaintiff must show that harm or harassment actually has occurred.

Based on the record before it, the court found that the plaintiff had failed to show that the defendants' whale watching activities pose a significant threat of killing or injuring whales. Contrary to the plaintiff's claims, it appeared to the court that whale watching operators could identify right whales at a considerable distance based on their distinctive v-shaped blow and lack of a dorsal fin, and vessels could maintain the required 500-yard distance from these whales. Further, the court found no credible evidence that the whale watching vessels operated by the three defendants had ever collided with, injured, or killed a whale. The court also found that the plaintiff was highly unlikely to succeed on the merits of the claim arising from alleged habitat modification. After considering the competing views, the court determined that most scientists are in agreement that responsible vessel activity does not appear to adversely affect whale behavioral patterns or their overall habitat. Consistent with these findings, the court denied the request for a preliminary injunction.

Bowhead Whale (*Balaena mysticetus*)

Bowhead whales are found only in seasonally ice-covered waters of the Arctic and sub-Arctic areas where they occur in several discrete stocks. All were severely depleted by commercial whaling prior to the 20th century. Since the mid-1900s bowhead whales

have been classified as a protected stock by the International Whaling Commission.

The largest remaining stock, and the only one found in U.S. waters, is the western Arctic stock, also referred to as the Bering/Chukchi/Beaufort Seas stock. This stock currently is estimated to number about 8,000 animals, compared with an estimated 5,000 individuals in 1978. The other bowhead stocks are found in the Okhotsk Sea off eastern Russian, in the Baffin Bay/Davis Strait region and in Hudson Bay in northeastern Canada, and in the eastern Arctic off eastern Greenland, Norway, and northwestern Russia. All number in the hundreds or fewer and show no signs of recovery.

The western Arctic stock spends winter months in the Bering Sea, presumably using polynyas and other open-water areas within the seasonal pack ice. With the retreat of the sea ice in spring, bowhead whales migrate along the western and northern coasts of Alaska to feeding areas in the eastern Beaufort Sea and, to a lesser extent, in the Chukchi Sea. In fall they make a return migration that takes them eastward, then south through the Bering Strait. During the spring and fall migrations, bowhead whales are hunted by Alaska Natives from 10 coastal villages. The hunts, part of a centuries-old subsistence whaling tradition, are major cultural events and an important source of food for these villages. Similarly, Chukotka Natives in the Russian Far East have traditionally taken bowhead whales for subsistence purposes; however, the harvest was suspended for some 25 years under the Soviet regime. Recognizing the cultural and subsistence importance of such hunts, the International Whaling Commission (IWC) has adopted an aboriginal whaling regime under which it has established recommended quotas for subsistence hunting, including quotas for bowhead whales hunted by Alaska and Chukotka Natives.

Native Subsistence Whaling in Alaska and Russia

Recommended quotas for aboriginal subsistence whaling are established by the IWC at the request of member nations. Quotas for protected stocks are set at a level that will allow the stocks to recover while

meeting the documented needs of the affected Native communities. Member nations are responsible for implementing the recommended quotas.

In the United States, bowhead whale quotas are implemented by regulation and under a cooperative agreement between the National Oceanic and Atmospheric Administration and the Alaska Eskimo Whaling Commission — a Native organization established to represent and oversee whaling by Alaska Native whalers. Among other things, the Eskimo Whaling Commission allocates quotas among the whaling villages in Alaska and works to improve the safety and efficiency of Native subsistence whaling.

At the request of the United States and the Russian Federation, in 1997 the IWC set a five-year block quota of 280 bowhead whales for the western Arctic stock. The quota, which applies from 1998 through 2002, reflects a decision by the Russian Federation to seek authority for Chukotka Natives in eastern Russia to resume the take of small numbers of bowhead whales for subsistence purposes.

Under the five-year block quota, Natives in Alaska and Chukotka may strike up to 67 bowhead whales each year, with up to 15 strikes unused during a particular year carried over to the next year and added to the 67-strike quota.

In June 1998 representatives of the United States and the Russian Federation signed an agreement specifying the steps to be taken to ensure that the taking of bowhead and gray whales for subsistence purposes does not exceed the catch limits established by the IWC. Under the agreement, Russian Natives were allocated up to 7 bowhead whale strikes in 1998, and Alaska Natives were allocated up to 75, including 15 authorized but unused strikes carried over from the previous year.

During the 1998 whaling season, Alaska Natives used 54 of the allocated 75 strikes, and Chukotka whalers took one bowhead whale. Therefore, 15 unused strikes were again carried over, and for 1999 75 strikes were again allocated to the Alaska Natives and 7 to the Chukotka Natives. The annual numbers of strikes and landings by Alaska Natives since 1973 are shown in Table 2. In 1999 Chukotka Natives

Table 2. IWC quotas¹ and number of bowhead whales taken by Alaska Natives, 1973–1999

Year	Quotas ² (Landed/ Struck)	No. 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	—/43	12	13	25	48
1985	—/26	11	6	17	65
1986	—/26	20	8	28	71
1987	—/32	22	9	31	71
1988	—/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
1995	—/68	43	14	57	75
1996	—/77	39	5	44	89
1997	—/76	48	18	66	73
1998	—/82	41	13	54	76
1999	—/82	42	5	47	89

¹ Cited quotas established by the International Whaling Commission; data on numbers of whales landed, struck but not landed, and total struck are from R. S. Suydam, R. P. Angliss, J. C. George, S. R. Braund, and D. P. DeMaster. 1995. Revised data on the subsistence harvest of bowhead whales (*Balaena mysticetus*) by Alaska Eskimos, 1973–1993. Forty-fifth report of the International Whaling Commission 45:335–338. Information for the years 1994, 1995, 1996, 1997, 1998, and 1999 was provided by the National Marine Fisheries Service.

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

again reported taking only one bowhead whale. The number of animals struck but not landed by Chukotka Natives, if any, is not yet available.

The two groups plan to continue to confer on allocating the 2000 quota and monitoring the take, including any strikes that may be carried forward from 1999.

Native Subsistence Whaling in Canada

In addition to bowhead harvests by Alaska and Russian Natives, seven bowhead whales were taken by Natives in Canada between 1991 and 1998. The Canadian harvest differs from the Alaska and Russian harvests in two significant ways. First, Canada withdrew from the IWC in 1982 and, since that time, has neither sought nor obtained recommended quotas from the IWC before licensing its Natives to hunt bowhead whales. Second, at least three of the whales taken in the past several years have been from the highly endangered bowhead stocks in eastern Canada.

Under the Pelly Amendment to the Fisherman's Protective Act, the Secretary of Commerce is required to formally notify the President of actions by a nation that diminish the effectiveness of any international fishery conservation program. The President is authorized, but is not required, to restrict the import of fish or any other products from nations so certified. He is required to notify Congress within 60 days of actions taken in response to certification.

Despite the expressed concerns of the IWC and others, in 1996 Canada issued two licenses under which two bowhead whales were taken. In response, on 12 December 1996 the Secretary of Commerce certified to the President that Canada's actions were diminishing the effectiveness of the IWC's conservation program, and the President on 10 February 1997 advised Congress that actions against Canada were warranted to bring about compliance with the IWC's conservation program. Toward this end, he instructed the Department of State to oppose Canadian efforts to address issues on the hunting and trade of marine mammals within the Arctic Council (see Chapter V). The President also advised Congress that he had instructed the Secretary of Commerce to withhold

consideration of any Canadian request for a waiver of the Marine Mammal Protection Act's moratorium on importing seals or seal products into the United States.

In 1997 Canadian Natives neither requested licenses nor took any bowhead whales. However, in 1998 Canada issued a license and on 20 July Native whalers took a bowhead whale from the highly endangered eastern Canadian stock. After learning of the take, the Department of State conveyed to the Canadian government its continuing belief that these actions diminished the effectiveness of the IWC conservation program. It also advised Canada that the United States would continue to oppose Canadian efforts to address marine mammal trade within the Arctic Council until Canada either rejoins the IWC or complies with the IWC's aboriginal whaling regime.

The IWC is also concerned about the need to safeguard small populations of large whales, including the eastern Canadian stocks of bowhead whales, that are highly endangered as a result of past over-exploitation. At its meeting in Grenada in May 1999, the IWC passed a resolution calling on nations to refrain from authorizing any further takes from these stocks until it can be demonstrated that such takes will not threaten the survival or recovery of these populations. A copy of the resolution was to be forwarded to Canada (see the IWC section in Chapter V).

During 1999 Canadian Natives neither requested licenses nor took any bowhead whales. However, because Canada has not rejoined the IWC or indicated that it no longer will authorize its Natives to hunt bowhead whales, the Presidential directive that followed the Pelly Amendment certification imposed in 1996 remains in effect.

Gray Whale (*Eschrichtius robustus*)

Gray whales live only in the North Pacific Ocean, where they occur in two discrete stocks. One stock, the eastern North Pacific (or California) stock, undertakes one of the longest annual migrations of any mammal. Moving between winter calving lagoons off Baja California, Mexico, and summer feeding grounds

in the Bering and Chukchi Seas between Alaska and Russia, some migrating California gray whales may travel up to 10,000 miles during a round trip. The other stock of gray whales, the western North Pacific (or Asian) stock, migrates seasonally between winter calving areas along the coasts of China and Korea and summer feeding grounds in the Okhotsk Sea off eastern Russia.

Both stocks were severely depleted by commercial whaling in the mid-1800s and early 1900s. Because of their precipitous decline, gray whales, along with right whales, were the first whale species to receive protection from commercial whaling under an international ban adopted by the League of Nations in the mid-1930s. Although the Soviet Union and Japan were not members of the League, the Soviet Union subsequently signed the 1946 International Convention for the Regulation of Whaling under which the ban was extended, and Japan acceded to that Convention in 1951. Under these protective measures, the eastern North Pacific gray whale stock has made a substantial recovery, the western stock has not.

The eastern stock was thought to have been reduced to a few thousand animals when the ban on commercial whaling for gray whales first went into effect. To monitor the population size and trend, the National Marine Fisheries Service has surveyed gray whales on their southward migration in 19 of the past 33 years. Throughout this period the population increased steadily. Based on results of the most recent survey, conducted in 1997-1998, the population currently is estimated to number 26,600 whales, a level thought to be within its optimum sustainable population range or perhaps just below it. Since 1994 the Service also has surveyed whales migrating northward to assess calf production. Results through 1998 indicate that calves have accounted for between 2.6 and 6.5 percent of the population.

The western stock was subject to coastal whaling that may have begun in Japan in the 1500s. As a result, the western stock may already have been reduced in size by the time modern commercial whaling began in the mid-1800s. Although its abundance in the 1930s is not known, the western stock may have numbered in the low hundreds or fewer at that time, and whalers from nations not members of

the IWC continued to take whales — despite the ban — until at least the 1960s. Currently it may number about 100 animals.

In light of their precarious status, gray whales were listed as endangered throughout their range under the U.S. Endangered Species Conservation Act of 1969, the predecessor to the Endangered Species Act of 1973. Because of the eastern stock's recovery, the species' status under the Endangered Species Act was modified in June 1994. The change removed eastern North Pacific gray whales from the list of endangered and threatened wildlife but retained the western stock as endangered.

Gray whales typically migrate, calve, and rear their young within a few miles of shore, and feed over the continental shelf. As a result, they are exposed to the effects of various human activities that tend to be concentrated near shore. Some whales are killed or injured as a result of entanglement in coastal gillnets or collisions with ships. Their behavior, habitat use patterns, and health also may be affected by noise, contaminants, or other human activities and development, including offshore oil and gas development, coastal development, whale watching, military exercises, and industrial facilities. Eastern North Pacific gray whales also are taken to meet Native subsistence needs. Although subsistence hunts occur in both Russia and the United States, more than 95 percent of the whales are taken in Russia.

The National Marine Fisheries Service is the lead federal agency responsible for the conservation of eastern North Pacific gray whales under authority of the Marine Mammal Protection Act and for western North Pacific gray whales under both that Act and the Endangered Species Act. Recent activities related to their conservation are discussed below.

Gray Whale Strandings in 1999

During the first nine months of 1999 nearly 270 gray whales stranded along the west coast of North America from Alaska to Mexico. This was about five times the number of such strandings in any previous year on record, and the occurrences precipitated consultations between the National Marine Fisheries Service and the Working Group on Marine Mammal

Unusual Mortality Events, a group formed pursuant to Title IV of the Marine Mammal Protection Act to provide advice with regard to responding to unusual marine mammal mortalities. To prepare for the possibility that high numbers of gray whale strandings would continue in 2000, the Commission wrote to the Service on 10 December 1999 recommending that steps be taken to complete a die-off response plan immediately. Information on the unusual number of gray whale strandings in 1999 and actions taken to investigate the cause are discussed in Chapter VI.

Five-Year Status Review

The eastern North Pacific stock of gray whales was removed from the Endangered Species Act list of endangered and threatened wildlife on 16 June 1994. To help ensure that such actions are prudent, the Act requires that the responsible agency monitor the species' status for at least five years after delisting. To meet this provision for the eastern North Pacific gray whale stock, the National Marine Fisheries Service drafted a five-year research and monitoring plan on which the Commission commented in July 1994. In part, the plan proposed a series of annual counts of gray whales migrating along the California coast. In its July 1994 comments on the draft plan, the Commission recommended that the plan be expanded to identify and assess activities that could affect the principal winter calving lagoons in Baja California and feeding grounds in the Bering and Chukchi Seas. Although never finalized, the draft plan has provided a framework for guiding research activities carried out over the past five years. In addition to survey counts and other research conducted by the National Marine Fisheries Service, many other researchers in the United States and Mexico also have undertaken relevant monitoring studies.

On 16-17 March 1999 the Service convened a workshop to review the results of its five-year research program as well as other information bearing on the status of eastern North Pacific gray whales. The objectives of the workshop were to determine whether steps should be taken to relist the stock as threatened or endangered, and if monitoring efforts should be continued for another five-year period. The results and findings of the workshop were summarized in an August 1999 report prepared by the Service.

With regard to the stock's status under the Endangered Species Act, participants concluded that the eastern North Pacific stock did not meet established criteria for listing as either threatened or endangered and that no action was warranted to relist it under the Act. Monitoring studies indicate that the stock continued to increase after it was delisted. When the stock was delisted in 1994, it was estimated to number 23,100 whales. Based on the most recent analysis of stock size, which was derived from counts along the California coast during the stock's southbound migration in the winter of 1997-1998, it is estimated to number 26,635 whales, with a 95 percent confidence interval ranging from 21,878 to 32,427. Modeling analyses indicate that the stock has increased at an average rate of about 2.5 percent per year since the late 1960s.

Workshop participants also recommended that monitoring studies be continued for another five-year period (*i.e.*, 1999-2004). In support of this recommendation, the participants noted that information on the stock's status would be needed by both the Service and the International Whaling Commission to meet upcoming stock assessment responsibilities, and that there is considerable public concern about the status of gray whales. They also noted that the stock's annual migration along highly populated coastlines makes it vulnerable to impacts from human activities and industrial facilities and should continue to be monitored. In addition, it was noted that the population offers a rare opportunity to document the recovery of a population of large whales from near-extinction through return to its carrying capacity level. In light of the ease and convenience with which the stock can be studied, further monitoring also would allow the investigation of cetacean life history parameters that are far more difficult to study in almost all other whale populations.

With regard to future monitoring efforts, workshop participants identified and ranked priority research needs. In decreasing order of priority, they recommended that (1) annual surveys of whales migrating southward along the California coast be continued to monitor population size, (2) studies of gray whales and the effects of human activity and development in winter calving and nursing lagoons in Mexico be continued, (3) photogrammetry studies be undertaken to

assess the condition of whales, (4) calf counts at selected sites in California and Mexico be continued, and (5) surveys be undertaken in the Bering and Chukchi Seas to examine the effects of environmental parameters, particularly climate warming, on whale foraging patterns.

During the Marine Mammal Commission's 19-21 October 1999 annual meeting, representatives of the Service provided information on the status of eastern North Pacific gray whales. Although noting that workshop participants had recommended that efforts to monitor this stock be continued for another five-year period, the Service advised the Commission that it had neither committed funds to do so nor had it made plans to continue cooperative work with Mexican officials to ensure that critical calving and nursing lagoons are not degraded by development. In light of this information, the Commission wrote to the Service on 10 December 1999. Noting the importance of detecting any downturn in future population growth and the value of further population data for developing models to assess recovery patterns of other large whale populations, the Commission recommended that the Service provide funds to continue its gray whale monitoring program.

Specifically, the Commission recommended that the Service (1) continue counts of adults and calves and photogrammetry studies during northbound migrations for at least the next three years at a cost of \$65,000-\$75,000 per year, (2) conduct another population count during the southbound migration in 2001 at a cost of about \$60,000, and (3) continue to assist Mexican scientists with efforts to prevent degradation of critical calving and nursing lagoons in Baja California, Mexico. As of the end of the year, the Service had not yet responded to these recommendations.

Subsistence Take of Gray Whales

As noted above, gray whales are taken for Native subsistence purposes in both Russia and the United States. Between 1966 and 1991, an average of 177 gray whales was taken annually for this purpose, almost all in Russia. Between 1994 and 1998, the take of gray whales ranged from 42 to 122 whales. During that period only two gray whales were taken in the United States, both by Alaska Natives in 1995.

The International Whaling Commission (IWC) is responsible for setting catch limits for aboriginal subsistence whaling. The current quota for gray whales, adopted in 1997, was established as a five-year block quota of 620 whales, with no more than 140 whales landed in any one year. Under a subsequent bilateral agreement between Russia and the United States, Russia agreed to limit its take to 135 whales and the United States agreed to limit its take to 5 whales.

In May 1995 the Makah Tribal Council of Washington State expressed an interest to the Departments of Commerce and State in renewing a hunt for gray whales. Whaling had been a traditional part of the tribe's way of life for more than 1,000 years until it ceased in the 1920s when gray whales became scarce as a result of depletion by commercial whalers. Citing its whaling rights under the 1855 Treaty of Neah Bay, the tribe asked that the agencies seek approval from the IWC for an annual ceremonial harvest of up to five gray whales. The agencies agreed, and a proposal to take five whales per year was put forward to the IWC at its 1996 meeting. The proposal raised questions about the purpose and need for the take, and at the tribe's request, it was withdrawn to develop additional background information.

A new proposal for an annual harvest of up to five whales, augmented with additional background information, was submitted to the IWC for consideration at its 1997 meeting. At that meeting, the IWC adopted a resolution proposed jointly by the U.S. and Russian delegations approving the above-mentioned five-year block quota and noting that "meat and products of such whales are to be used exclusively for local consumption by the aborigines whose traditional subsistence and cultural needs have been recognized." With regard to the gray whale quota, the Russian Federation agreed to take no more than 135 whales per year, leaving five whales available to be taken by Makah whalers. Although the U.S. delegation interpreted the resolution as recognition of the Makah's cultural and subsistence needs, some delegations questioned that interpretation and contended that the Makah were not entitled to hunt gray whales.

A lawsuit was subsequently filed against the Department of Commerce on 17 October 1997 by

Rep. Jack Metcalf of Washington State and several environmental groups. The suit challenged the Department's actions to promote and authorize whaling by the Makah. A ruling in the case, issued on 21 September 1998 by the district court for the Western District of Washington, granted the federal defendant's motion for summary judgment and cleared the way for Makah whaling to begin. The court found that the Makah Tribe had a cultural and subsistence need for whaling and that the Secretary of Commerce's approval of the quota did not violate the International Convention for the Regulation of Whaling, the Whaling Convention Act, or applicable regulations.

In 1998 the Makah Whaling Commission adopted a management plan to govern whaling by the tribe during the years 1998-2002. Among other things, the plan calls for issuing permits to tribal whalers, limiting the harvest to landings of no more than five gray whales per year, targeting only migrating adult whales not accompanied by a calf, using specified hunting methods, and using landed whales only for traditional handicrafts, consumption by local residents, and ceremonial purposes. A few gray whales apparently remain throughout the summer to feed in Puget Sound, where Makah whaling was to take place. To help prevent hunting of these few summer resident whales, the National Marine Fisheries Service wrote to the Makah Tribal Council on 6 March 1998 expressing its understanding that hunting would occur only from early November through the end of June or at other times when the Service and the tribe determined that gray whales were migrating.

Notwithstanding these actions, Makah whalers made no attempts to hunt gray whales during 1998. In the spring of 1999, however, Makah whalers put to sea in a cedar canoe accompanied by a motorized chase boat to renew the tribe's whaling tradition. From its initial announcement of an intent to resume a hunt for gray whales, the Makah's whaling plans have been the focus of sharp criticism and intense protest by people opposed to the killing of whales and concerned that the action could set a precedent for the resumption of other whaling. When the legal action noted above failed to block the tribe's plans, anti-whaling activists attempted to prevent the hunt by running boats between the tribe's whaling canoe and

targeted whales. This prompted the arrests of several activists by the Coast Guard early in May 1999 at the start of the hunt. With a close Coast Guard vigil, however, the hunt continued. After one whale struck a glancing blow by a harpoon escaped alive in early May, Makah whalers succeeded in killing and landing a gray whale on 17 May 1999. That whale was the only one landed by the Makah Tribe during the year.

Potential Threats to Gray Whale Calving and Nursing Lagoons

As noted above, eastern North Pacific gray whales migrate southward to coastal waters along the western shore of Mexico's Baja California Peninsula each winter. There, a series of coastal bays and lagoons (principally Magdalena Bay, Laguna San Ignacio, Ojo de Liebre, and Guerrero Negro) provide protected waters where pregnant females give birth and nurse their young before returning to northern feeding grounds. With the exception of Guerrero Negro, where a salt evaporation facility has been operating since the 1950s, the bays are largely undeveloped. In 1976 three of the coastal lagoons (San Ignacio, Ojo de Liebre, and Guerrero Negro) were designated by Mexico as the Whale Sanctuary of El Vizcaino. In 1988 they also were designated as the Vizcaino Biosphere Reserve, part of a United Nations system of internationally significant natural areas, and in 1993 they received further recognition and protection as a Natural World Heritage Site.

In recent years, development proposals have been made that could significantly affect the whales' use of two of the stock's most important calving lagoons. In 1994 Mitsubishi and the Mexican government, through a joint venture known as Exportadora de Sal, S.A. (ESSA), proposed locating a large salt evaporation facility on the shores of Laguna San Ignacio, and in the mid-1990s a Japanese consortium proposed a 2,000-ha tourist resort on Magdalena Bay. As noted in past annual reports, the Marine Mammal Commission has followed the proposed projects to identify ways to prevent adverse effects on key components of the eastern North Pacific gray whale habitat.

Perhaps the greatest threat to the stock's winter habitat is the proposal for a salt evaporation facility at

Laguna San Ignacio. The importance of the lagoon for gray whales and the potential effects of the proposal have prompted a high level of concern in Mexico and internationally. As initially proposed, this project would involve constructing 116 square miles (300 sq km) of evaporating ponds along the lagoon's shoreline, building a 1.25-mile-long (2 km) pier for transporting salt to ocean-going ships, and installing pumps to siphon 6,000 gallons (22,710 liters) of seawater per second from the lagoon into the evaporation ponds. Barge traffic and noise from the facility could disrupt and displace calving and nursing whales, and spills of fuel, brine, or other chemicals could pose pollution risks.

Although inclusion of the lagoon in the Vizcaino Biosphere Reserve serves to recognize the importance of the area's natural resources, including gray whales, the lagoon is within a reserve buffer zone where development could be permitted if it is consistent with the reserve's conservation objectives. In 1995 the Mexican environmental secretariat (SEMARNAP) reviewed an environmental impact assessment for the project prepared by the developers and rejected the proposal on grounds that it was incompatible with objectives of the biological reserve. After initially appealing the finding, Mitsubishi and ESSA withdrew the proposal and announced plans to redesign the project and develop a new environmental assessment.

To help clarify needs with regard to redesigning and preparing a new environmental impact assessment, SEMARNAP, with advice from the International Whaling Commission, established an international science advisory committee to develop terms of reference to be addressed in the new environmental impact statement. The committee requested and reviewed public comments on its task, and in July 1996 it completed work on its terms of reference. Since that time, Mitsubishi and ESSA have been preparing a new environmental impact statement based, in part, on the committee's advice. The new statement was expected to be completed in 1998, but has been delayed several times. As of the end of 1999 it was the Commission's understanding that the new statement had not yet been forwarded to SEMARNAP for review.

In addition to SEMARNAP's review, the lower house of the Mexican Congress established a 12-member commission in 1998 to examine environmental impacts associated with both the existing salt evaporation facility at Guerrero Negro, which is also operated by Mitsubishi and ESSA, and the planned facility at Laguna San Ignacio. The Mexican commission was to have one year to complete its review and submit its findings to the President of Mexico. At the end of 1999 the report had not yet been completed.

The proposed tourist development for Magdalena Bay also has been deferred, but not withdrawn. The deferral may be related to the recent economic recession in Japan and could be revived depending, in part, on improvements in the Japanese economy.

Western North Pacific Gray Whale Stock

As noted above, a separate, very small stock of gray whales also occurs in the western North Pacific Ocean off the coast of Asia. In the decades following adoption of a ban on hunting gray whales in the mid-1930s, the stock's survival was uncertain. In the 1980s Russian scientists confirmed that a few tens of animals still occurred on summer feeding grounds off Russia's Sakhalin Island in the west-central Okhotsk Sea. Although commercial hunting of gray whales is prohibited, the stock's migration along the coasts of Japan, China, and Korea — one of the world's most heavily populated and industrialized shorelines — exposes surviving individuals to risks of entanglement in fishing gear, collisions with ships, and pollution. Recently, the discovery and rapid development of large oil and gas deposits off the coast of Sakhalin Island have posed new threats from associated noise, pollution, and ship traffic in the stock's only known summer feeding ground.

A cooperative research program involving both Russian and U.S. scientists was started in 1995. Although no research was done in 1996, the studies were renewed in 1997 and continued in 1998 and 1999 with funds provided by oil and gas consortia, including several U.S.-based companies, involved in developing the Sakhalin Island petroleum reserves. During 1999 two projects were undertaken, the first involving aerial surveys, shore-based observations, and acoustic studies, and the second involving a

continuation of photo-identification studies. To date, these studies have provided important new information on the status of the western North Pacific gray whale stock and the threats to its survival. They have confirmed at least a low level of reproduction, with annual sightings of up to seven calves. Through photographs they also have identified 88 individuals.

To assess the status of the western North Pacific gray whale stock, the threats to its survival, and priority research needs, the National Marine Fisheries Service convened a workshop on 27-28 February 1999 in La Jolla, California. The workshop, involving an international group of cetacean experts, reviewed the results of past studies on western North Pacific gray whales as well as pending research plans. Based on the review, the participants concluded that the population may number fewer than 50 mature individuals. In this regard, it was noted that the stock currently is listed as endangered by the International Union for the Conservation of Nature (IUCN) but that the IUCN also has a category for "critically endangered" species (*i.e.*, species that face an extremely high risk of extinction in the wild in the immediate future). The participants therefore recommended that the western North Pacific gray whale's status on the IUCN list be upgraded to critically endangered. This would make the western North Pacific gray whale stock the first whale stock to be so listed.

The participants also outlined a 10-year research and monitoring plan for western North Pacific gray whales and urged immediate and long-term funding for six essential research activities. These included (1) shore-based behavioral observations conducted at Sakhalin Island in conjunction with studies of underwater acoustics to correlate whale behavior with noise from industrial sources, (2) studies to monitor underwater sound levels within the hearing range of gray whales and attenuation of those sounds at various distances from industrial sources, (3) assessments of the density of benthic invertebrate prey communities within gray whale foraging areas, (4) vessel-based photo-identification studies, (5) the collection of biopsy samples for studies of stock genetics, population structure, and contaminant levels, and (6) conventional and satellite tracking studies to investigate habitat-use patterns and movements relative to industrial activity and during the fall migration.

Cook Inlet Beluga Whale (*Delphinapterus leucas*)

Beluga whales are found in seasonally ice-covered waters throughout Arctic and sub-Arctic regions. With the exception of those in the northern Gulf of Alaska, most beluga whales occupying U.S. waters are thought to winter in the Bering Sea in open leads and polynyas in the pack ice. In spring and summer, they occur in warmer coastal areas as well as offshore in pack ice. For management purposes, five stocks are recognized in U.S. waters. The distinction is based on the stocks' discontinuous summer distribution and on mitochondrial DNA analyses that indicate clear genetic differences among animals using different summering areas. The five stocks are located in Cook Inlet, Bristol Bay, the eastern Bering Sea, the eastern Chukchi Sea, and the Beaufort Sea.

The most isolated population of beluga whales in U.S. waters is found in Cook Inlet and is separated from the other four summer populations by the Alaska Peninsula. Because of their proximity to Anchorage, beluga whales in Cook Inlet are exposed to the largest urban coastal area in Alaska. A recent National Marine Fisheries Service analysis of beluga whale sightings in Cook Inlet over the past 30 years indicates that the stock's summer range has contracted in recent years and that, when compared with sightings in the 1970s and 1980s, animals now are rarely seen in offshore waters or the lower reaches of the inlet. During midsummer, the stock is concentrated in a few groups in the upper reaches of the inlet around river mouths. Their distribution becomes more dispersed as winter approaches.

Aerial surveys of beluga whales in Cook Inlet have been conducted by the National Marine Fisheries Service annually in June or July since 1994. Recent reanalyses of survey data from 1994 through 1998 incorporating video analysis of surfacing behavior indicate a decline in the Cook Inlet beluga whale population from an estimated 653 (CV=0.43) individuals in 1994 to 347 (CV=0.29) in 1998, or about a 47 percent reduction in numbers. Although final population estimates from the 1999 surveys were not available at the end of 1999, preliminary analyses suggested that the population had not declined further.

Under the Marine Mammal Protection Act, the National Marine Fisheries Service is required to prepare a stock assessment for each marine mammal stock under its jurisdiction that occurs in U.S. waters. Among other things, each stock assessment is to include an estimate of the potential biological removal level. This calculation is based on the stock's estimated minimum population size and maximum net productivity rate and a recovery factor ranging from 0.1 to 1.0, depending on the status of the stock. The potential biological removal is the maximum number of animals, not including natural mortalities, that may be removed from the stock while providing reasonable assurance that it will recover to or remain within its optimum sustainable population level. The potential biological removal level calculated for the Cook Inlet population of beluga whales in the 1998 stock assessment was 14 animals, using a recovery factor of 1.0.

The Alaska Regional Scientific Review Group, appointed by the Service to provide advice on the status of Alaska marine mammal stocks, met 18-20 November 1998 to evaluate information on the Cook Inlet beluga whale stock. The group recommended that the Service use the 1998 population size point estimate of 347 animals and, to reflect the depleted status of the stock, a recovery factor of 0.5 when calculating the potential biological removal level for the 1999 Cook Inlet beluga whale stock assessment. The group met again on 15-16 April 1999 to further evaluate available Cook Inlet beluga whale population data and concluded that it should be considered a "high risk" stock because of its low abundance, declining trend, limited range, and susceptibility to catastrophic events. As a result, the Alaska Regional Scientific Review Group recommended that the National Marine Fisheries Service use a recovery factor of 0.1 when calculating the potential biological removal level for Cook Inlet beluga whales. The final stock assessment report for Cook Inlet beluga whales, completed at the end of 1999, used a recovery factor of 0.5 and calculated a revised potential biological removal level of 2.7 whales per year.

Native Subsistence Harvest

Section 101(b) of the Marine Mammal Protection Act allows Alaska Natives to take marine mammals for subsistence or handicraft purposes provided the

taking is not done in a wasteful manner. The estimated subsistence harvest of Cook Inlet beluga whales averaged about 15 animals per year between 1990 and 1994 based on figures from a variety of sources provided by the Alaska Beluga Whale Committee, a group made up of Alaska Native beluga hunters and biologists. However, this figure almost certainly underestimates the take because it does not take into account all animals that were struck and lost and may not include beluga whales taken from the Cook Inlet stock by Native hunters who reside outside the Cook Inlet region. The Cook Inlet Marine Mammal Council, a Native group formed in 1992, estimates that more than 30 whales were taken annually by subsistence hunters in Cook Inlet from 1990 through 1994.

The most thorough surveys of beluga whale subsistence harvests in Cook Inlet were undertaken in 1995 and 1996 by the Cook Inlet Marine Mammal Council. The Council reported that 72 whales were taken in 1995, including 22 that were struck and lost. The kill in 1996 was estimated to be 123 whales, including an estimated 49 to 98 whales struck and lost. In 1997, 70 whales were estimated to have been taken, of which an estimated 35 were struck and lost. The 1998 estimated harvest of 78 beluga whales includes those struck and lost, as well as an unverified report of 20 whales taken during one weekend in June by hunters from outside the Cook Inlet region. As discussed below, no beluga whales were reported taken during the 1999 hunting season.

Management Issues

Beluga whale muktuk has been sold through commercial outlets in Anchorage under the provision of section 101(b) of the Marine Mammal Protection Act that allows edible portions of marine mammals taken by Alaska Natives to be sold in Native villages and towns. Under the current interpretation of the Marine Mammal Protection Act, Anchorage is included as a Native village. Muktuk is the skin and blubber from the whale and is a prized Native food. Because of the demand for muktuk, beluga whales taken near Anchorage have a significant cash value. Before 1999 some hunters reportedly took large numbers of beluga whales for the muktuk, which they sold privately or at Native stores in Anchorage.

Prior to the 1999 beluga whale hunting season, there had been no effective mechanism for establishing limits on the Native subsistence take from the Cook Inlet stock. The National Marine Fisheries Service has been working with Alaska Natives, particularly the Cook Inlet Marine Mammal Council, to develop a co-management agreement under section 119 of the Marine Mammal Protection Act. Among other things, the purpose of the agreement is to establish mutually acceptable harvest limits for the Cook Inlet stock. However, a number of contributing factors has made setting such harvest limits particularly difficult. Cook Inlet is a large area that includes many communities. The Alaska Native population that hunts whales from this stock includes individuals from local villages as well as people who move into the region from elsewhere in Alaska. Beluga whale hunters who have moved into the area from elsewhere may not be members of local tribes and consequently may not be members of the Cook Inlet Marine Mammal Council or other tribally authorized groups. Cook Inlet beluga whales also may be hunted legally by Alaska Natives living in other parts of the state.

Ultimately, the greatest impediment to effective co-management lies in the inability to enforce the provisions of an agreement. Although amendments to the Marine Mammal Protection Act enacted in 1994 provide explicitly for co-management agreements, they do not, as currently interpreted by the National Marine Fisheries Service, convey additional authority to the Service or Native organizations to enforce such agreements. Thus, despite agreement by the Service, the Alaska Beluga Whale Committee, and the Cook Inlet Marine Mammal Council that the commercial sale of beluga whales should be prohibited and hunting curtailed, by the end of 1998 it was apparent that additional measures were needed. Designating the stock as depleted under the Marine Mammal Protection Act or listing it as threatened or endangered under the Endangered Species Act would enable the Service to regulate the harvest, provided that certain findings were made.

Status Review

Concern over the small and decreasing number of beluga whales in Cook Inlet and the apparent overharvesting prompted the Service to publish in the 19

November 1998 *Federal Register* a notice of intent to review the status of Cook Inlet beluga whales. The purpose of the review was to determine whether the Cook Inlet stock should be designated as depleted under the Marine Mammal Protection Act or listed as endangered under the Endangered Species Act; it was also to consider the stock's distribution, abundance, population dynamics, food habits, and health, as well as the effects of the Native subsistence harvest on the population and the potential effects of other anthropogenic impacts.

In response to the notice, the Commission, by letter of 22 January 1999, provided comments to the Service. The Commission noted that the unsustainable harvest by Alaska Natives was a major factor in the decline of the population and further noted that the preferred approach for addressing the problem of overharvest should be a cooperative one in which the Native community and the Service share responsibility for conserving the Cook Inlet beluga whale population. The Commission nevertheless recommended that the Service take immediate action to list the Cook Inlet stock of beluga whales as endangered or threatened under the emergency listing provision of the Endangered Species Act. Inasmuch as such a listing would be effective for only 240 days, the Commission also recommended that the Service promptly publish a proposed rule to list the stock under normal procedures and take steps to comply with the other procedural requirements.

The prohibitions on taking that apply to endangered or threatened species by virtue of listing cannot, by themselves, limit harvest levels as long as the whales are taken by Alaska Natives for subsistence purposes and the taking is not accomplished in a wasteful manner. Therefore, the Commission further recommended that the Service initiate a rulemaking under section 10(e) of the Endangered Species Act and/or section 101(b) of the Marine Mammal Protection Act to limit the allowable Native take from the Cook Inlet beluga whale population. Acknowledging that there may be impediments preventing the Service from quickly establishing regulatory limits on the Native harvest of Cook Inlet beluga whales, the Commission noted that, as an alternative, the Service should pursue a legislative solution to provide the necessary level of protection to this stock in a timely fashion. That is,

it should pursue a narrowly drafted amendment that addressed only the Cook Inlet stock of beluga whales and that could be passed in time to prevent or limit the harvest during the 1999 season.

This latter approach ultimately was followed with enactment on 21 May 1999 of the Stevens Amendment as section 3022 of Public Law 106-31, the 1999 Emergency Supplemental Appropriations Act. The provision is a free-standing amendment specifying that, until 1 October 2000, the taking of a beluga whale from the Cook Inlet stock will be lawful only if it occurs pursuant to a cooperative agreement between the Service and Alaska Native organizations. Although this amendment has increased the urgency for concluding a co-management agreement, it is unclear what will happen after the provision lapses in October 2000 if harvest regulations and an effective co-management agreement are not in place.

Proposed Rule for Depleted Status

As part of the Cook Inlet beluga whale status review, the National Marine Fisheries Service held a workshop on 8-9 March 1999 to review recent information and analyses on the stock. The review confirmed that the Cook Inlet beluga whales are geographically and genetically isolated from other beluga whale stocks; that the stock's abundance declined by nearly 50 percent between 1994 and 1998; that the current abundance, based on the Service's June 1998 assessment, is estimated to be 347 whales; and that the potential biological removal level established for this stock should be no more than three whales. The Service provided a draft report based on results of the scientific review to the Commission early in July 1999, seeking the Commission's concurrence that designation of the stock as depleted under the Marine Mammal Protection Act was warranted. In its 23 July 1999 response, the Commission recommended that the Service promptly complete and publish a proposed rule under section 115(a) of the Marine Mammal Protection Act to designate the Cook Inlet beluga whale population as depleted or, alternatively, publish a proposed rule to list the population as threatened or endangered under the Endangered Species Act. On 19 October 1999 the Service published a proposed rule in the *Federal Register* to designate the Cook Inlet beluga whale stock as depleted.

On 21 December 1999 the Commission provided comments on the proposed rule and, more generally, on discussions about the Cook Inlet beluga whale stock that had taken place at the Commission's annual meeting on 19-21 October 1999. Although the threat of overharvesting by Alaska Natives for subsistence and related commercial purposes has been abated in the short term by the statutory amendment, there is no adequate mechanism in place to govern the Cook Inlet beluga whale harvest after 1 October 2000 when the amendment ceases to be in effect.

In its letter of 22 December 1999 the Commission identified three approaches available to the Service to ensure that beluga whale harvests in Cook Inlet do not exceed sustainable levels after the amendment lapses: (1) concluding a cooperative management agreement or series of agreements with all Native hunting groups that will ensure that sustainable harvest levels are not exceeded; (2) promulgating regulations under section 101(b) of the Marine Mammal Protection Act to impose limits on the numbers of Cook Inlet beluga whales that can be taken for subsistence purposes; and (3) securing a long-term legislative solution to prevent overharvesting and allow the stock to recover to its optimum sustainable population level. The Commission suggested that the Service pursue all three alternatives. In addition, the Commission recommended that the Service (1) publish a final depletion finding as quickly as possible; (2) give high priority to ensuring that an adequate mechanism is in place by 1 October 2000 to govern the harvest; (3) apprise Congress of the current situation regarding Cook Inlet beluga whales, actions being taken by the Service and others to address the situation, and the possible need for additional remedial legislation; and (4) publish a proposed rule to list the Cook Inlet beluga whale stock as either endangered or threatened under the Endangered Species Act.

Marking and Tagging Program

The actions being taken by the National Marine Fisheries Service to work with Alaska Native organizations to conserve and manage marine mammal species for which the Service is responsible are encouraging. However, in some cases the Service lacks information on the level of subsistence take from various marine mammal stocks. To rectify this

situation with respect to Cook Inlet beluga whales, the Commission in its 22 January 1999 letter to the Service recommended that it institute a marking and tagging program, as previously suggested to the Service by the Alaska Regional Scientific Review Group, to obtain reliable information on the subsistence take from this stock. The Service agreed and on 24 May 1999 published an interim rule in the *Federal Register* requiring the marking and reporting of beluga whales harvested in Cook Inlet by Alaska Natives. On 1 October 1999 the Service published the final rule, unchanged from the interim rule, requiring the marking and reporting of all Cook Inlet beluga whales taken by Alaska Natives.

Environmental Impact Statement

On 30 November 1999 the National Marine Fisheries Service published a *Federal Register* notice of intent to prepare a programmatic environmental impact statement on federal activities needed to halt the decline and promote recovery of Cook Inlet beluga whales. The statement will include, but will not be limited to, consideration of the environmental consequences of possible alternatives to management of the Native subsistence take in Cook Inlet.

Gulf of Maine/Bay of Fundy Harbor Porpoise (*Phocoena phocoena*)

Harbor porpoises, one of the smallest of all cetaceans, grow to lengths of only about 2 m (6.5 ft). They occur in relatively discrete regional stocks found only in the Northern Hemisphere in cold-temperate waters over the continental shelf. Because they feed on small schooling fish, such as herring and silver hake, that are caught by gillnetters or eaten by other fish caught by gillnetters, harbor porpoises often encounter and become caught in gillnets. In many areas, so many harbor porpoises are caught in gillnets that local stocks have been substantially reduced in size. The Gulf of Maine/Bay of Fundy harbor porpoise (hereafter referred to as the Gulf of Maine harbor porpoise), whose range extends from the northern Bay of Fundy, Canada, to Cape Hatteras,

North Carolina, is among the stocks that have sustained high levels of incidental take.

During summer Gulf of Maine harbor porpoises concentrate at the northern end of their range in the Gulf of Maine and the Bay of Fundy. To estimate their abundance, the National Marine Fisheries Service conducted population surveys in the summers of 1991, 1992, and 1995. The surveys produced population estimates with such wide, overlapping confidence limits that they were unable to provide reliable information on population trends. However, by pooling and weighting results of the three surveys, Service scientists have developed a best estimate of stock size. This was calculated to be 54,000 porpoises (95 percent confidence interval 41,300-71,400). Using this estimate in a formula designed to calculate potential biological removal levels for marine mammal stocks (*i.e.*, the number of animals that can be removed from a stock, not including natural mortality, and still have assurance that it would increase toward or remain at its optimum sustainable population level), the Service calculated a potential biological removal level of 483 porpoises per year for the Gulf of Maine harbor porpoise stock. As discussed below, the Service also conducted a survey in 1999, but the results were not available as of the end of the year.

Gulf of Maine harbor porpoises are caught incidentally in gillnets set for groundfish (cod, flounder, and haddock), dogfish, and monkfish in both U.S. and Canadian waters. The first of these gillnet fisheries targeted groundfish in Canada in the 1960s and spread to U.S. waters in the Gulf of Maine in the 1970s. In the 1980s, the gillnet fisheries continued to expand both in terms of the species sought and the areas fished. Although there were no systematic, region-wide estimates of harbor porpoise bycatch during these periods, by the late 1980s information from studies of harbor porpoise biology and bycatch in some areas suggested that the effects of bycatch on the regional harbor porpoise stocks could be substantial.

To more fully evaluate bycatch effects the National Marine Fisheries Service and Canada's Department of Fisheries and Oceans began gillnet fishery observer programs in the late 1980s and early 1990s. Their purpose was to determine and monitor the rates at which harbor porpoises were being caught in various

fishing areas within their respective jurisdictions. With information on bycatch rates from a sample of fishing trips in the various areas and reported fish landings used as a measure of total fishing effort, annual bycatch estimates have been extrapolated. In the early 1990s, dead harbor porpoises began washing ashore with net marks along U.S. mid-Atlantic states in spring months. Given this evidence that fisheries developing south of New England also were catching Gulf of Maine harbor porpoises, the Service took steps to monitor gillnet fisheries in that area as well.

As shown in Table 3, monitoring results for both the New England and Bay of Fundy fishing areas indicate that bycatch levels have declined substantially in recent years. The declines have been most evident since the first bycatch reduction measures were implemented. For New England waters, the first bycatch reduction measures were implemented by the National Marine Fisheries Service in 1994, and for the Bay of Fundy they were implemented by the Canadian Department of Fisheries and Oceans in 1993. However, in both areas, particularly in Canada, other fishery management actions aimed at reducing and redistributing fishing effort to protect severely overfished groundfish stocks may have been particularly important factors in bringing about the decline in bycatch.

Although bycatch levels have declined in the northern end of the stock's range, they increased in the mid-Atlantic area between 1995 and 1998. This may reflect the combined effects of increased fishing and better observer coverage. No bycatch reduction measures were in effect for that area until 1999.

Although initial bycatch estimates were incomplete (*e.g.*, estimates for Canadian waters did not become available until 1993), the early estimates along with biological information suggested that the total bycatch was exceeding sustainable levels. The initial estimates also confirmed that the harbor porpoise incidental take in U.S. gillnet fisheries was the largest fishery-related bycatch of any cetacean stock in U.S. waters. With no management measures in place to limit bycatch levels, various environmental groups and the Marine Mammal Commission wrote to the Service in 1990 expressing concern about the effects of bycatch on harbor porpoises and the need for management action.

Table 3. Estimates of harbor porpoise bycatch in sink gillnet fisheries in the Bay of Fundy (Canada), Gulf of Maine (U.S.), and off the U.S. mid-Atlantic states, 1990-1998¹

Year	New England ²		Bay of Fundy ³	U.S. Mid-Atlantic ⁴		Total
1990	2,900	(1,500-5,500)	-	-	-	-
1991	2,000	(1,000-3,800)	-	-	-	-
1992	1,200	(800-1,700)	-	-	-	-
1993	1,400	(1,000-2,000)	424	(200-648)	-	-
1994	2,100	(1,400-2,900)	101	(80-122)	-	-
1995	1,400	(900-2,500)	87	103	(11-254)	1,590
1996	1,200	(800-1,800)	20	310	(162-567)	1,530
1997	782	(501-1,208)	43	572	(296-1,071)	1,397
1998	332	(170-728)	10	446	(294-894)	788

¹ Numbers in parentheses are ranges of the 95 percent confidence interval where available.

² Palka, D. 1997. Gulf of Maine Harbor Porpoise By-catch. Prepared for the Gulf of Maine Harbor Porpoise Take Reduction Team Meeting, December 16-17, 1997. National Marine Fisheries Service, Woods Hole, Massachusetts. Estimates for 1997 and 1998 are from unpublished National Marine Fisheries Service data.

³ Trippel, E.A. 1998. Harbour Porpoise By-Catch in the Lower Bay of Fundy Gillnet Fishery. DFO Maritime Regional Fisheries Status Report 98/7E. Canadian Department of Fisheries and Oceans, Dartmouth, Nova Scotia.

⁴ Palka, D. 1997. Mid-Atlantic Harbor Porpoise By-catch and Gear Characteristics. Prepared for the Gulf of Maine Harbor Porpoise Take Reduction Team Meeting, 16-17 December 1997. National Marine Fisheries Service, Woods Hole, Massachusetts. Estimates for 1997 and 1998 are from unpublished National Marine Fisheries Service data.

In response, the Service increased efforts to document the nature and extent of management actions to provide a basis for management decisions. In September 1991 the Sierra Club Legal Defense Fund, on behalf of 13 environmental organizations, petitioned the National Marine Fisheries Service to list the Gulf of Maine harbor porpoise as threatened under the Endangered Species Act. The Service found merit in the petitioned action, and on 7 January 1993 it published a proposed rule in the *Federal Register* to list the stock as threatened. Commission comments in support of the proposed rule are discussed in previous annual reports. Subsequently, however, the Service deferred action on the proposal while it attempted to implement measures to reduce bycatch. Progress in this regard has been slow, proceeding at a varying pace in each region.

In 1994 the Marine Mammal Protection Act was amended to set forth a new approach for governing the incidental take of marine mammals in commercial fisheries. In part, the amendments require the Service

to convene take reduction teams when incidental take levels exceed the calculated potential biological removal level for a marine mammal stock. These teams, composed of representatives of involved fisheries, environmental groups, the scientific community, and government agencies, are charged with recommending take reduction plans that, when implemented, would reduce bycatch of the stock in question to below its potential biological removal level within six months.

To address the bycatch of Gulf of Maine harbor porpoises in U.S. waters, the Service established two take reduction teams. One was established in February 1996 to develop a recommended plan for sink gillnet fisheries in New England and the other, formed in February 1997, focused on gillnet fisheries between New York and North Carolina.

For the New England area, take reduction measures have focused on the use of acoustic deterrents called pingers, intended to keep harbor porpoises

away from nets, and the application of two types of time-area management zones — one in which fishing is prohibited altogether and the other in which fishing is permitted only if nets are equipped with pingers. Pingers are soda can-sized devices that emit sound pulses within a specified frequency or frequencies at set time intervals. Controlled experiments off New England in 1994 and 1997 revealed that gillnets with working pingers spaced evenly along nets caught as much as 90 percent fewer harbor porpoises than nets equipped with non-functioning pingers placed on nets as experimental controls. As discussed in past annual reports, the Commission provided the Service and the New England Fisheries Management Council a critique of the experiment. It concluded that pingers show great promise as a mitigation measure, but that further studies were needed to resolve uncertainties, such as whether harbor porpoises would habituate to pinger sound and whether pingers would be as effective in other seasons and areas.

The first bycatch reduction measures in New England were implemented in 1994 based on recommendations developed by the New England Fishery Management Council before the Gulf of Maine Take Reduction Team was established. The measures, on which the Commission provided extensive comments, included seasonal closures in high bycatch areas where no fishing was allowed and provisions to allow experimental fishing with pinger-equipped nets in some of the closed areas. The initial closures were too small and too brief to achieve significant bycatch reductions. Since then, bycatch reduction efforts for this area have sought to (1) increase the times and areas covered by management zones, and (2) further assess the effectiveness of pingers. Although the 1994 amendments to the Marine Mammal Protection Act directed the Service to implement a take reduction plan for Gulf of Maine harbor porpoises by April 1997, final rules for the take reduction plan were not adopted until December 1998. In large part, this was because of delays of more than a year in developing annual bycatch estimates needed to evaluate the effectiveness of previously adopted measures. Uncertainty and frequent changes with regard to fishing closures recommended by the fishery management council to protect severely depleted groundfish stocks also slowed Service action on adopting a plan.

As discussed in the previous annual report, the December 1998 plan established a complex and extensive network of time-area management zones for New England waters that overlaid other gillnet fishing closures adopted to protect severely depleted groundfish stocks. Although fishing closures adopted to protect fish stocks were not designed to reduce harbor porpoise bycatch, some of those closures overlapped times and areas where harbor porpoises have been taken, but were not included in time-area management zones established to protect harbor porpoises. The Service therefore considered the effect of both sets of management provisions in projecting the extent to which harbor porpoise bycatch off New England would be reduced.

A different approach has been developed to reduce harbor porpoise bycatch off U.S. mid-Atlantic states. Mid-Atlantic gillnet fisheries include gillnetters from both mid-Atlantic and New England states, and initial observer data for this region suggested that New England gillnetters caught harbor porpoises at higher rates than gillnetters from mid-Atlantic states. The differences were thought to be due to regional differences in gear characteristics, such as twine diameter, mesh size, tie-downs (*i.e.*, lines connecting the float line and lead line to limit the vertical height of a net), and the number and length of nets set. Therefore, to reduce harbor porpoise bycatch in the mid-Atlantic region, the mid-Atlantic take reduction team recommended a combination of area closures and gear specifications. These bycatch reduction measures, included by the Service in its take reduction plan implemented in December 1998, were the first for the mid-Atlantic region. The mid-Atlantic team considered but did not reach consensus on, exploring the use of pingers. Some members of the team believed that if gear specifications could be identified to limit bycatch, as the initial observer data suggested, they would be cheaper, easier to use, more reliable, and avoid possible impacts associated with the introduction of noise into the ocean.

The Marine Mammal Commission has commented extensively to the National Marine Fisheries Service and other involved parties on actions needed to reduce the bycatch of Gulf of Maine harbor porpoises. Among other things, a Commission representative has participated on the Gulf of Maine Harbor Porpoise

Take Reduction Team and the Commission has provided comments and recommendations on proposed research and management plans to reduce bycatch. Past efforts in this regard are discussed in previous annual reports. Developments during 1999 are discussed below.

Harbor Porpoise Review

During its 10-12 November 1998 annual meeting, the Marine Mammal Commission conducted a detailed review of actions to reduce the bycatch of Gulf of Maine harbor porpoises, including the National Marine Fisheries Service's proposed take reduction plan. Based on its review, the Commission wrote to the Service on 8 December 1998 providing comments and recommendations. The Service responded to the Commission's letter on 4 March 1999.

In its 8 December 1998 letter, the Commission noted that the Service was clearly making progress in several important areas. However, it also noted that certain concerns expressed in an earlier letter to the Service on 15 October 1998 commenting on the proposed take reduction plan had not been adequately addressed. It noted that assumptions used by the Service to predict needed take reduction measures appeared to underestimate bycatch levels in the mid-Atlantic region (the Service's plan assumed bycatch levels would be 207 porpoises per year for that region) and to overestimate the effectiveness of initial pinger use in commercial fishing operations (the Service's plan assumed an 80 percent reduction in bycatch rates in all areas where pingers would be required). Accordingly, the Commission concluded that stronger measures appeared necessary to reduce bycatch below the stock's calculated potential biological removal level. In this regard, it referenced its previous recommendations for additional fishing closures and a requirement for the use of pingers in all New England waters where harbor porpoises are likely to occur.

With regard to these points, the Service's 4 March reply noted that, although recent bycatch estimates for the mid-Atlantic region were higher than those assumed in its plan, the plan would still achieve the required take reduction goal because the Service expected the proposed management measures for the

mid-Atlantic region to reduce bycatch by more than the 75 percent reduction level used in the plan to predict bycatch levels. The Service also noted that, although the use of pingers in commercial fishing operations to date had not achieved bycatch reduction levels comparable to those attained in scientifically controlled experiments, it felt that regionwide use of pingers, as recommended by the Commission, would be inappropriate given untested technical aspects associated with pingers. The Service therefore took no action to strengthen bycatch reduction measures beyond those in its initial plan.

With regard to pinger technology, the Commission's 8 December 1998 letter noted that, although sounds produced by pingers appeared to be effective in reducing harbor porpoise bycatch, they involved sound sweeps across a range of frequencies and it was not known whether porpoises were responding to particular frequencies, frequency variations, or harmonics. The Commission also noted that the behavior of seals or other marine mammals could be affected by pingers. For example, seals might learn to associate pinger sounds with the availability of fish caught in nets, and pingers could therefore become attractants for seals and cause increased seal predation on fish in nets. Because the hearing range of seals, as well as that of some other cetaceans, differs from that of harbor porpoises, the Commission recommended that further research be undertaken to define the specific sound characteristics that serve to repel porpoises from nets. Results of those studies could be used to narrow the frequency ranges of pingers to help avoid possible effects on other marine mammals. The Commission also recommended that studies be undertaken to determine whether sound frequencies and bycatch rates change as the battery power of pingers declines, and that the Service consult with fishermen and scientists who had used pingers to determine how pinger designs might be made more reliable and easier to use.

The Service's 4 March reply noted that it agreed that further research was needed to refine appropriate pinger frequencies, but did not indicate what studies would be done in this regard. Funding for such research apparently was not available and, as of the end of 1999, further work to define the sound characteristics that make pingers effective had not been

undertaken. The Service's reply also noted that a study was under way to evaluate the effectiveness of pingers by randomly retrieving commercially used pingers to assess how the devices are affected under normal use. If further experience with pingers demonstrates their effectiveness, the Service noted that it would then be appropriate to investigate ways of designing pingers that are easier to maintain, more reliable, and focused on deterring the target animals. In this regard, the Service noted that it had to evaluate the effectiveness of its take reduction plan within the first six months of implementation (*i.e.*, mid-1999).

Proposal to List Gulf of Maine Harbor Porpoise as Threatened

As noted above, the National Marine Fisheries Service proposed listing the Gulf of Maine harbor porpoise as threatened under the Endangered Species Act in January 1993. The action responded to a September 1991 petition by the Sierra Club Legal Defense Fund and other environmental organizations. Among the reasons cited for the proposed listing was the lack of management measures to reduce harbor porpoise bycatch. Because steps were taken to develop bycatch reduction measures, the Service deferred action on its proposal. The measures imposed initially had little effect on overall bycatch levels and, as discussed in the previous annual report, given the slow pace of developing effective measures consistent with statutory deadlines, a lawsuit was filed against the National Marine Fisheries Service on 21 August 1998 by the Center for Marine Conservation, the Humane Society of the United States, and the International Wildlife Coalition. In part, the suit cited violations of the Endangered Species Act, which require action on listing petitions within a specified period of time.

In response to this point and as part of a settlement agreement reached late in 1998 (see the previous annual report), the Service reopened the comment period on the proposed listing action on 22 October 1998. The Marine Mammal Commission provided comments to the Service on this matter in its 8 December 1998 letter noted above. Given that harbor porpoise bycatch levels under the various measures implemented by the Service since 1994 had remained

several times higher than the stock's calculated potential biological removal level, and considering that it was not clear how successful the Service's proposed take reduction plan would be, the Commission recommended that the Service announce plans to proceed with the proposed listing if the plan failed to achieve the required goal of reducing bycatch to below the potential biological removal level within six months. The Commission also recommended various actions to monitor and improve information on the stock's abundance and trends.

On 5 January 1999 the Service published a *Federal Register* notice announcing its conclusion that the listing action was not warranted at that time, given its expectation that new bycatch reduction measures implemented as part of its Gulf of Maine Harbor Porpoise Take Reduction Plan would reduce bycatch levels to below the stock's calculated potential biological removal level within six months. Accordingly, the Service withdrew its proposal to list the Gulf of Maine harbor porpoise as threatened, but retained the stock on its list of candidate species for future listing. The Service also noted that it would continue to monitor bycatch levels and, if necessary, develop further restrictions to reduce bycatch to required levels. In this regard, the Service noted that it would reconvene the take reduction teams semi-annually during the first year of the plan to help track progress toward achieving the six-month goal of reducing bycatch below the potential biological removal level.

Monitoring the Effectiveness of the Gulf of Maine Harbor Porpoise Take Reduction Plan

As noted above and in previous annual reports, the development of effective harbor porpoise take reduction measures has proceeded slowly. In part this is because annual estimates of harbor porpoise bycatch have lagged more than a year behind the close of gillnet fishing seasons. As a result, it has not been possible to identify deficiencies in adopted measures and to implement new measures before the next fishing season begins. To address this problem and as part of the settlement agreement to resolve the above-noted lawsuit filed by environmental groups in August 1998, the National Marine Fisheries Service commit-

ted to developing harbor porpoise bycatch estimates for the first four months of 1999 by August 1999 and thereafter to make bycatch estimates public on a quarterly basis at least through the end of 2001.

On 30 August 1999 the Service announced a bycatch estimate for the first four months of 1999 of 104 animals for the Gulf of Maine and 53 animals for the mid-Atlantic region. Between April and the end of August, no takes were observed in the mid-Atlantic area and an estimated 70 porpoises were taken in New England. Thus, the estimated total take in U.S. waters for the first eight months of 1999 was 227 harbor porpoises (174 porpoises off New England and 53 porpoises off mid-Atlantic coastal states). Bycatch estimates for the final four months of 1999 were not available as of the end of 1999; however, assuming bycatch rates in Canada remained in the low tens of animals, it appeared that the bycatch levels for 1999 would be reduced to a number close to the stock's potential biological removal level.

To help assess the status of the Gulf of Maine harbor porpoise stock, the Service also carried out another harbor porpoise survey during the summer of 1999. The survey, which was the first conducted since 1995, used methodology consistent with the previous surveys and is expected to provide a new estimate of the size of the Gulf of Maine harbor porpoise stock. Unusually warm water temperatures in the Gulf of Maine and the Bay of Fundy during the summer months resulted in a distribution of harbor porpoises that differed from that found in previous surveys. Although the survey data had not been fully analyzed as of the end of 1999, preliminary examinations indicate that the new population estimate, expected to be available early in 2000, would not differ substantially from the previous estimate of 54,000 porpoises derived from the 1991, 1992, and 1995 surveys.

As noted above, in announcing its decision to withdraw the proposal for listing the Gulf of Maine harbor porpoise as threatened under the Endangered Species Act, the Service noted its intent to reconvene its harbor porpoise take reduction teams semi-annually to review progress and determine any further actions needed to reduce bycatch levels. The Service considered holding a joint meeting of both the Gulf of

Maine and Mid-Atlantic take reduction teams late in 1999, but due to scheduling conflicts, it was unable to do so. As a result, it convened the Gulf of Maine take reduction team on 14-15 December 1999 and scheduled a meeting of the mid-Atlantic team for 13-14 January 2000.

During its meeting, the Gulf of Maine team reviewed new information, including the above-noted information on 1999 bycatch levels and the preliminary results from 1999 harbor porpoise survey. Among other things, the team was advised that the New England Fishery Management Council was considering actions to modify its system of fishing closures to protect severely depleted groundfish stocks off New England. Among the changes being considered was the elimination of a year-round closure implemented in 1998. The area, off southern Maine, New Hampshire, and northern Massachusetts, had experienced high bycatch rates prior to 1998.

As noted above, closures adopted to conserve fish stocks may have contributed substantially to the reduction of porpoise bycatch rates. Information to evaluate the extent to which those fishery closures reduced bycatch in 1999, however, was not yet available at the time of the team's meeting. Given the uncertainty as to closure modifications that the council might recommend and a lack of data to evaluate how current or prospective closures could affect porpoise bycatch levels, the team was unable to recommend changes that might be needed to reduce harbor porpoise bycatch under the Service's harbor porpoise take reduction plan.

The team also was advised that seal bycatch rates appeared to be higher in nets equipped with pingers. This suggests that pinger sounds are being used by seals to locate nets where they can feed on the caught fish. Recent studies on the effectiveness of pingers elsewhere have suggested that sound frequencies above the hearing threshold of seals are just as effective in deterring harbor porpoises as lower frequencies. The team therefore recommended that the Service authorize experimental fishing with new pingers that emit only higher-frequency sounds (*e.g.*, 45 kHz or higher) within the hearing range of porpoises but above the hearing range of seals. To collect data for assessing their effectiveness in reduc-

ing both seal and harbor porpoise bycatch, the team recommended that the Service make a special effort to place observers aboard vessels using the new pingers.

To ensure that nets in areas requiring the use of pingers are equipped with properly functioning pingers, the Service's take reduction plan included two key provisions: (1) the deployment of hydrophones on enforcement vessels to check whether set nets had functioning pingers and (2) a study to randomly retrieve a sample of deployed pingers from fishermen in exchange for new pingers to check their sound characteristics. During its meeting, the team was advised that the Service was unable to carry out these tasks. The Coast Guard was unwilling to use hydrophones to check untended nets and the fishermen were unwilling to exchange their pingers for the pingers purchased by the Service because the latter lacked saltwater switches used by fishermen to activate the devices when put into the water. Given the need to ensure that pingers are properly deployed, the team suggested possible enforcement approaches and asked that the Service develop an enforcement plan in cooperation with the Coast Guard to ensure that pinger requirements are being met. The team also recommended that gillnet fishery observers test pingers on a random sample of nets to assess the proportion of pingers not functioning properly.

Litigation

As noted above, the Center for Marine Conservation, the Humane Society of the United States, and the International Wildlife Coalition filed suit in U.S. district court on 21 August 1998 seeking to compel the National Marine Fisheries Service to adopt additional protective measures for harbor porpoises (*Center for Marine Conservation v. Daley*). The plaintiffs alleged that the Service had violated the Endangered Species Act by failing to take final action on its proposed rule to list harbor porpoises as threatened within the prescribed time frame. They also claimed that the Service had violated the Marine Mammal Protection Act by failing to publish a take reduction plan by 1 April 1997 that would reduce the incidental mortality and serious injury of harbor porpoises to below the stock's potential biological removal level within six months.

Under a settlement agreement worked out by the parties and approved by the court on 8 November 1998, the National Marine Fisheries Service, among other things, committed to issuing a final take reduction plan for the Gulf of Maine harbor porpoise population by 1 December 1998 and to providing information on harbor porpoise incidental take levels on a quarterly basis through December 2001.

The plaintiffs in the case wrote to the Service on 16 November 1999 alleging that it had failed to comply fully with the terms of the settlement agreement because it had not provided information regarding take levels in a form that enabled the plaintiffs to assess the effectiveness of the take reduction plan. They requested that the quarterly reports of harbor porpoise mortality be structured to provide data in a comprehensive and uniform manner in order to allow for meaningful analysis. Specifically, the plaintiffs requested that the Service provide data by month or season for each management region in the Gulf of Maine and each sub-area within the mid-Atlantic and, for mid-Atlantic fisheries, summarize mortality data based on vessel home port. At the end of 1999 the Service had provided these data to the Gulf of Maine Harbor Porpoise Take Reduction Team and the plaintiffs had not sought judicial intervention to resolve the matter.

Bottlenose Dolphin (*Tursiops truncatus*)

The bottlenose dolphin is the cetacean species found most commonly along the U.S. southeastern and Gulf of Mexico coasts. It is the cetacean species most likely to be affected by environmental pollution, fisheries, oil and gas development, and other human activities in these areas. It also is the cetacean species maintained most frequently in captivity for purposes of public display and scientific research.

As noted in previous annual reports and in Chapter VI of this report, at least four unusual mortality events involving bottlenose dolphins have occurred since 1987 along the east and Gulf coasts of the United States. Available information is insufficient to determine whether the dolphins in these geographic

areas constitute discrete stocks and, if so, their boundaries, sizes, and productivity. Consequently, it has not been possible to determine the number of stocks that may have been affected by the unusual mortality events, the degree to which their size or productivity may have been affected, the time it would take for the stocks to recover to pre-event conditions, or the types and level of monitoring required to confirm when recovery has occurred. Further, available information is insufficient to accurately estimate the numbers, ages, and sex of bottlenose dolphins being killed incidentally in coastal fisheries or to determine how fishery-related mortality and disturbance associated with oil and gas development, recreational boating, and other activities may be affecting the size and productivity of dolphin stocks.

Because of these uncertainties, the Commission has repeatedly recommended that the National Marine Fisheries Service develop and implement a bottlenose dolphin conservation plan. During the Commission's November 1998 annual meeting in Portland, Maine, representatives of the Service described ongoing efforts to determine the discreteness, size, and productivity of bottlenose dolphin populations, and threats to those populations. They advised the Commission that the Service had contracted with three scientists familiar with bottlenose dolphins and related conservation issues to prepare a conservation plan for bottlenose dolphins in the northern Gulf of Mexico and along the east coast of the United States.

Based on that information, the Commission wrote to the Service on 18 December 1998 commending it for its reported efforts to develop a conservation plan. The letter noted that there appeared to be at least four reasonably discrete types of bottlenose dolphin populations in U.S. Gulf and Atlantic waters: (1) a near-shore east coast population that migrates annually between summering areas north of Cape Hatteras, North Carolina, and wintering areas off Georgia and northern Florida; (2) year-round resident populations in places such as Sarasota Bay; (3) populations that occur in deep waters off both the Atlantic and Gulf states; and (4) intermixing resident and migratory populations that overlap seasonally in places such as the Indian and Banana Rivers in east-central Florida. The Commission pointed out that long-term mark/resighting or radio-tagging programs were

required to determine the geographic distribution and discreteness of possible separate populations and that program development plans prepared by the Service's Southeast Fisheries Science Center in the late 1970s and early 1980s had called for establishing long-term mark/resighting programs in Sarasota Bay, Mississippi Sound, and the Indian and Banana Rivers.

The Commission also pointed out that, although pilot studies had been initiated in each of the referenced areas, only the one in the Sarasota area had been continued. The Commission reiterated a recommendation, made by participants in a program review held at the Southeast Fisheries Science Center in December 1996, that the Service identify and initiate long-term longitudinal studies in additional areas thought to be representative of the different types of bottlenose dolphin populations. The Commission also recommended that the Service consult with the Environmental Protection Agency, the Minerals Management Service, and relevant coastal state agencies to determine whether everything necessary was being done to assess the sources, levels, and effects of anthropogenic contaminants present in bottlenose dolphins in waters off the U.S. Atlantic and Gulf states. The Commission also noted that much potentially useful research was being done by volunteer organizations, students, and non-government researchers. Because of limited funding available to the Service, the Commission recommended that the conservation plan indicate how volunteers, students, and non-government researchers could be used to help meet the objectives of federal and state programs.

At the end of 1998 it was the Commission's understanding that a draft conservation plan would be completed and circulated for comment during the first half of 1999. At the end of 1999 the Commission was advised that the individuals who had been contracted to draft a conservation plan had done so and that the draft had been forwarded to the Southeast Fisheries Science Center for consideration. No indication was provided as to when the conservation plan would be finalized or forwarded to the Commission for its review and comment.

The Commission continues to believe that a conservation plan is needed to identify and focus efforts on minimizing threats to discrete stocks of

bottlenose dolphins off the coasts of Atlantic and Gulf states. Further, the Commission believes that the plan should identify the personnel, financial, and other resources needed to address the priority research and management issues most cost-effectively. The Commission will consult with the Service early in 2000 to determine why it has been unable to develop a conservation plan that meets these objectives.

Hawaiian Monk Seal *(Monachus schauinslandi)*

The Hawaiian monk seal is the most endangered seal in the United States and one of the world's most endangered pinnipeds. Along with Mediterranean monk seals, Galapagos fur seals, and Galapagos sea lions, Hawaiian monk seals are one of only four seal species found in the tropics. They breed only in the Hawaiian archipelago. With the exception of a few births over the past decade in the main Hawaiian Islands, all of the species' pups are born in the remote Northwestern Hawaiian Islands. This chain of small, largely uninhabited islets and atolls extends about 1,100 nmi (2,000 km) between Kauai and Niihau, the easternmost of the main Hawaiian Islands, and the Midway Islands and Kure Atoll (Fig. 2). Most of the Northwestern Hawaiian Islands are low sand islands a few acres in size; the largest, covering about 0.5 to 1.5 square miles, are Laysan Island, Lisianski Island, Green Island at Kure Atoll, and Sand and Eastern Islands at Midway Atoll.

There are six major breeding colonies of Hawaiian monk seals. These are located at French Frigate Shoals, Laysan Island, Lisianski Island, Pearl and Hermes Reef, the Midway Islands, and Kure Atoll. Because most monk seals return to their island of birth to rest, molt, and pup, each of these constitutes a relatively discrete breeding colony. However, the close proximity of the chain's three westernmost atolls (Kure, Midway, and Pearl and Hermes Reef), there is a greater degree of inter-atoll movement at these sites compared with the islands located at the eastern end of the Northwestern Hawaiian Islands.

The current size of the Hawaiian monk seal population is estimated at 1,300 to 1,400 animals. This

estimate appears to be less than half its abundance in the late 1950s when the first relatively complete monk seal counts were made. There are no reliable estimates of abundance before then, but considering intense human activity during World War II and human occupation of some islands dating back to the early 1900s, it is possible that monk seal numbers observed in the 1950s were already reduced from previous levels.

Relatively few counts of monk seals were made during the 1960s or 1970s, and by the early 1980s when the National Marine Fisheries Service began yearly monitoring, counts were about 40 percent lower than those made in the late 1950s. The sharpest declines were at the western end of the species' range. The colony at Midway, where counts as high as 60 seals were made in the 1950s, all but disappeared, and counts at Pearl and Hermes Reef and Kure Atoll declined by nearly 90 and 75 percent, respectively. During the early 1980s the overall population appeared to be increasing slightly, with counts at French Frigate Shoals increasing rapidly and counts at other colonies stable or increasing slightly. By 1985 the French Frigate Shoals colony had grown to a point where it included nearly half of the entire population. Then, between the late-1980s and mid-1990s, the overall population again declined due to a sharp decrease at French Frigate Shoals, where mean beach counts (excluding pups) plummeted from nearly 300 seals in 1985 to about 100 animals in 1995. Since 1995 the total population size has been relatively stable, with the decline in beach counts at French Frigate Shoals slowing somewhat and counts at other breeding colonies remaining stable or continuing to grow at a steady rate.

A variety of natural and human factors appears to have contributed to the declines and slow recovery rates at the various monk seal colonies. Among the natural factors are shark predation, die-offs due to biotoxins or disease, natural changes in environmental conditions that have affected prey availability, attacks on female and juvenile seals by aggressive adult males attempting to mate, and the limited extent of suitable pupping and haul-out beaches. Human factors include disturbance of seals on haul-out beaches, interactions with commercial fishermen and their gear, entanglement in lost and discarded fishing gear and other

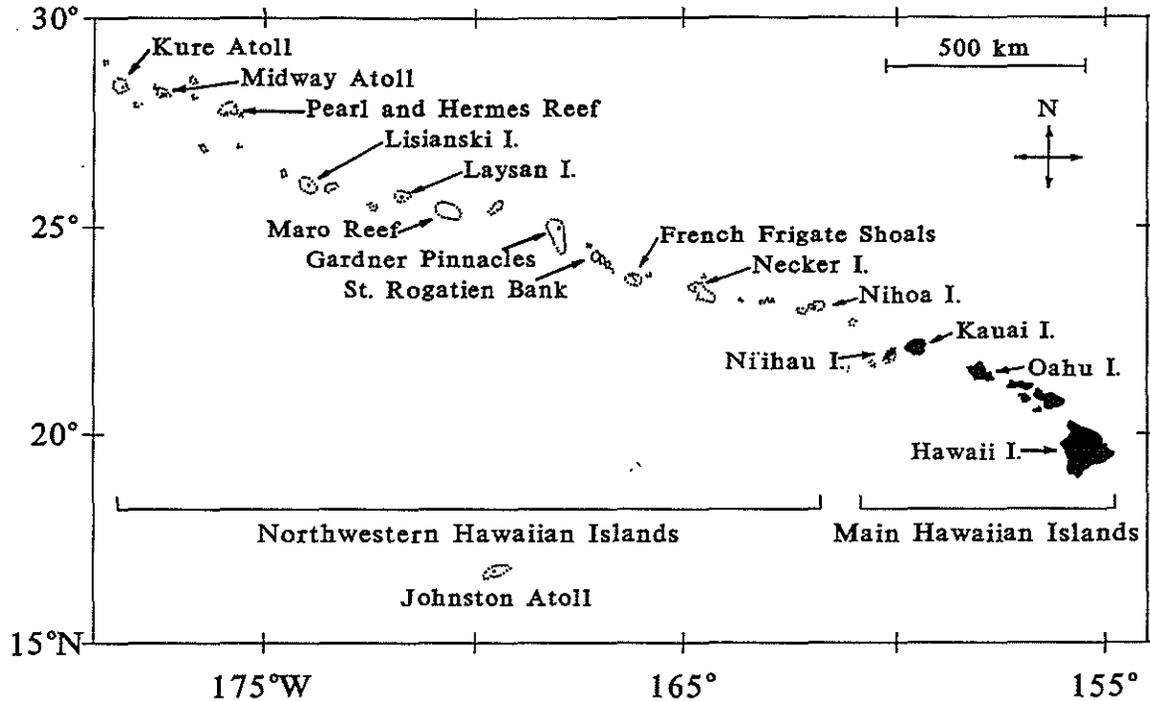


Figure 2. The Hawaiian Archipelago. The Northwestern Hawaiian Islands provide pupping beaches for all major breeding colonies of Hawaiian monk seals.

marine debris, entrapment behind deteriorating seawalls, environmental contamination, and depletion of prey resources by commercial fishing.

At each colony, differing combinations of these factors likely have contributed to local trends in abundance, with the relative importance of individual factors changing over time. For example, human disturbance was probably the principal cause of declines before the 1980s. As noted above, between the 1950s and 1980s some of the largest declines occurred at colonies in the western end of the Northwestern Hawaiian Islands where most human activity was concentrated. In the mid-1950s the Navy undertook a major expansion of its Naval Air Station on the Midway Islands, and in 1960 the Coast Guard established a LORAN station occupied by a staff of 18 to 20 people on Kure Atoll. With little understanding or awareness of the possible effects of disturbing monk seals, personnel stationed at these facilities and their pets likely walked the beaches, chasing resting pups and other seals into the water where shark predation poses an ever-present risk. With repeated disturbance

and few alternative hauling sites, preferred pupping beaches were abandoned and pup mortality increased.

Since the early 1980s steps have been taken to prevent human disturbance of monk seals, and the western colonies have begun to increase slowly. Other factors, however, may now limit their recovery. For example, accumulations of lost and discarded fishing gear have increased the likelihood of seals becoming entangled and drowned, and pollution from discarded equipment and years of human use may have worked its way into atoll food chains, affecting the health of resident animals. At other locations, where human disturbance may have been less extensive, different combinations of factors may have contributed to declines and limited population growth. Trends in monk seal abundance at the six major breeding colonies since the early 1980s are shown in Figure 3.

The National Marine Fisheries Service has lead responsibility for protecting Hawaiian monk seals under the Endangered Species Act and the Marine

Mammal Protection Act. To guide recovery efforts, the Service adopted a Hawaiian Monk Seal Recovery Plan in 1983, established a Hawaiian Monk Seal Recovery Team that now meets annually, designated all beaches and waters out to 20 fathoms around the Northwestern Hawaiian Islands (with the exception of Sand Island at Midway) as critical habitat, and implemented a research and monitoring program that now covers all major breeding locations. As discussed in previous annual reports, the Marine Mammal Commission provided recommendations and assistance to initiate all of these efforts. Since then, it has continued to provide advice on priority research and management needs.

Because all of the Northwestern Hawaiian Islands except Kure Atoll, which is owned by the State of Hawaii, lie within either the Hawaiian Islands National Wildlife Refuge or the Midway Islands National Wildlife Refuge, the Fish and Wildlife Service also plays an important role in protecting Hawaiian monk seals and their habitat. Efforts by the Marine Mammal Commission to help the Fish and Wildlife Service replace a deteriorating seawall, needed to maintain logistical support of research and management work at French Frigate Shoals, and with the transfer of the Midway Islands from the Navy to the Service for use as a national wildlife refuge are discussed in past annual reports. Other agencies and groups involved in monk seal recovery work include the Navy, the Coast Guard, the Army Corps of Engineers, the Western Pacific Regional Fisheries Management Council, the Hawaii Department of Land and Natural Resources, the University of Hawaii and its Sea Grant College Program, the Hawai'i Wildlife Fund, and the Center for Marine Conservation.

Hawaiian monk seal conservation and recovery efforts during 1999 are discussed below.

Prey Availability and Commercial Lobster Fishing

The steady increase in monk seal numbers at French Frigate Shoals during the 1970s and early 1980s reversed into a sharp decline in the late-1980s due to an abrupt decrease in juvenile survival rates. Whereas first-year survival rates for pups at the atoll

in the early 1980s were between 80 and 90 percent, they plunged to as low as 15 percent between the mid-1980s and 1998. Thus, over the past decade, almost no pups survived to breeding age, usually about 5 to 7 years. Although the first-year survival increased to about 50 percent for the 1998 cohort of pups, it remains far below levels seen early in the 1980s.

The most likely explanation for poor juvenile survival at this site is decreased prey availability. Although other factors may have contributed, Service researchers concluded that, during the mid- to late-1980s, the colony either had grown to a point where it exceeded its carrying capacity, its carrying capacity had declined, or both. Evidence of limited prey availability included small and, in some cases, emaciated pups, nursing females that were smaller and thinner than those at other colonies, and a delay in the age of first reproduction to 11 or 12 years of age for most females. Because of poor juvenile survival over the past decade, the colony now consists almost entirely of seals 10 years of age or older. As older animals die or reach reproductive senescence, it is expected that pup production at French Frigate Shoals, which has accounted for up to half of all monk seal pups since the early 1980s, will drop significantly, perhaps further exacerbating the colony's decline.

The monk seal decline at French Frigate Shoals started shortly after commercial lobster fishing began in the Northwestern Hawaiian Islands early in the 1980s. Most fishing was concentrated at three banks in the eastern end of the chain (Necker Island, Maro Reef, and Gardner Pinnacles) east and west of French Frigate Shoals. Based on analyses of monk seal scat and spew samples, monk seals are known to eat lobsters as well as small reef fish, octopuses, and crabs. The relative importance of different prey items is difficult to assess from scat samples and, although lobsters were a small proportion of prey items identified in scats, the Commission became concerned that lobsters could be important prey items, especially for young seals. Studies of other pinnipeds have found that, as young seals mature, their diets shift from crustaceans to fish, and it seemed possible that young monk seals learning to feed could depend more on lobsters for food than adult seals (*e.g.*, slow-moving lobsters may be somewhat easier to catch than fish for young seals with poorly developed foraging skills).

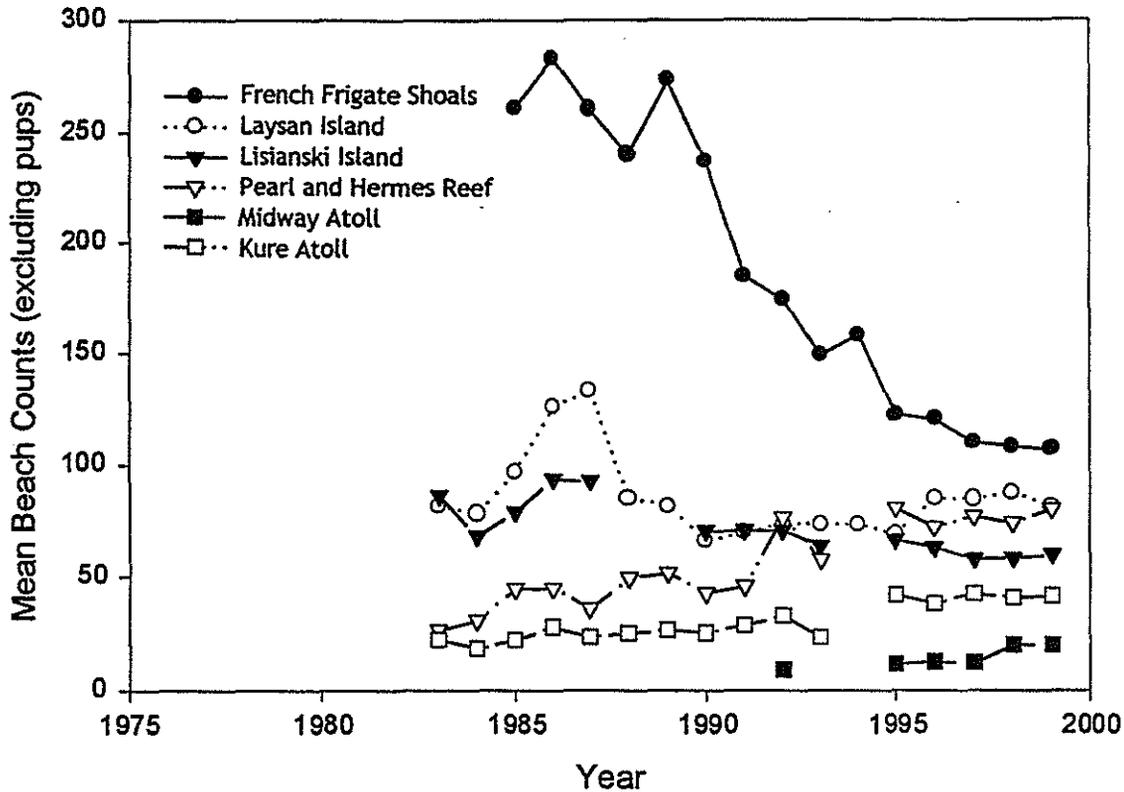


Figure 3. Mean beach counts of Hawaiian monk seals at major breeding colonies from 1983 through 1999. (Source: National Marine Fisheries Service, unpublished data)

Given the alarming decline in juvenile survival at French Frigate Shoals, the evidence linking decline to limited prey availability, and the belief that young seals probably learn to forage at the atoll of their birth, the Commission recommended in 1994 that the Service consider closing French Frigate Shoals to lobster fishing pending the development of better information on the importance of lobsters in monk seal diets. The Service and the Western Pacific Regional Fisheries Management Council considered the recommended action but took no steps to implement it. Instead, they concluded that there was insufficient evidence to demonstrate that lobsters were important prey for monk seals or that lobster fishing had caused the decline in the French Frigate Shoals monk seal colony. They also noted that there had been little lobster fishing reported at French Frigate Shoals, and that prey availability may have been reduced by natural environmental changes.

Notwithstanding these points, the Commission remained concerned and continued to believe that, as a precautionary step, lobster fishing should be suspended at French Frigate Shoals pending better information on lobster in monk seal diets. Between 1995 and 1998 it continued to recommend that the measure be adopted. In addition to the reasons for concern already noted, the Commission pointed out that octopuses, crabs, and small reef fish taken as bycatch in lobster traps also were eaten by monk seals, that large declines in catch rates at banks fished since the lobster fishery began indicated fishing could significantly decrease lobster abundance at individual banks in the Northwestern Hawaiian Islands, and that, although factors other than lobster fishing may have been the principal cause of the decline in French Frigate Shoals monk seal numbers, lobster fishing could further reduce the monk seals' already limited food supply and thereby exacerbate constraints to potential monk seal recovery. To resolve uncertainties about the importance of lobsters in monk seal

diets, the Commission recommended that the Service undertake satellite tracking studies to determine where monk seals feed and initiate studies using fatty acid signatures of prey species in blubber samples to determine the composition of monk seal diets.

A satellite tracking study was subsequently undertaken by researchers at the University of Minnesota in collaboration with the Service, and in 1997 the Service began funding research on fatty acid signatures of monk seal prey. However, the Service continued to reject the Commission's repeated recommendations to limit lobster fishing at French Frigate Shoals pending results of the research. In doing so, the Service cited a lack of evidence about potential effects of the fishery on monk seals and noted that management measures being developed to protect lobster stocks would serve to prevent monk seal prey resources from being jeopardized. In late 1997 preliminary findings of the fatty acid signature studies indicated that the technique held potential for resolving questions about monk seal prey species and that lobsters may be a more important dietary component than previously thought. However, because the results were preliminary, the Service did not consider them in its assessment of potential effects of lobster fishing on monk seals.

In 1998 the Service, at the recommendation of the Western Pacific Regional Fisheries Management Council, adopted a new bank-specific catch guideline (*i.e.*, quota) for lobster fishing in the Northwestern Hawaiian Islands. Whereas previously single area-wide catch limits had been set for lobsters, the new catch guideline set separate catch limits for four areas: Maro Reef, Gardner Pinnacles, Necker Island, and "Area 4," which included all remaining banks in the island chain. The purpose of the measure was to reduce fishing pressure at Maro Reef, Gardner Pinnacles, and Necker Island, where declining lobster stocks could no longer sustain past levels of fishing effort, and to encourage fishing at other banks where little or no lobster fishing had occurred. As a result, in 1998 lobster fishing was reported for the first time in many years at French Frigate Shoals, as well as at other banks supporting major monk seal colonies.

As noted in last year's annual report, in the summer of 1998 one of the lobster fishing vessels ran

aground at Kure Atoll. It was carrying about 7.5 miles of line, 500 traps, and 7,500 gallons of fuel. The crew was rescued safely and 4,000 gallons of fuel were removed; however, lacking funds and resources to return to the wreck, the vessel soon broke up releasing the remaining fuel, line, and traps. The Commission and the recovery team urged the Service to secure funding or assistance to clean up the wreck and debris, but it was not able to do so before the end of 1998. During 1999, however, it was the Commission's understanding that the Service had removed some of the line, and about 450 traps had been either picked up from the island shoreline or pulled from the wreck site.

For the 1999 lobster fishing season, the Service, at the recommendation of the regional fisheries management council, considered making the bank-specific harvest guidelines first tried in 1998 a permanent part of the lobster fishery management program. Concerned about the action's intent to increase fishing in key monk seal foraging areas and its potential to reduce prey resources, the Commission wrote to the Service on 31 December 1998, 13 May 1999, and 30 June 1999 opposing the idea. It also wrote to the Western Pacific Regional Fisheries Management Council on 13 May 1999 and the Hawaii Department of Land and Natural Resources on 27 May 1999.

In its letters, the Commission noted that the long decline and seriously depleted status of Hawaiian monk seals required application of precautionary management principles that take into account the possible effects of lobster fishing on monk seals. It again recommended that the Service immediately close French Frigate Shoals to lobster fishing until better information is available on the importance of lobsters in monk seal diets and the effects of lobster fishing on monk seal prey resources. To avoid possible impacts on other recovering but still seriously depleted monk seal colonies, the Commission recommended that the Service immediately prohibit lobster fishing at all other atolls that support major monk seal colonies pending further research on monk seal prey preferences and abundances. To respond to future vessel groundings as had occurred in 1998, the Commission urged that steps be taken to ensure that funding would be adequate to mount an effective clean-up effort in the event of a new accident.

The Service responded to the Commission's letters on 5 August 1999, noting that it did not agree with the Commission's recommendations to prohibit lobster fishing at atolls supporting major monk seal colonies. In this regard, the Service enclosed its informal consultation finding prepared on the proposed 1999 harvest guideline pursuant to section 7 of the Endangered Species Act. The 7 June 1999 finding concluded that there is no evidence to suggest that the guideline or the establishment of permanent lobster fishing areas in the Northwestern Hawaiian Islands is likely to adversely affect Hawaiian monk seals. It recommended that further research be undertaken on monk seal prey preferences and that no more than 20 percent of the lobster catch limit established for Area 4 (all banks other than Maro Reef, Gardner Pinnacles, and Necker Island) be taken at any one bank. The Service therefore advised the Commission that it had published final rules on 8 July 1999 adopting the 1999 harvest guidelines as proposed with a 20 percent catch limit from any one bank in Area 4, and it took no action to prohibit lobster fishing at major monk seal colonies.

As indicated above, the Commission believes that, in the absence of evidence showing that the fishery does not affect prey availability, both the Endangered Species Act and common sense dictate that precautionary measures be taken to ensure that the fishery is not causing or contributing to the observed population decline. Therefore, to pursue the matter, the Commission asked representatives of the Service to review its lobster fishery management program and the results of the 1999 fishing season at the Marine Mammal Commission's 19-21 October 1999 annual meeting. During that meeting, the Commission was advised that the Service planned to reexamine the lobster fishery pursuant to section 7 of the Endangered Species Act before the next fishing season and that actions to close French Frigate Shoals and other locations would be reconsidered. No information was provided to allay the Commission's concern about the possible effects of lobster fishing on monk seal prey resources or the prudence of applying a precautionary management approach in light of current uncertainties about both monk seal diets and prey abundances.

The Commission therefore wrote to the Service on 23 November 1999 noting that it was pleased that

the Service would reconsider the issue in 2000, but that by acting to direct lobster fishing toward major monk seal breeding atolls it believed the Service had increased the risk of adversely affecting monk seals by possibly reducing essential prey resources in the species' most important feeding areas. The Commission therefore again recommended that the Service prohibit lobster fishing at all major monk seal breeding atolls until there is sufficient information to assess (1) the relative importance of lobsters and other monk seal prey species taken by the fishery in the diet of different age and sex classes of Hawaiian monk seals, and (2) the effects of lobster fishing on the availability of important monk seal prey resources.

On 7-8 December 1999 the Hawaiian Monk Seal Recovery Team met to review information and developments concerning the species' recovery. During the meeting, new information was provided on the results of studies to assess prey preferences based on analyses of prey fatty acid signatures in monk seal blubber samples. Preliminary results presented at the meeting revealed that lobsters probably constitute a significant percentage of the diet of most juvenile and adult female monk seals at French Frigate Shoals, but only a small proportion of the diet of adult male monk seals. As of the end of 1999 the recovery team had not yet provided the Service with recommendations based on this new information, but it was the Commission's understanding that it was considering recommendations similar to those of the Commission (*i.e.*, closing all breeding atolls to lobster fishing).

Longline Fishing

In 1990 there were reports of interactions between Hawaiian monk seals and a rapidly expanding pelagic longline fishery for swordfish that had begun operating near major monk seal breeding atolls. Several monk seals were soon found with longline hooks imbedded in their mouths and skin. In response, the National Marine Fisheries Service, at the recommendation of the Western Pacific Regional Fisheries Management Council, and with support from the Marine Mammal Commission and the Fish and Wildlife Service, established a protected species management zone around the Northwestern Hawaiian Islands. Under the measure, pelagic longline fishing was prohibited anywhere within 50 nmi of the North-

western Hawaiian Islands. Since that time, no seals have been found with longline hooks imbedded in them.

In 1999 a single vessel began fishing for sharks in shallow reef areas of the Northwestern Hawaiian Islands using a bottom longline with approximately 400 baited hooks. Although the Western Pacific Regional Fisheries Management Council was advised early in 1999 of plans to start the fishery, the Council had no fishery management plan in place for shark bottom longline fishing, and management measures adopted for the pelagic longline fishery did not apply because shark longlines are not set at the surface. As a result, the vessel left port to begin fishing in the summer of 1999 with no measures in place to limit its catch or prevent possible effects on protected species. When the vessel returned to port after fishing at French Frigate Shoals, the National Marine Fisheries Service placed an observer aboard the vessel, which then began fishing at Gardner Pinnacles. No interactions with Hawaiian monk seals were reported while the observer was aboard.

At the Marine Mammal Commission's 19-21 October 1999 annual meeting, a representative of the Service advised the Commission of this situation. He also noted that the Service believed it was likely that monk seals would be hooked if the bottom longline shark fishery continued, and that the Western Pacific Regional Fisheries Management Council was expected to consider action to close the fishery in 2000. The Commission also was concerned about the likelihood of monk seals getting caught or entangled in shark longlines. Therefore, in its letter of 23 November 1999 to the Service, it recommended that the Service prohibit longline fishing for sharks within 50 nmi of the Northwestern Hawaiian Islands pending development and review of a fishery management plan for sharks.

To ensure that other new fisheries possibly affecting monk seals do not begin without careful prior assessment of management needs, the Commission also recommended that the Service establish a rule prohibiting all commercial fishing within 50 nmi of the Northwestern Hawaiian Islands unless and until an applicable fishery management plan has been developed and reviewed for potential impacts on monk

seals pursuant to consultation provisions of section 7 of the Endangered Species Act.

Enhancing Survival of Pups Born at French Frigate Shoals

As noted above, the French Frigate Shoals monk seal colony began a sharp decline in the late-1980s due to poor juvenile survival thought to be caused by limited prey availability. To enhance survival of weaned pups and rebuild the colony at Kure Atoll where there was no evidence of prey limitations, the National Marine Fisheries Service began a program in 1984 to rescue underweight pups from French Frigate Shoals, rehabilitate them at facilities on Oahu, and release them at Kure Atoll. The effort has helped to speed the recovery of the Kure Atoll colony; many animals moved to Kure and some of their offspring are now producing pups.

Translocations to Midway Atoll — When the Navy announced plans to close its Naval Air Station at Midway Atoll and began steps to transfer the atoll to the Fish and Wildlife Service, the Marine Mammal Commission and the recovery team recommended that the release site for seals rescued from French Frigate Shoals be switched from Kure Atoll to the Midway Islands to help reestablish a colony there. This was done in late 1992 and early 1993, but most translocated animals soon disappeared or were found dead. Further releases at Midway were therefore suspended pending a review of the translocation effort at that site and captured seals were again released at Kure Atoll.

The review suggested that the different release procedures used at Midway, prompted in part by limited funding, had contributed to the high mortality. Handling protocols were therefore changed and plans for moving seals to Midway resumed in 1995 when 12 pups were captured. Before they could be released at Midway, however, most of the seals developed a previously unobserved eye problem, and translocation work was again suspended. The eye problem persisted, resulting in blindness in most animals, which prevented their release. In 1999 the seals captured in 1995 were transferred to Sea World in Texas where they will be kept permanently for research and public education purposes.

At the recommendation of the Commission and the recovery team, another attempt to capture and translocate seals was planned for 1998. To minimize risks of similar health problems, it was decided to hold and fatten the seals in pens in the field and then move them directly to Midway, rather than moving them to facilities on Oahu for rehabilitation. Before work could begin, however, health and disease studies carried out in anticipation of the translocation revealed the possible presence of antibodies to morbillivirus in three of the seals tested from French Frigate Shoals; no signs of the antibodies were found in seals from other atolls.

Given the possible exposure of seals at French Frigate Shoals to morbillivirus and the risk of spreading the virus from one colony to another, the Commission, by letter of 31 December 1998, and the Hawaiian Monk Seal Recovery Team recommended postponing planned translocation work until further studies to confirm evidence of past exposure to the virus could be completed. In its letter, the Commission also recommended that if translocation work were suspended, funds allocated to the translocation work should be redirected to a headstart program similar to one successfully carried out at Kure Atoll in the 1980s. In that program, weaned pups were maintained during the first months after weaning in an enclosure built at the atoll to increase their first-year survival prospects.

In 1999 no translocation work was undertaken and more than 100 monk seals were sampled to resolve uncertainties about the possible past exposure of seals to morbillivirus. Among the sampled seals were two of the three animals that tested positive in 1998. The results revealed no signs of morbillivirus antibodies in any of the tested animals. The involved veterinarians therefore concluded that the 1998 test results were caused by false positives, and that the virus was not present at French Frigate Shoals or other colonies. In light of these findings, the Service began developing plans to renew the translocation of young seals from French Frigate Shoals to the Midway Islands in 2000. At the end of 1999, however, the Service suspended plans in this regard. It did so because first-year survival rates for seals born at French Frigate Shoals in 1998 had increased from about 15 to 50 percent and because the Service

planned to further enhance juvenile survival at French Frigate Shoals in 2000 by reducing shark predation (see below) at the atoll. With regard to the Commission's recommendation that funds for translocation work in 1998 be redirected to a headstart program at French Frigate Shoals, no action was taken because the funds were instead used for the health assessment work and assessing juvenile survival.

Adult male aggression — Although reduced prey availability appears to have been the principal factor underlying poor juvenile survival at French Frigate Shoals, several other factors have contributed to juvenile mortality at this site, including attacks on pups by adult males. In 1997 Service researchers observed a high number of incidents involving adult male aggression toward pups, most of which were caused by two identified animals. After the same animals again began attacking pups early in 1998, both were captured and moved to Johnston Atoll, about 1,125 km south of French Frigate Shoals. Since their removal in June 1998, evidence of male aggression toward pups at French Frigate Shoals has decreased substantially, and neither male has been resighted at the atoll.

Shark predation — Shark predation is another factor affecting juvenile survival. Pups, which have not yet learned to avoid sharks, are particularly vulnerable, and the frequency of shark predation at French Frigate Shoals appears to have increased in recent years. At its 19-21 October 1999 annual meeting, the Commission received information from the Service indicating that perhaps 30 percent of pup mortality at French Frigate Shoals in 1998 was due to sharks. This high level of predation may be partly related to a change in pupping sites brought about by erosion at Whaleskate Island, which until recently has been one of the most important pupping sites at the atoll. Over the past few years, however, erosion has left the island awash most of the time and seals formerly using the island have moved to other islands at the atoll, particularly Trig Island, where incidents of shark predation, as well as aggressive male behavior, have been high. Most shark attacks observed in 1998 and 1999 involved Galapagos sharks patrolling the Trig Island shoreline (Fig. 4). The number of such sharks observed near the pupping beaches appears to have increased substantially in recent years.



Figure 4. Sharks patrolling the shoreline along Trig Island, a Hawaiian monk seal pupping beach at French Frigate Shoals. (Photograph by Mitch Craig, courtesy National Marine Fisheries Service)

From tags placed on sharks around the island in 1999, Service researchers determined that at least 14 sharks, and perhaps many more, were patrolling the island's shoreline.

Given information presented at its meeting, the Commission shared the Service's concern that shark predation had become a significant threat to the recovery of the French Frigate Shoals monk seal colony and concluded that steps were urgently needed to reduce the number of Galapagos sharks patrolling waters near Trig Island. The Commission was not supportive of a large-scale shark reduction program at the atoll because of the importance of shark predation in the atoll's marine ecosystem. However, recognizing the possibility that increased shark predation was caused by a relatively small number of Galapagos sharks that had recently learned to prey on juvenile monk seals, it seemed possible that shark predation on monk seals could be significantly reduced without disrupting the atoll's shark population by eliminating those few sharks. Therefore, in its 23 November 1999 letter, the Commission recommended that the Service consult with staff of the Fish and Wildlife

Service's Hawaiian Islands National Wildlife Refuge to identify and undertake methods to selectively cull Galapagos sharks patrolling waters off Trig Island using methods that were unlikely to incidentally catch monk seals.

Marine Debris

Another factor affecting juvenile monk seal mortality at French Frigate Shoals and other atolls is entanglement in lost and discarded fishing gear, particularly derelict fishing nets. Since the early 1980s National Marine Fisheries Service field crews have observed more than 150 entangled monk seals. Although some seals were able to free themselves, researchers have found it necessary to intervene and remove the attached material in most cases. In 1999, 25 entangled monk seals were seen during field visits to most major breeding sites. The period of observation ranged from about two to nine months except at Midway Atoll, which was occupied all year. Six entangled seals were able to free themselves and 19 were freed by researchers. Young monk seals are far more prone to entanglement than adults. Of the 25

monk seals entangled in 1999, 10 were pups, 2 were juveniles, 4 were subadults, and 9 were adults. In recent years, the number of observed entanglements has increased, although this may reflect an increase in time spent on the atolls by researchers.

As noted in past annual reports, early in the 1980s the Marine Mammal Commission was instrumental in expanding awareness of the global extent of marine debris pollution and its effects on many species of wildlife. The Commission's initial concern in this regard stemmed in part from reports of entangled Hawaiian monk seals. Although most of the reports involved animals seen hauling out on beaches entangled in relatively small pieces of debris, the Commission was (and remains) concerned that a far greater number of unobserved seals may be caught and drowned at sea in debris too large to allow animals to swim ashore.

To help assess this possibility for Hawaiian monk seals, the National Marine Fisheries Service conducted a diver survey of marine debris caught in reefs at French Frigate Shoals during the winter of 1996-1997. The survey found that the number of net fragments snagged on coral heads and reef rubble was far greater than expected. From the small areas sampled, it was estimated that there were up to 94 net fragments per square kilometer, and more than 29,000 net fragments in waters less than 10 m deep at French Frigate Shoals alone. Most of the netting appeared to be trawl webbing. Although its origin is unclear, no trawl or gillnet fishing occurs in the Northwestern Hawaiian Islands, and it is assumed that virtually all of the debris has been transported by ocean currents from fishing grounds around the rim of the North Pacific Ocean. In addition to posing entanglement risks for monk seals, sea turtles, and other species, the derelict nets damaged and caught tons of coral.

Despite the daunting task of collecting this debris, the National Marine Fisheries Service took steps to organize cooperative diver clean-up efforts in both 1998 and 1999. Agencies and groups contributing divers, boats, services, or other assistance included (in alphabetical order) BFI Industries, the Center for Marine Conservation, the City and County of Honolulu, the Coast Guard, the Fish and Wildlife Service, the Hawai'i Wildlife Fund, the Navy, the State of

Hawaii, the University of Hawaii Sea Grant College Program, and the University of Alaska Marine Advisory Program. In both years, grants to help fund the work were provided to the Service by the National Fish and Wildlife Foundation. In both years the Commission commented to the Foundation in support of the grants.

In 1998 during six days of clean-up work at French Frigate Shoals, divers removed approximately six tons (5,500 kg) of debris from 1.5 square kilometers of reef near major pupping beaches. In 1999 clean-up efforts were expanded and shifted to reefs near pupping beaches on Lisianski Island, where the largest numbers of entangled monk seals have been recorded, and Pearl and Hermes Reef. In 1999 about 25 tons of debris were removed from the two sites combined (Fig. 5). For 2000 the Service plans to substantially increase its funding for the cooperative clean-up efforts in order to increase both the number of divers and the duration of their clean-up visits.

In the course of the offshore clean-up work, divers have encountered several seals badly entangled in large derelict net fragments hung up on coral heads. Two seals were found during the initial survey in 1997 (one drowned and the other was released alive). In addition monk seal field crews found and released four seals entangled in debris caught in reefs in 1999. The results suggest that, in at least some cases, both the amounts and effects of hazardous marine debris at sea have been greatly underestimated and that entanglement can be a far more serious source of mortality for marine species than generally recognized.

Although the origin of net debris in the Northwestern Hawaiian Islands is uncertain, most net fragments are thought to come from distant fisheries located around the North Pacific rim. This is suggested in part by the presence of glass floats used in Asian net fisheries. To focus international attention on the need to minimize marine debris in the North Pacific, in June 1999 the Department of State, in consultation with the National Marine Fisheries Service, the Marine Mammal Commission, and other federal agencies, cabled its embassies and posts in Russia, China, Japan, Korea, the Philippines, and Taiwan. The cable asked that the issue of marine debris be



Figure 5. Derelict netting being removed from the reefs at Pearl and Hermes Reef, October 1999. (Photograph by Mark Sranek, courtesy National Marine Fisheries Service)

raised with appropriate officials of the host governments. In particular, the cable asked that local officials be advised of the problems created by marine debris in the North Pacific, particularly net debris in the Northwestern Hawaiian Islands, and that they be asked about (1) their willingness to participate in an international workshop to be hosted by the United States in 2000 on marine debris issues in the North Pacific, and (2) efforts being taken by their governments to implement Annex V of the International Convention for the Prevention of Pollution from Ships. As discussed in previous annual reports, Annex V became effective in 1988 and includes provisions prohibiting the intentional discard of all plastics from ships at sea, including old nets and net scraps generated during net repairs.

In addition, the Department of State submitted an information paper for a meeting of the International Maritime Organization's (IMO) Marine Environment Protection Committee scheduled for March 2000. The IMO oversees matters pertaining to Annex V. The paper describes the impacts of marine debris on monk seals as well as other marine species in the North Pacific and U.S. efforts to enforce provisions of Annex V. Noting that debris problems have continued despite adoption of the Annex by 92 nations, the paper urges IMO members to increase enforcement efforts related to Annex V.

Funding

During the past five years, the National Marine Fisheries Service has significantly increased funding

levels for the Hawaiian monk seal recovery program. In 1999 nearly \$1.5 million was allocated for recovery work, only about half of which was programmed in the Service's base-level funding request for the program. For 2000 the Service's initial budget request included a \$2 million increase in the base level funding request in recognition of the Hawaiian monk seal program's long-term funding needs. The requested increase, however, was subsequently reduced and for fiscal year 2000 the Service's appropriation included no increase for work on Hawaiian monk seals. As a result, there remains a severe funding shortfall for activities planned during 2000 to assess monk seal foraging needs, clean up derelict nets entangling monk seals, enhance survival of pups born at French Frigate Shoals, and continue health and disease studies.

Given its understanding of the above developments, the Commission wrote to the National Marine Fisheries Service on 14 December 1999. In its letter, the Commission recommended that the Service take steps to reallocate resources, seek supplemental funds, and restructure out-year budget requests so as to meet the needs that prompted the initial fiscal year 2000 increase in base-level funding for the Hawaiian monk seal recovery program.

Steller Sea Lion **(*Eumetopias jubatus*)**

Steller sea lions range along the rim of the North Pacific Ocean from the Channel Islands in southern California to Hokkaido, Japan, with centers of abundance in the Aleutian Islands and the Gulf of Alaska. Although some individuals, particularly juveniles and adult males, disperse widely outside the breeding season (late May to early July), animals tend to return to their natal rookeries to breed. About three-fourths of all Steller sea lions haul out and pup in U.S. territory. Over the past 30 years, Steller sea lion abundance has declined dramatically throughout the central and western part of its range (Table 4). The number of Steller sea lions at many sites has declined by more than 80 percent since the mid- and late 1970s, and sea lions have all but disappeared at some sites. Because of this trend, in 1990 the National

Marine Fisheries Service designated the Steller sea lion as threatened under the Endangered Species Act.

The cause of the decline is uncertain and may reflect a number of factors. The most commonly held hypotheses are that available prey resources have decreased in abundance or there has been a significant change in prey species composition, either of which may have led to an increase in sea lion mortality, particularly among juveniles. Steller sea lions are known to eat Atka mackerel, walleye pollock, salmon, herring and flatfishes, all of which are taken by commercial fisheries. The extensive commercial fisheries in Alaska waters therefore may be, either directly or indirectly, a significant factor affecting prey availability for Steller sea lions. Other possible factors contributing to the species' decline include incidental taking by foreign and joint-venture trawl fisheries from the late 1960s through the late 1980s, human disturbance at haul-out sites, deliberate shooting, a commercial sea lion harvest in parts of Alaska from the 1950s to the early 1970s, hunting in British Columbia from the early 1900s to the early 1960s to reduce predation on commercial fish stocks, subsistence hunting by Natives in Alaska and Russia, and environmental perturbations.

The National Marine Fisheries Service has lead responsibility for the recovery of Steller sea lions under the Marine Mammal Protection Act and the Endangered Species Act. At the recommendation of the Marine Mammal Commission, among others, the Service established the Steller Sea Lion Recovery Team in 1990 and adopted the Steller Sea Lion Recovery Plan in 1992 to help guide recovery efforts. Key partners in the Service's recovery program include the Alaska Department of Fish and Game, the North Pacific Fishery Management Council, and the North Pacific Universities Marine Mammal Research Consortium. The latter group, a consortium of academic institutions in Alaska, British Columbia, Oregon, and Washington, was established in 1992 at the request of fishing industries to investigate the causes of the Steller sea lion decline.

To mitigate possible effects of commercial fisheries on Steller sea lions, the Service established regulations in 1992 and 1993 to (1) prohibit discharge of firearms within 91.4 meters (100 yards) of a sea lion, (2)

Table 4. Counts of adult and juvenile (non-pup) Steller sea lions observed at rookery and haul-out trend sites in seven Alaska subareas during June and July aerial surveys, 1976-1998

Year	Southeast Alaska	Gulf of Alaska			Aleutian Islands		
		Eastern	Central	Western	Eastern	Central	Western
1976	*	7,053	24,678	8,311	19,743	*	*
1979	6,376	*	*	*	*	36,632	14,011
1985	*	*	19,002	6,275	7,505	23,042	*
1990	7,629	5,444	7,050	3,915	3,801	7,988	2,327
1991	7,715	4,596	6,273	3,734	4,231	7,499	3,085
1992	7,558	3,738	5,721	3,720	4,839	6,399	2,869
1994	8,826	3,369	4,520	3,982	4,421	5,790	2,037
1996	8,231	2,133	3,915	3,741	4,716	5,528	2,190
1997	*	*	3,352	3,633	*	*	*
1998	8,693*	*	3,346	3,361	3,847	5,761	1,913

* Indicates incomplete or no survey data.

Sources: Sease, J. L., J. P. Lewis, D. C. McAllister, R. L. Merrick, and S. M. Mellow. 1993. Aerial and ship-based surveys of Steller sea lions (*Eumetopias jubatus*) in Southeast Alaska, the Gulf of Alaska, and Aleutian Islands during June and July 1992. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-AFSC-17. 57 pp; National Marine Fisheries Service, unpublished data.
Sease, J. L., and T. R. Loughlin. 1999. Aerial and land-based surveys of Steller sea lions (*Eumetopias jubatus*) in Alaska, June and July 1997 and 1998. NOAA Technical Memorandum NMFS-AFSC-100. 61 pp.

prohibit (with some exceptions) the operation of fishing vessels within 3 nmi of major rookeries in Alaska, (3) establish no-trawl zones within 10 nmi of certain major sea lion rookeries in Alaska, and within 20 nmi of major rookeries in the eastern Aleutian Islands and the Bering Sea to protect sea lion foraging areas, and (4) adjust time and area catch allocations to prevent concentrated fishing effort in foraging areas beyond the no-trawl zones around major haul-out sites. In 1993 the Service also designated critical habitat to include all major rookeries and adjacent waters under U.S. jurisdiction. The designated areas

include waters within 20 nmi of major rookeries and haul-out sites west of Cape Suckling and within 3 nmi east of Cape Suckling. Three pelagic foraging areas also were designated as critical habitat in 1993. They are the Shelikof Strait area in the Gulf of Alaska, the Bogoslof area on the Bering Sea shelf, and the area incorporating Seguam Pass. Specific boundaries for these foraging areas are given in the Service's *Federal Register* notice of 27 August 1993. The Coast Guard conducts routine enforcement patrols in these areas by both airplane and ship.

The National Marine Fisheries Service, in cooperation with other agencies and groups, also has maintained an intensive research effort to monitor the status of Steller sea lions and to identify the cause or causes of the population decline. In addition to these ongoing collaborative studies, the Service has developed a long-term research plan to test the efficacy of no-trawl zones around Alaska Steller sea lion rookeries. The research, which will be undertaken in collaboration with other appropriate agencies and organizations, will incorporate four related studies. They are (1) a study to assess the impacts of commercial fishing on Atka mackerel distribution and abundance; (2) a study to assess the effect of commercial fishing on walleye pollock distribution and abundance; (3) studies of Steller sea lion biology, including condition and fitness; and (4) a study to assess the effects of different sizes of no-trawl zones on population trends and health of Steller sea lions.

Despite these efforts, the species' decline in the western portion of its range has continued. Recent efforts to address this situation are described below.

Steller Sea Lion Status under the Endangered Species Act

When Steller sea lions were designated as threatened under the Endangered Species Act in 1990, the designation applied throughout their range and treated the species as a single population. It is now known that the species is composed of at least two distinct stocks, one east and one west of 144° west longitude, near Cape Suckling in the north-central Gulf of Alaska (Fig. 6). Research initiated by the Service has documented genetic differences between the eastern and western stocks. The results indicate that there is little exchange of animals between rookeries and haul-out sites east and west of Cape Suckling. With the exception of a decline in Steller sea lion numbers at their southernmost rookeries in California, the eastern stock appears to be relatively stable or increasing slightly. Based on 1996 census data, there are at least 30,400 animals (including pups) in the eastern stock. This is a minimum estimate because no correction was made for animals missed because they were at sea. The western stock of Steller sea lions has experienced steady declines. Based on 1998 census data, 38,067

Steller sea lions, including pups, remain in the western population. This too is a minimum estimate because these data were not corrected for animals missed during the survey. On a more positive note, the Service has identified two new rookeries, one in southeastern Alaska near Yakutat and the other in the central Aleutian Islands on the Pacific Ocean side of Seguam Island.

In light of what is now known of Steller sea lion stock structure, the Steller Sea Lion Recovery Team and the Marine Mammal Commission recommended that the Service revise the species' listing under the Endangered Species Act to more accurately reflect the east-west stock division. The Service agreed that the change was warranted, and on 4 October 1995 it published a proposed rule in the *Federal Register* designating the stock west of 144° west longitude as endangered, while maintaining the threatened status for the stock east of this line. On 5 May 1997 the Service published final rules confirming these changes, effective 4 June 1997. In doing so, the Service noted that it did not appear necessary to modify designated critical habitat for Steller sea lions or existing protection measures. The Service did, however, indicate that it was taking steps to reassess the effectiveness of existing protective measures with a view toward improving them.

Section 7 Consultations on the Atka Mackerel and Walleye Pollock Fisheries

Section 7(a)(2) of the Endangered Species Act requires that every federal agency ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of its critical habitat. The development and implementation of fisheries management plans by the National Marine Fisheries Service and the Fishery Management Councils established pursuant to the Magnuson-Stevens Fishery Conservation and Management Act constitute such actions. If it is deemed that an action undertaken by a federal agency may adversely affect a protected species, then the federal agency must confer with the National Marine Fisheries Service or the Fish and Wildlife Service, depending on the species, to identify and determine ways to

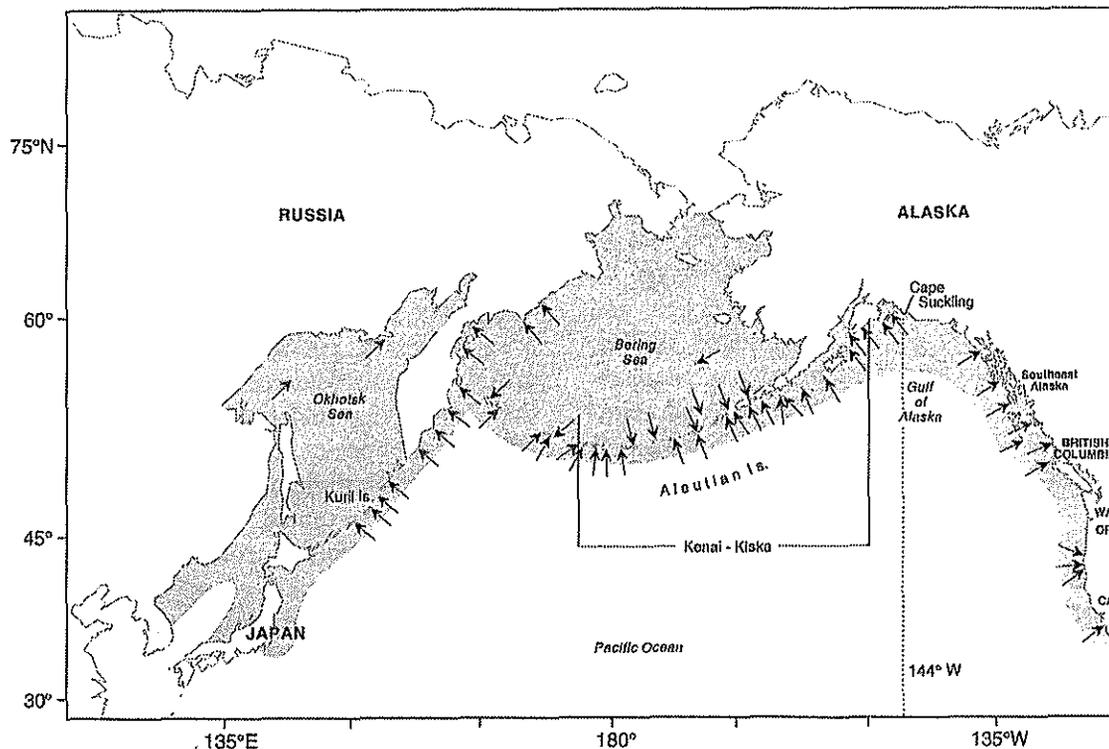


Figure 6. Ranges and rookery sites of the eastern and western stocks of the Steller sea lion. The dividing line falls at Cape Suckling, 144°W longitude.

resolve potential conflicts. Section 7(b) of the Act requires that the results of the consultation be published in a biological opinion detailing how the action may affect the species in question.

As mentioned earlier, abundance, seasonal availability and composition of prey species are thought to be factors possibly contributing to the Steller sea lion decline west of Cape Suckling. Large commercial groundfish fisheries occur in this area. Concerns that groundfish fisheries in the Gulf of Alaska and the Bering Sea/Aleutian Islands region may have an adverse effect on Steller sea lions have resulted in a number of section 7 consultations between the National Marine Fisheries Service's Office of Sustainable Fisheries and the Office of Protected Resources, also part of the Service. The first consultation took place in 1991. On 18 April 1991 the Service issued a biological opinion on the Bering Sea/Aleutian Islands fishery management plan and a second opinion on the fishery management plan for Gulf of Alaska ground-

fish fisheries, concluding that the respective fisheries were not likely to jeopardize the continued existence and recovery of the Steller sea lion.

In 1995 the Service reinitiated formal section 7 consultations on the possible effects on sea lions of the proposed Bering Sea/Aleutian Islands and Gulf of Alaska groundfish fishery management plans and on the proposed 1996 total allowable catch specification developed by the North Pacific Fisheries Management Council. Consultations were reinitiated because of new information on the fisheries and the continued Steller sea lion decline. On 26 January 1996 the Service issued two new biological opinions, both of which concluded that the fisheries and proposed 1996 catch quotas were not likely to jeopardize the continued existence of Steller sea lions or result in the destruction or adverse modification of their critical habitat.

On 26 February 1998 the Service determined that the 1996 biological opinion on the effects of the Bering Sea/Aleutian Islands groundfish fishery on Steller sea lions would remain valid for 1998. On 2 March 1998 the Service released a biological opinion that concluded that the Gulf of Alaska groundfish fishery also was not likely to jeopardize the continued existence of Steller sea lions; however, it did not address the Gulf of Alaska fisheries management plan beyond 1998.

Later in 1998 section 7 consultations were re-initiated on (1) the Atka mackerel fishery because new information indicated that localized depletion of Atka mackerel by this fishery may be having a detrimental effect on Steller sea lion foraging success; (2) the Bering Sea/Aleutian Islands walleye pollock fishery because of a new proposed scheme for allocating the total allowable catch of pollock to inshore/offshore sectors of the fishery, and because of continued concern that the fishery may compete with Steller sea lions; and (3) the Gulf of Alaska walleye pollock fishery because of concern that it may compete with Steller sea lions, and because the previous biological opinion was to expire at the end of 1998.

On 3 December 1998 the Service issued a biological opinion on (1) possible effects of the Atka mackerel fishery under the 1999-2002 Bering Sea/Aleutian Islands groundfish fisheries management plan, (2) the walleye pollock fishery under the 1999-2002 Bering Sea/Aleutian Islands groundfish fisheries management plan, and (3) the walleye pollock fishery under the 1999-2002 Gulf of Alaska groundfish plan.

The biological opinion concluded that, as proposed, the Atka mackerel fishery under the amended Bering Sea/Aleutian Islands groundfish fishery management plan would not appreciably reduce the likelihood of the survival and recovery of the Steller sea lion, provided proposed conservation measures included in the plan were fully implemented by 2002. Barring new information, the biological opinion would remain in effect through 2002.

The biological opinion considered the Bering Sea/Aleutian Islands region critical to the survival of the western population of Steller sea lions. It stated that the proposed Bering Sea/Aleutian Islands pollock

fishery would continue to concentrate the fishery in time and space, thus posing a serious threat to the survival of Steller sea lions. Because of the seasonal and regional concentration of catches, the biological opinion concluded that the Bering Sea/Aleutian Islands walleye pollock fishery was likely to jeopardize the continued existence of Steller sea lions and adversely modify their critical habitat.

The 3 December 1998 biological opinion further identified the Gulf of Alaska region as critical to the survival and recovery of the western population of Steller sea lions and stated that the Gulf of Alaska pollock fishery as proposed will continue to be concentrated in time and space, and that it is not possible to determine whether the fishery is structured in a way that is likely to reduce the potential for localized pollock depletions, particularly during the critical winter period for the sea lions. The biological opinion therefore concluded that the Gulf of Alaska pollock fishery as proposed was likely to jeopardize the continued existence of Steller sea lions and adversely modify their critical habitat.

These three fisheries and their respective biological opinions are discussed in greater detail in the Commission's 1998 annual report.

Reasonable and Prudent Alternatives

The Service's 3 December 1998 biological opinion on the Bering Sea/Aleutian Islands groundfish fishery and Gulf of Alaska groundfish fishery included a framework for establishing reasonable and prudent alternatives to avoid jeopardizing the survival of the endangered western population of Steller sea lions or adversely modifying its critical habitat. This framework included three main principles and 14 guidelines. The principles were to protect the prey resources around rookeries and major haul-out sites and to spatially and temporally disperse the fisheries.

At its December 1998 meeting the North Pacific Fishery Management Council recommended several measures for emergency action by the Service in 1999. The total allowable catch allocations referenced below apply to the catch total after removing the 10 percent for community development quotas. For the

Bering Sea/Aleutian Islands region, the recommended actions included:

- closing the Aleutian Islands area to directed pollock fishing;
- partitioning the fishery into four seasons, beginning on 20 January ("A1" season), 20 February ("A2" season), 1 August ("B" season), and 15 September ("C" season), with no more than 30 percent of the total allowable catch coming from any one season;
- reducing the winter roe fishery to 40 percent of the total allowable catch;
- limiting the overall "A" season catch from sea lion critical habitat and the catcher vessel operation area to 62.5 percent of the total allowable catch for each of the four seasons; and
- expanding areas closed to trawling around rookeries and haul-out sites.

For the Gulf of Alaska, the actions recommended by the Council included:

- partitioning the fishery into four seasons, beginning on 20 January ("A" season), 1 June ("B" season), 1 September ("C" season), and no later than 1 October and no sooner than five days after closing the "C" season ("D" season);
- establishing catch limits of 30 percent of the total allowable catch for the "A" season, 20 percent for the "B" season, 25 percent for the "C" season, and 25 percent for the "D" season;
- establishing pollock trawl exclusion zones around Steller sea lion critical habitat and haul-out sites; and
- establishing a 136-metric ton (300,000-pound) trip limit for directed pollock fishing in the western and central management areas.

On 16 December 1998 the Service incorporated the Council's recommended measures, with some modification, into the reasonable and prudent alternatives for the fisheries for the first half of 1999.

On 22 January 1999 the Service published a final rule in the *Federal Register* covering the 1999 interim Atka mackerel fisheries, and a separate emergency rule for the 1999 pollock fisheries that was in effect until 19 June 1999. In June the Council made further recommendations for the later half of 1999 (under the

extended the emergency rule) and for 2000 and beyond (permanent rule).

Independent Review

The North Pacific Fishery Management Council, in consultation with the Marine Mammal Commission, the National Marine Fisheries Service, the Alaska Department of Fish and Game, and other relevant management agencies, commissioned a panel of knowledgeable experts to conduct an independent review of the scientific basis for the 3 December 1998 biological opinion. The review, held on 26-28 April 1999, concurred with the biological opinion in that considering the uncertainties associated with the relationship between the pollock fisheries and the survival of Steller sea lions, the pollock fisheries could reasonably be expected to jeopardize the survival of Steller sea lions and adversely modify their critical habitat. Further, the review panel concluded that, although the reasonable and prudent alternatives identified in the biological opinion to reduce competition between the pollock fisheries and Steller sea lions were reasonable goals, it was not possible to know if the reasonable and prudent alternatives specified in the biological opinion would significantly promote recovery of the western stock of Steller sea lions. The panel therefore identified as high priority research involving the Service, the North Pacific Fishery Management Council, and other stakeholders to determine the extent of competition between Steller sea lions and fisheries and to monitor the effects of the reasonable and prudent alternatives.

Litigation

On 15 April 1998 Greenpeace, the American Oceans Campaign, and the Sierra Club filed suit against the National Marine Fisheries Service in the district court for the Western District of Washington challenging the Service's management of groundfish fisheries in Alaska (*Greenpeace et al. v. NMFS*). The plaintiffs alleged that the Service had violated section 7 of the Endangered Species Act because its biological opinions on the fisheries did not adequately evaluate the effects of the fisheries on Steller sea lions and their critical habitat. The plaintiffs also claimed that the Service had violated the National Environmental

Policy Act by failing to supplement its environmental impact statements despite significant changes in the fisheries and the environmental baseline and by concluding in an environmental assessment that the 1998 fisheries would not have a significant impact on the environment. Shortly after the suit was filed, several fishing industry groups and Alaska coastal communities intervened on behalf of the Service (defendant-intervenors) as parties in the case.

The plaintiffs never sought to enjoin the 1998 fishing operations, but filed a motion for summary judgment on 8 August 1998 claiming that the alleged violations would be relevant to the 1999 pollock fishery. The government responded by seeking a stay of the litigation, noting that the Service was in the process of preparing a biological opinion and an environmental impact statement that would be applicable to the fisheries in 1999. The court granted the government's request and stayed the litigation until 16 December 1998, at which time the Service was expected to have completed its review of the fisheries under the National Environmental Policy Act and to have produced a biological opinion evaluating the effects of the pollock and Atka mackerel fisheries on Steller sea lions and their critical habitat. The proceeding action resulted in the 3 December 1998 biological opinion, described above.

The 3 December 1998 biological opinion as modified on 16 December) was challenged in the district court for the Western District of Washington. Plaintiffs in the case were as before, *i.e.*, Greenpeace, the American Oceans Campaign, and the Sierra Club. Intervenors were the Aleutians East Borough; Westward Seafoods, Inc.; Wards Cove Packaging Company; North Pacific Processors, Inc.; Nelbro Packaging Company; Unisea, Inc.; Peter Pan Seafoods, Inc.; Kodiak Salmon Packers, Inc.; Alyeska Seafoods Inc.; Western Alaska Fisheries, Inc.; Kanaway Seafoods, Inc.; Royal Viking, Inc.; Morning Star LP; Great Pacific Limited Partnership; Alaskan Command Company; Pacific Knight LLC; the city of Unialaska; United Catcher Boats; and At-Sea Processors Assn.

At a status conference held on 18 December 1998 the judge considered the parties' plans for the remainder of the litigation and gave the parties until 31 December to file additional claims. In response, the

plaintiffs filed an amended complaint setting forth four causes of action. They claimed that the supplemental environmental impact statement published by the Service was inadequate. They also argued that the biological opinion was flawed because the reasonable and prudent alternatives did not ensure that the pollock trawl fisheries in the Gulf of Alaska and in the Bering Sea would not jeopardize the continued existence of Steller sea lions or adversely modify critical habitat. The plaintiffs also contested the Service's conclusion that the Atka mackerel trawl fishery is not likely to jeopardize Steller sea lions or adversely modify Steller sea lion critical habitat.

The defendant-intervenors in this case filed cross claims challenging the Service's actions. Although there are slight differences among the filings of the groups comprising the defendant-intervenors, they essentially made similar claims. They believed that the Service acted arbitrarily by making a jeopardy finding in the 3 December 1998 biological opinion. Their filings noted that all the previous biological opinions had been "no jeopardy" determinations and that there was no new scientific information contained in the most recent biological opinion that warranted a different outcome. Likewise, they did not believe there to be an adequate basis for the Service's determination that the pollock fisheries are likely to adversely modify Steller sea lion critical habitat. Citing the regulatory requirement that reasonable and prudent alternatives be economically and technologically feasible, the intervenors argued that the Service had failed to assess the feasibility of implementing the alternatives set forth in the biological opinion. It was also argued that the biological opinion failed to consider changes in fishing practices that resulted from enactment of the American Fisheries Act.

On 13 May 1999 the court heard arguments on these motions and on 8 July submitted a judgment that granted in part and denied in part the motions of the plaintiffs, defendants, and intervenors. The court found the jeopardy determinations in the 3 December biological opinion to be reasonable, given the provisions of the Endangered Species Act, but also ruled that (1) the reasonable and prudent alternatives identified by the Service were arbitrary and capricious in that the biological opinion provided no explanation as to why the Service believed that they would accom-

plish the goal of avoiding jeopardy and adverse habitat modification; and (2) the National Environmental Policy Act requires preparation of a supplemental environmental impact statement that assesses the possible cumulative effects of the fishery management plans as a whole, not simply alternative total allowable catches.

In addition to its 3 December 1998 biological opinion on the pollock and Atka mackerel fisheries, on 22 December 1998 the Service completed a biological opinion on authorization of the Bering Sea/Aleutian Islands groundfish fisheries and Gulf of Alaska groundfish fisheries total allowable catch specifications for 1999, and concluded that they were not likely to jeopardize the continued existence of the endangered western population or threatened eastern population of Steller sea lions, or destroy or adversely modify designated critical habitat. This opinion, effective until the end of 1999, was contingent upon the development and implementation of a reasonable and prudent alternative to avoid jeopardy and adverse modification as given in the 3 December 1998 biological opinion. The plaintiffs filed a claim challenging this conclusion. As of 31 December 1999 the court had not submitted a judgment on this case.

On 22 December 1999 the Service completed a biological opinion on (1) authorization of the Bering Sea/Aleutian Islands groundfish fisheries based on total allowable catch specifications recommended by the North Pacific Fishery Management Council for 2000, (2) authorization of the Gulf of Alaska groundfish fisheries based on recommended total allowable catch specifications, and (3) measures to implement the American Fisheries Act. The opinion concluded that the three actions as proposed are not likely to jeopardize the continued existence of the six protected large whale species (northern right whale, blue whale, fin whale, sei whale, humpback whale, and sperm whale) or the eastern or western populations of Steller sea lions, or destroy or adversely modify designated Steller sea lion critical habitat.

Although these conclusions were based on the best scientific and commercial data available at the time, the Service recognized uncertainties in these data with respect to potential competition between the western population of Steller sea lions and the Bering

Sea/Aleutian Islands and Gulf of Alaska fisheries for Pacific cod. The Service therefore has identified crucial information necessary to address the question of competition. At the completion of those studies, expected to take one year, the issue of competition between Steller sea lions and the Bering Sea/Aleutian Islands and Gulf of Alaska cod fisheries should be re-examined.

Steller Sea Lion Recovery Team and Recovery Plan

The Steller Sea Lion Recovery Team last met in January 1999 with the objective of reviewing recent events related to management of the Alaska groundfish fisheries and the 3 December 1998 biological opinion. In February 1999 two workshops were convened by the Steller Sea Lion Recovery Team to evaluate progress in research on Steller sea lion physiology and feeding ecology. The two workshops, together with two additional workshops in December 1997 on behavior and telemetry, were intended to facilitate the revision of the Steller Sea Lion Recovery Plan, first completed in 1992. Revision of the plan will be the team's top priority when it is reconvened in the spring of 2000.

The Steller sea lion decline was one of the principal items on the agenda at the Marine Mammal Commission's annual meeting held 19-21 October 1999. Following the meeting, the Commission, in consultation with its Committee of Scientific Advisors, wrote to the National Marine Fisheries Service. In its letter dated 23 November 1999 the Commission recommended that a broadly based group of representatives of agencies and organizations with related interests and responsibilities, chaired by the Service, be established to develop and oversee an implementation plan for research identified in the updated recovery plan, thus assuring that the priority tasks are properly addressed. In this way, resources will first be applied to activities with the greatest potential to answer the biological and socioeconomic questions of greatest relevance to Steller sea lion conservation.

The Commission also noted that it was not clear whether the Service had the ship support necessary to assess fishery-caused changes in the species and

abundance of important Steller sea lion prey species in presumed critical feeding areas. The Commission recommended that, if lack of ship support is hampering efforts to assess the effects of fishery management practices on key sea lion prey species, the Service ask the affected fisheries to provide a dedicated vessel for sufficient time (e.g., 2 to 3 years) to conduct the necessary surveys. The Service had not responded to the letter by 31 December 1999.

Steller Sea Lion Subsistence Harvests

Steller sea lions have been hunted by Alaska Natives for subsistence purposes for centuries, but little is known of historic harvest levels. In 1992 the National Marine Fisheries Service contracted with the Alaska Department of Fish and Game to gather data on the annual subsistence harvest of Steller sea lions and harbor seals in Alaska. A system was established by which Native hunters from about 2,100 households in 60 coastal villages within the species' range are interviewed annually. At least 40 of the communities are located within the range of the western stock of Steller sea lions.

Survey results show a decline in total Steller sea lion subsistence take from about 549 sea lions in 1992 to about 178 in 1998. These figures include those struck and lost as well as those harvested. Analyses of the 1996 data indicate that 186 Steller sea lions were taken, of which 152 were harvested and 34 were struck and lost. In 1997, 146 animals were reported harvested, and 18 were struck and lost. For 1998, 131 were harvested, and 47 were struck and lost. As of 31 December, estimates of the 1999 Native subsistence harvest were not yet available.

As noted in the previous annual report, the Service has met with Native hunters to discuss the development of a co-management agreement for the subsistence harvest of Steller sea lions. A draft co-management agreement has been prepared between the National Marine Fisheries Service and the tribal government of St. Paul Island that would cover both Steller sea lions and northern fur seals. The draft plan calls for the establishment of a six-member co-management council, composed of three representatives from the Service and three from the tribal authority. The council would develop annual manage-

ment plans, recommend and consider monitoring and research programs, and provide for local decision-making on the harvest, including which rookery to harvest, numbers allowed to be taken, and the timing of the harvest. The agreement also would create a position for a tribal ecosystem officer whose responsibilities would include overseeing the harvest to ensure that it is both humane and efficient. The draft calls for a Steller sea lion biosampling program to be established under the agreement, which also would involve the tribal ecosystem officer. As of 31 December 1999 the agreement had not been finalized.

Pacific Walrus

(Odobenus rosmarus divergens)

The Pacific walrus is a subspecies of walrus that inhabits waters over the continental shelf of the Bering and Chukchi Seas off Alaska and eastern Russia (Fig. 7). Although most animals undertake north-south migrations following the seasonal advance and retreat of the pack ice on which they haul out, some Pacific walruses (mostly adult males) do not follow the pack ice northward and instead rest and molt at land-based haul-out sites in Alaska and Chukotka, Russia, during non-winter months. Four of these land-based haul-out sites are in Bristol Bay in the southeastern Bering Sea (Round Island, Cape Peirce, Cape Newenham, and Cape Seniavin).

For Native residents of coastal villages in both Alaska and Russia, Pacific walruses are essential cultural and subsistence resources. The annual walrus hunts, which are themselves an important means of maintaining Native cultural traditions, provide food, ivory, and other raw materials basic to Native lifestyles. The ivory from walrus tusks is used to make carvings that are an important source of income for Native villagers.

Although Pacific walruses have been subject to subsistence harvests by Native people for thousands of years, significant effects of human hunting on the walrus population did not occur until a series of commercial harvesting episodes began late in the 1860s by U.S. and Soviet hunters seeking ivory, oil, and hides. The last, and one of the most intense,

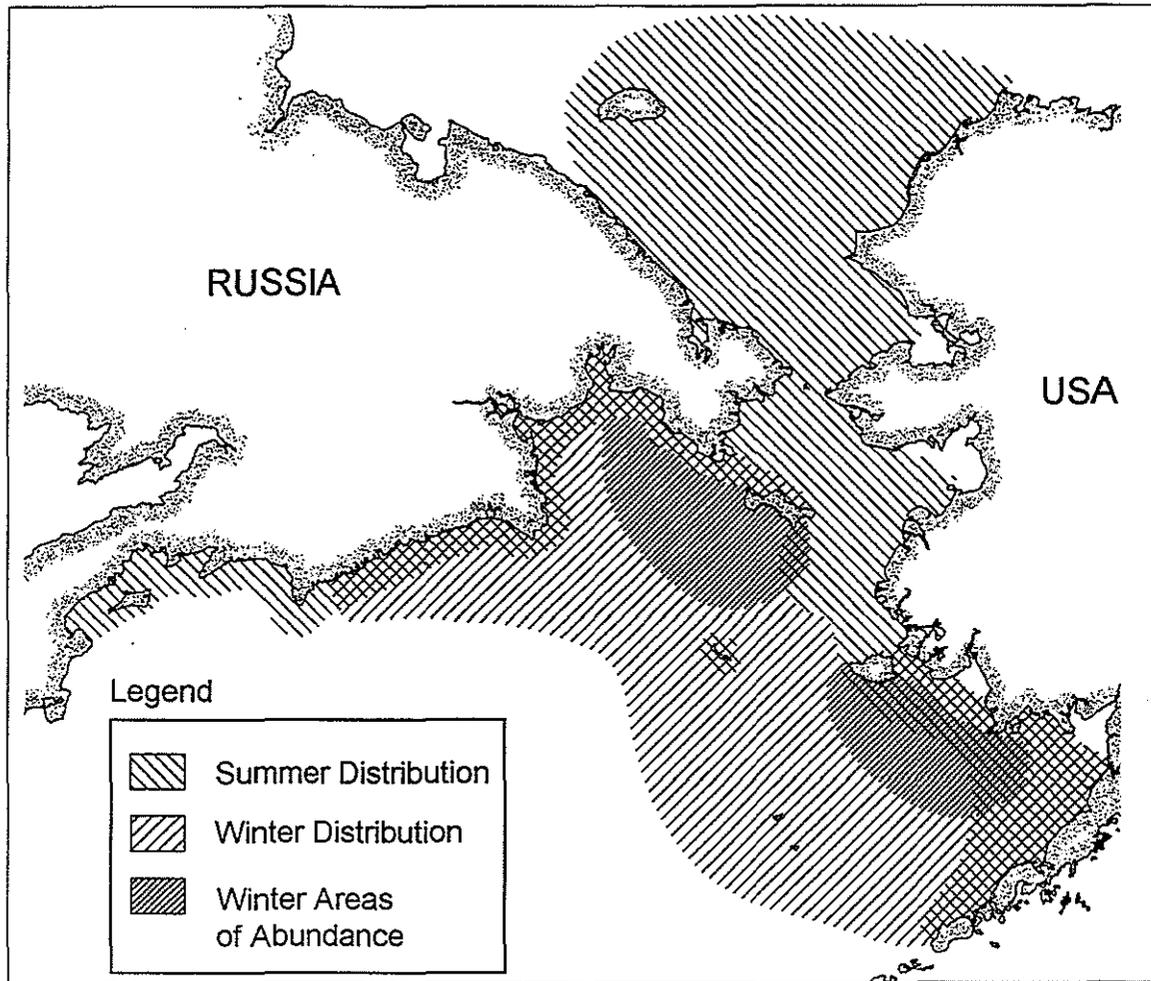


Figure 7. Range of the Pacific walrus.

commercial harvesting episodes occurred between the 1930s and early 1950s. By the mid-1950s, the population was thought to have been reduced to perhaps 50,000 to 100,000 walrus. Under conservation measures initiated independently by the former Soviet Union and the State of Alaska in the 1960s, the population rebounded. Based on results of a range-wide survey conducted jointly by U.S. and Russian scientists in 1990, the size of the Pacific walrus population was estimated to be at least 188,316 animals, and probably more than 200,000 animals. This estimate, possibly within the range of abundance levels that occurred before commercial hunting, is considered to be within the population's optimum sustainable population range.

The current status of the Pacific walrus, however, is uncertain. The most recent rangewide survey, done in 1990, is now badly out of date and surveys conducted from 1975 to 1990 produced population estimates with wide confidence intervals that severely limit their reliability. The results of alternative techniques to assess population status and trends (*e.g.*, blubber thickness and reproduction rates) are difficult to interpret without a reliable means of correlating the findings with information on changes in population size. This situation, along with reports in recent years by Native hunters and scientists that calf production and survival may be low, has led to increased concern for the population's status among both Natives and government managers.

The Fish and Wildlife Service is the lead federal agency responsible for conserving Pacific walruses under the Marine Mammal Protection Act. Pursuant to a cooperative agreement signed in 1997 with the Eskimo Walrus Commission (a Native organization established in 1978 to help conserve the walrus population), the Service works with Native communities and Native hunters to manage and monitor the subsistence hunt of walruses and to collect biological samples for walrus research. In addition, the Biological Resources Division of the U.S. Geological Survey conducts research on walruses in support of the walrus conservation program. To help guide walrus research and management actions, the Service adopted a Pacific Walrus Conservation Plan in 1994. As discussed in previous annual reports, this plan was prepared following recommendations by the Marine Mammal Commission with assistance from both the Commission and the Alaska Native community.

Subsistence Harvests of Pacific Walruses

The Marine Mammal Protection Act includes provisions to preserve traditional marine mammal hunting rights of Alaska Natives. Under the Act, Alaska Natives may continue to hunt walruses and other marine mammals, provided that the take is for purposes of subsistence or the creation of handicrafts and is not wasteful. As required by the Marine Mammal Protection Act, the Fish and Wildlife Service has calculated a potential biological removal level for the Pacific walrus of 7,533 walruses per year. The potential biological removal level is calculated using a formula designed to estimate the number of animals that can be removed annually from a given marine mammal stock (not including natural mortality), while maintaining a high degree of assurance that the stock will remain at, or increase toward, its optimum sustainable population size.

To estimate the number of walruses taken in Alaska, the Service, the Eskimo Walrus Commission, and Alaska Native hunters have cooperatively carried out an annual walrus harvest monitoring program since 1980 (except 1991 and 1992 when program funding was not available). Under this program, personnel are placed in four major walrus hunting villages (Gambell and Savoonga on St. Lawrence Island, Diomedé on Little Diomedé Island in th

Bering Strait, and Wales on the tip of the Seward Peninsula on the Alaska mainland) to record catch data and collect biological samples for research. Village monitors meet boats returning from walrus hunts and attempt to record data on every walrus taken during the monitoring period. From those data, statewide catch estimates are extrapolated. Past hunting records indicate that residents of the four villages typically harvest about three-fourths of all walruses taken in Alaska. The Service, the Eskimo Walrus Commission, and the Qayassiq Walrus Commission (an organization representing Native walrus hunters in northern Bristol Bay) also have monitored harvests at Round Island in northern Bristol Bay since 1995, when a limited walrus harvest resumed at that location after a 35-year hiatus.

In 1988 the Service, in cooperation with the Native community, also began a marine mammal marking, tagging, and reporting program to help improve data on Native harvest levels, and to help control trade in certain walrus, sea otter, and polar bear parts. Under this program certain marine mammal parts, such as walrus tusks, must be presented for tagging no more than 30 days after an animal is taken. Taggers, usually village residents hired and trained for this purpose, are located in more than 100 coastal villages. Because of the possibility that some animals, especially calves or other animals lacking tusks, may not be reported to taggers, annual walrus tagging totals were believed to be lower than actual take level by some unknown amount.

In 1998 the Service undertook a preliminary study to compare data collected under the two programs in order to refine methods for estimating statewide walrus harvest levels. The results indicated that walrus catch levels reported through the marking and tagging program varied from village to village, with some villages reporting virtually all landings and others reporting as low as 63 percent. Expanding on this work, Service scientists developed a new method of estimating walrus harvest levels in Alaska using data from both programs. Based on this approach, annual catch levels by Alaska Natives are estimated to have ranged from 1,003 to 2,501 walruses between 1992 and 1998 (see Table 5). This is well below catch levels for the 1980s when harvests consistently ranged from about 2,500 to 5,000 walruses per year.

Although complete information for estimating the 1999 catch level for Alaska was not available at the end of 1999, preliminary analyses suggest that the 1999 total catch is likely to be about 2,500 animals.

Walrus hunting also occurs in Russia. Since 1992 walrus hunting has been limited to Native people in Chukotka, Russia, where catch levels have been tracked under a harvest monitoring program administered by the Fishery Department in the Russian Federation's Agricultural Ministry. Although a Fisheries Department harvest quota of 3,000 animals has been in effect in recent years, reported catch levels have been far below the quota. As shown in Table 5, catch levels reported from 1992 to 1997 have ranged from at least 731 to 1,600 walrus per year. This is well below levels in the 1980s when both commercial and Native subsistence hunting occurred in Russia. Catch levels reported through the Russian monitoring program in the 1980s typically ranged from about 3,000 to 5,000 walrus per year.

Because of the economic situation in Russia, support for walrus monitoring work has been all but eliminated in recent years. As a result, no catch data are available for 1998, and reported levels for the preceding year are thought to be incomplete. To encourage continuation of the Russian program and to help standardize methods for collecting harvest data in both the United States and Russia, the Eskimo Walrus Commission and the Fish and Wildlife Service invited Russian officials and Native walrus hunters to a walrus harvest monitoring workshop in Nome, Alaska, in September 1998. The workshop provided a valuable opportunity to exchange views and information on walrus harvest monitoring efforts in both nations. Among other things, participants identified priority harvest monitoring needs and developed constructive recommendations. Results of the meeting were summarized in a workshop report completed by the Service and the Walrus Commission in 1999.

Based on discussions at the workshop, it was apparent that no funds would be available from the Russian government to continue its walrus harvest monitoring program. Recognizing the fundamental importance of obtaining catch data from Russia, as well as Alaska, workshop participants developed a proposal to replace the defunct Russian program.

Based on that proposal, the Fish and Wildlife Service, in cooperation with the Eskimo Walrus Commission, the State of Alaska, and the North Slope Borough, subsequently provided \$18,000 to help renew walrus harvest monitoring in Russia. The funds were used to (1) train Russian walrus harvest monitors in data collection methods used by U.S. walrus harvest monitors, and (2) pay for the collection of walrus catch data during 1999 in six major Russian villages where approximately 90 percent of the Russian walrus harvest occurred in recent years. As of the end of 1999 preliminary data reported by Russian monitors indicated that catch levels in the six villages totaled nearly 900 walrus. At the end of 1999 the Service was planning to continue funding the effort in 2000.

In addition to the walrus landed by Native hunters, some animals are shot but escape or sink before they can be retrieved. Because few live animals are seen with healed bullet wounds, it is thought that most walrus shot but lost soon die of their wounds. Data on such losses have not been collected recently; however, data collected between 1952 and 1972 suggest that 42 percent of the walrus shot during that period were not recovered. If that ratio is applied to recent U.S. and Russian catch data, and it is assumed that all animals shot and lost die, the total number of walrus killed in Native subsistence hunts in both Russia and Alaska between 1992 and 1998 would range from about 3,800 to 6,100 animals per year (see Table 5).

Pacific Walrus Research Activities

The Biological Resources Division of the U.S. Geological Survey is the principal agency responsible for research on Pacific walrus. The Fish and Wildlife Service and the Eskimo Walrus Commission, in cooperation with the Division, jointly determine research priorities. In some cases the Service and the Walrus Commission also assist with or provide direct support for some studies. Major walrus research activities during 1999 are discussed below.

Methods for Assessing Population Abundance — Probably the greatest problem facing the Pacific walrus conservation program is developing a reliable estimate of the total walrus population size and trends. The most recent estimates of population size are based

Table 5. Estimated catches of Pacific walruses in Alaska¹ and total reported catch of walruses in Russia, 1992-1998

<u>Year</u>	<u>Alaska</u>		<u>Russia</u>		<u>Total Catch</u>	<u>Total Catch Struck/Lost²</u>
	<u>Catch</u>	<u>Struck/Lost²</u>	<u>Catch</u>	<u>Struck/Lost²</u>		
1992	1,844	1,335	1,670	1,209	3,514	6,058
1993	1,385	1,003	856	620	2,241	3,864
1994	1,624	1,176	1,013	734	2,637	4,567
1995	1,692	1,225	1,071	776	2,763	4,764
1996	2,501	1,811	941	681	3,442	5,934
1997	1,672	1,211	731 ³	529	2,403 ³	4,143 ³
1998	1,747	1,265	—	—	—	—

¹ Estimates provided by Fish and Wildlife Service following methodology described in Garlich-Miller and D.M Burns. 1999. Estimating the harvest of Pacific walrus, *Odobenus rosmarus divergens*, in Alaska. Fish. Bull. 97(4):1043-1046.

² Based on a struck/lost ratio of 42 percent cited in F.H. Fay and C.E. Bowlby. 1994. The harvest of Pacific walrus, 1931-1989. Technical Report MMM 94.2. Fish and Wildlife Service, Anchorage, Alaska. 44 pp.

³ Because of funding cutbacks in the Russian walrus harvest monitoring program, this estimate is considered incomplete.

on a series of rangewide aerial and shipboard surveys in remote areas of the Bering and Chukchi Seas in summer when walruses occur along the edge of the pack ice and on coastal haul-out sites. Conducted jointly by U.S. and Russian researchers at five-year intervals, rangewide surveys were undertaken between 1975 and 1990. No surveys have been conducted since 1990, in part because of their expense and severe economic constraints on the responsible agencies, particularly those in Russia, where no funds are currently available for such work. A comparable survey today could cost \$1.5 million. In addition, sampling problems due to the patchy distribution of walruses over large areas have caused population estimates from past rangewide surveys to be imprecise and of limited value for detecting population trends.

To develop a more reliable approach for assessing population size and trends, the Fish and Wildlife Service and the U.S. Geological Survey took steps in 1999 to plan a walrus population survey workshop. Scheduled for late March 2000, the workshop is being organized to identify potentially viable survey approaches for estimating the size of the Pacific walrus population and the critical information needs and assumptions associated with each approach. Also to be discussed will be approaches for developing indices

of population size. Participants in the workshop will include marine mammal biologists familiar with population survey methods and past walrus surveys, representatives of the Native community, and others.

Monitoring Haul-Out Sites in Bristol Bay — As noted above, a segment of the Pacific walrus population, mostly adult males, remains year-round in the southeastern Bering Sea and Bristol Bay, where four land-based haul-out sites are used during summer. To monitor the status of this population segment, the Service, the Togiak National Wildlife Refuge, the State of Alaska, and the Bristol Bay Native Association have cooperatively monitored summer haul-out patterns at three sites (Round Island, Cape Peirce, and Cape Newenham) in northern Bristol Bay. In 1997 maximum counts at these haul-out sites revealed that at least 9,400 walruses were using Bristol Bay that year. To improve assessments of the number of walruses using Bristol Bay in summer, the Service also began monitoring walruses at the fourth Bristol Bay haul-out site in 1998, Cape Seniavin on the south shore of Bristol Bay. Based on maximum one-day counts at all four haul-out sites, at least 6,650 and 5,788 walruses were known to use Bristol Bay during the summers of 1998 and 1999, respectively.

Although maximum one-day counts at all four sites provide a minimum number of walrus using Bristol Bay, the figure does not account for the number of walrus away from the beach when counts are made. Variability in the proportion of animals at sea at any given time, and in the use of different haul-out sites in the Bay by individual walrus, limits the usefulness of maximum one-day counts for detecting abundance trends from year to year. To provide a more reliable measure of abundance trends, in 1998 researchers with the U.S. Geological Survey examined alternative methods to account for temporal variability in the proportion of walrus hauled out at monitored sites. Results of the analysis, which focused on counts at Cape Peirce, were published in 1999. They suggested that an index based on mean annual counts at the various sites will provide a more reliable way of detecting abundance changes between years. Therefore, in 2000 researchers plan to apply the new approach to counts at all four sites in Bristol Bay.

Telemetry Studies — In 1995 the U.S. Geological Survey initiated a multiyear satellite tracking study to improve information on at-sea habitat-use patterns of walrus. For four years, satellite transmitters were successfully attached to the tusks of walrus in the Bristol Bay area, and animals were tracked for periods of over one year. Among other things, the results provided important information on haul-out patterns and identified foraging areas in Bristol Bay.

Because adult walrus can weigh more than 1,600 kg (3,600 lb), drugs are required to immobilize animals for tagging. Reliable techniques for immobilizing walrus, however, have proven difficult to perfect. During tagging work to date, some anesthetized animals have died. As a result, the tagging program has been curtailed pending work to develop safer, more reliable immobilization techniques. In 1999 anesthesiologists focused on experimenting with various combinations of drugs and using oxygen ventilators to minimize immobilization-related deaths. The work is expected to continue in 2000.

Assessing Age-Sex Composition and Reproduction — The age and sex of walrus can be determined by morphological differences in tusks and facial

features. By careful observation of such features, animals younger than five years old can be classified into specific age groups, and older animals can be assigned to multiyear age categories. Initial studies in the 1980s using such characteristics revealed that about one-third of the population's mature females on summer feeding grounds were accompanied by calves of the year, and another third were accompanied by one-year-old walrus.

To help assess the status of the Pacific walrus population, researchers at the University of Alaska and the Fish and Wildlife Service began a new program in 1998 using this technique to assess the age and sex composition of the walrus population and the survivorship of young animals. With an ice-breaking vessel provided at no charge by Greenpeace, a 17-day survey cruise was made in August and September along the ice edge of the Chukchi Sea between Barrow, Alaska, and Wrangel Island, Russia, and along the coasts of the Chukotka Peninsula and northwestern Alaska. During observations of approximately 1,000 walrus, researchers found that only five percent of the females were accompanied by calves of the year, seven percent were accompanied by one-year-old calves, and six percent were accompanied by two-year-olds. Compared with earlier studies, the 1998 results suggest that either the number of births or the survival of young animals is now far lower than in the 1980s. Slightly higher, but still low, percentages were found during observations of nearly 1,400 animals during a July 1999 survey. Preliminary results of that survey indicate that 16, 9, and 15 percent of females were accompanied by calves of the year, one-year-olds, and two-year-olds, respectively.

Most walrus remain with their mothers two or three years after birth, and mature females typically give birth once every two or three years. Potential population growth rates for walrus are therefore low compared with most pinnipeds, which give birth annually. Findings from the above surveys, which support observations by Native hunters who have reported fewer calves among the herd in recent years, raise concern over recent population trends. Low reproductive rates and/or juvenile survival could be partly related to climatic changes.

U.S.-Russian Cooperative Agreements

Recognizing mutual interests in conserving marine mammal populations that range across the U.S. and Russian border, the Fish and Wildlife Service initiated steps after the collapse of the former Soviet Union to formalize cooperative arrangements for research and management activities on Pacific walruses, as well as polar bears. A protocol expressing mutual interest in negotiating a bilateral agreement on polar bears was signed in 1992 and a similar agreement was signed on Pacific walruses in 1994. Both protocols envisioned separate government-to-government and Native-to-Native agreements between respective counterparts in the two nations.

U.S. and Russian officials agreed to complete negotiations on the government-to-government polar bear agreement before proceeding to negotiate the walrus agreement. As noted in the following section on the polar bear, work on the polar bear agreement had not yet been completed as of the end of 1999. As a result, work on the walrus agreement was deferred in 1999. As soon as the polar bear agreement is

concluded, the Service plans to work closely with the Alaska Native community and other interested parties, including the Commission, to develop a U.S. negotiating position on the provisions for a U.S.-Russia walrus agreement.

Polar Bear (*Ursus maritimus*)

Polar bears are distributed throughout the Arctic region within the national boundaries of the United States, Canada, Greenland, Norway, and Russia, as well as in international waters. The species comprises several largely discrete stocks, two of which occur in Alaska — the western Alaska (Chukchi/Bering Seas) stock, shared with Russia, and the northern Alaska (southern Beaufort Sea) stock, shared with Canada. The total number of polar bears in Alaska and adjacent waters has been estimated at 2,000 to 5,000 animals. The worldwide population has been estimated at 21,000 to 28,000 animals.

Accurate estimates of the current and historic sizes of polar bear stocks are difficult to obtain for several reasons — the species' inaccessible habitat, the movement of bears across international boundaries, and the costs of conducting surveys. It is thought, however, that intense sport hunting prior to enactment of the Marine Mammal Protection Act may have reduced both the Chukchi/Bering Seas and the Beaufort Sea stocks. In September 1998 the Fish and Wildlife Service published stock assessments for these two stocks, suggesting that both have grown since passage of the Act.

Until the middle of the 20th century, polar bears in Alaska were taken primarily by Natives for subsistence purposes and for the sale of hides. Late in the 1940s trophy hunters using professional guides, and sometimes aircraft, began taking polar bears. As the size of the sport hunt grew, pressure on polar bear stocks in Alaska and elsewhere increased substantially. Recognizing this, in 1961 the State of Alaska adopted regulations restricting the sport-hunting season and requiring hunters to present all polar bear skins and skulls for tagging and examination. At the same time, preference was provided to subsistence hunters, and a prohibition was placed on shooting cubs and females with cubs. Between 1961 and 1972 an average of 260 polar bears was taken annually in Alaska, 75 percent of which were males. In 1972 the state banned hunting with the use of aircraft.

That same year, enactment of the Marine Mammal Protection Act placed a moratorium on the take of polar bears and other marine mammals, and management responsibility for these species was transferred to the federal government. Under the Act, Alaska Natives are allowed to take polar bears and other marine mammals for purposes of subsistence and 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 and the population is not depleted. The Act also prohibited the import of polar bear parts, such as hides, into the United States.

Because the ranges of many polar bear stocks cross national boundaries, efforts to protect and conserve polar bears require cooperation among the various

nations. Concern over the dramatic increase in polar bear harvest levels in the 1950s and 1960s led to negotiation of the international Agreement on the Conservation of Polar Bears. The Agreement was concluded in 1973 by the governments of Canada, Denmark (for Greenland), Norway, the Soviet Union, and the United States.

In 1994 Congress amended the Marine Mammal Protection Act, adding a number of measures related to polar bears. Among these was a provision allowing the issuance of permits to import sport-hunted polar bear trophies legally taken by U.S. citizens in Canada provided that the Fish and Wildlife Service, in consultation with the Marine Mammal Commission, made certain findings. Efforts by the Fish and Wildlife Service to promulgate regulations allowing imports from certain stocks and further amendments enacted in 1997 have been discussed in previous annual reports. The 1994 amendments also called on the Secretary of the Interior to initiate two reviews relative to the 1973 polar bear agreement. Activities in this regard, along with efforts to develop an agreement between the governments of the United States and Russia, are discussed below. Activities related to the take of polar bears and other marine mammals incidental to oil and gas development and exploration in the Arctic are discussed in Chapter X under "Small-Take Authorizations."

Polar Bear Stock Assessments

The 1994 amendments to the Marine Mammal Protection Act require the Fish and Wildlife Service and the National Marine Fisheries Service to prepare and periodically update stock assessment reports for each marine mammal stock in U.S. waters. Initial stock assessments for the two polar bear stocks in Alaska were published by the Fish and Wildlife Service in October 1995 and were updated in September 1998. In its latest assessments, the Service estimates the size of the Beaufort Sea polar bear stock at 1,765 (CV=0.10). However, no reliable stock estimate could be made for the Chukchi/Bering Seas stock in either 1995 or 1998.

At the Marine Mammal Commission's 19-21 October 1999 annual meeting, representatives of the Fish and Wildlife Service emphasized the pressing

need to obtain information about the Chukchi/Bering Seas stock, particularly in light of efforts to conclude a U.S.-Russian bilateral agreement, as discussed below. The Service noted that one method for obtaining needed information was to continue earlier work to survey polar bear dens for use as an index of abundance. The Service advised the Commission that it planned to meet with Russian colleagues early in 2000 to work out a protocol for den surveys. In addition, the Service expressed optimism that during 2000 researchers would be able to use a Coast Guard icebreaker or a similar vessel operating in the area as a platform of opportunity to conduct aerial surveys of polar bears in the Chukchi and Bering Seas.

New information is also needed to refine and update the Service's estimates for the Beaufort Sea polar bear stock. The data currently being used are about 10 years old, and the Fish and Wildlife Service hopes to work with Canadian scientists to carry out a systematic mark-recapture study to help assess the current status of that stock. At the October 1999 Commission meeting, Service representatives also provided information on work by the Biological Resources Division of the U.S. Geological Survey to radio-tag female polar bears in order to test the effectiveness of forward-looking infrared imagery as a means of detecting bears in their dens.

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 that the Fish and Wildlife Service prepare conservation plans for polar bears, walruses, and sea otters in Alaska. The Service agreed and, from 1992 through 1994, the Commission worked closely with the Service to ensure that the conservation plans identified research and management actions necessary to maintain populations in Alaska within their optimum sustainable population range, as required by the Act.

The final conservation plan for polar bears in Alaska, as well as the plans for walruses and sea

otters in Alaska, was issued by the Service in 1994. At that time, the Service noted that the plans would be reviewed annually with the idea of updating the plans, if necessary, in three to five years. It was the Commission's understanding that the Service intended to address the need to update the polar bear conservation plan during 1999. However, other responsibilities related to polar bear management issues prevented the Service from committing the necessary staff time and resources to this task. During 2000 the Service intends to review its conservation plans for polar bears and other Alaska marine mammal species and to revise the plans, as needed.

Co-Management Agreements

Section 119 of the Marine Mammal Protection Act, adopted as part of the 1994 amendments to the Act, provides explicit authority for establishing cooperative agreements between the Secretaries of Commerce and the Interior and Alaska Native organizations to conserve marine mammals and provide for co-management of subsistence uses by Alaska Natives. Under such agreements, the Secretaries may make grants to Native organizations for 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.

On 19 February 1997 the Fish and Wildlife Service and the Alaska Nanuuq (Polar Bear) Commission signed a cooperative agreement pursuant to section 119 for the co-management of polar bears. Under the agreement, the Service has provided to the Nanuuq Commission about \$90,000 in each of the past three years. Funds have been used primarily for operational expenses of the Nanuuq Commission and to support its involvement in efforts to conclude a bilateral agreement between the United States and Russia on conservation of polar bears in the Bering and Chukchi Seas (see below).

As a related effort, the Nanuuq Commission began a cooperative project in 1999 with the Union of Marine Mammal Hunters in Chukotka, Russia, to gather traditional ecological knowledge about polar bear habitat use in Chukotka. The project is modeled

after a similar project carried out by the Fish and Wildlife Service's Alaska Regional Office, which is providing technical assistance. Funding has been provided by the National Park Service.

Another co-management project involves the collection of polar bear samples from animals taken by subsistence hunters to assess contaminant levels. The polar bear has been selected as one of the indicator species to be monitored as part of the Arctic Monitoring and Assessment Program (see Chapter V).

When Congress adopted section 119 in 1994, it authorized annual appropriations of \$1.5 million and \$1 million to the Departments of Commerce and the Interior, respectively, to carry out its provisions during fiscal years 1994 through 1999. To date, funding provided for such agreements has been far below the authorized level and insufficient to fully implement all co-management agreements.

Marking, Tagging, and Reporting Program

As noted above, the Marine Mammal Protection Act allows Alaska Natives to take marine mammals for purposes of subsistence and for making and selling traditional handicrafts. Under amendments to the Act adopted in 1981, the Fish and Wildlife Service and the National Marine Fisheries Service have specific authority to establish marking, tagging, and reporting programs to monitor the Native harvests of marine mammals. The Fish and Wildlife Service established such programs for sea otters, walrus, and polar bears. The purposes of those programs are to estimate annual harvest levels, obtain biological data needed to manage the species and stocks, and help control illegal trade in products from those species.

Marking, tagging, and reporting 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 an authorized Service agent and present specified parts, including polar bear hides and skulls, to be marked and tagged. Since promulgating its regulations, the Service has worked closely with Native groups to implement the program. Data obtained from the program are maintained by the Service in a computerized database. During the

Table 6. Numbers of polar bears tagged during Alaska Native harvests, 1989-1999

<u>Harvest Year</u>	<u>Number Tagged</u>	<u>Harvest Year</u>	<u>Number Tagged</u>
1989/90	99	1994/95	92
1990/91	76	1995/96	38
1991/92	59	1996/97	68
1992/93	66	1997/98	49
1993/94	121	1998/99	92

Source: Fish and Wildlife Service

harvest year running from 1 July 1998 to 30 June 1999, 92 polar bears were presented for marking and tagging by Alaska Natives. The numbers of polar bears tagged during the past 10 harvest years are shown in Table 6.

Agreement on the Conservation of Polar Bears

As noted above, polar bears occur throughout the Arctic in relatively discrete stocks that overlap national boundaries. Thus, effective conservation of polar bears requires international cooperation. 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. The Agreement was prompted by growing concern about the possible effects of sport and commercial hunting of polar bears, which had increased in the 1950s and 1960s, and the potential effects of industrial activities.

The Marine Mammal Commission and others have questioned whether the Marine Mammal Protection Act or other domestic statutes provide sufficient legal authority for the United States to implement fully all provisions of the Agreement, particularly those related to habitat protection. Accordingly, in 1992 the Commission contracted for an examination of the Agreement's provisions, the Marine Mammal Protection Act, and other domestic legislation to identify possible inconsistencies and provide suggestions as to how inconsistent provisions of the Agreement and the Act might be reconciled. The

report of that study was provided to the Fish and Wildlife Service in January 1994 and was subsequently updated to reflect amendments to the Marine Mammal Protection Act enacted in 1994 (see Appendix B, Baur 1995).

In response to concerns that the Agreement may not have been implemented fully by the United States and other parties, Congress amended section 113 of the Marine Mammal Protection Act in 1994 to require the Secretary of the Interior to initiate a review of the effectiveness of the Agreement and to work with the contracting parties to establish a process by which future reviews of the Agreement would be conducted. The amendments also require that the Secretary of the Interior, in consultation with the Secretary of State and the Marine Mammal Commission, review the effectiveness of U.S. implementation of the Agreement, particularly with respect to habitat protection. A report on the results of that review was to be submitted to Congress by 1 April 1995.

In June 1995 the Service convened a meeting of representatives of interested governmental agencies and non-governmental organizations to review U.S. implementation of the Agreement. The Service subsequently prepared a draft report assessing U.S. compliance with each of the provisions of the Agreement and with a resolution adopted by the Parties to the Agreement concerning the taking of female bears, cubs, and denning bears. The Commission's comments on the draft report, transmitted to the Service on 5 July 1996, are discussed in previous annual reports. Also as noted previously, the Commission has, since 1997, anticipated the transmittal of the Service's final report to Congress. However, at the end of 1999, it was the Commission's understanding that the final report was still undergoing clearance within the Department of the Interior.

Section 113 of the Marine Mammal Protection Act also directs the Secretary of the Interior to consult with contracting parties to review the effectiveness of the Agreement on the Conservation of Polar Bears. In May 1997 the Fish and Wildlife Service wrote to the other parties seeking their assistance in conducting the review. As of the end of 1999 the Service had received final reviews from Canada, Norway, and Greenland. A preliminary response from the Russian

Federation, transmitted in 1998, has yet to be forwarded in final form. Although little detail is provided, the Russian response suggests that the agreement should be opened up for modification. Once all final responses are in hand, the Service intends to prepare a report on international compliance with the Agreement and the other parties' views as to what further review is needed.

Bilateral Polar Bear Agreements

As discussed above, two discrete polar bear stocks occur in Alaska, and both are shared with other countries. The northern (Beaufort Sea) stock is shared with Canada and the western (Chukchi/Bering Seas) stock is shared with Russia. Efforts to develop cooperative programs with these countries for the management and conservation of polar bears are discussed below.

North Slope Borough/Inuvialuit Polar Bear Agreement — Native hunters in both Alaska and northwestern Canada have traditionally hunted polar bears in the Beaufort Sea area. Because both groups were targeting polar bears from the same stock, unregulated hunting, by itself and in combination with other activities, could have caused the stock to decline. Recognizing this possibility, 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.

The agreement is more restrictive than the Marine Mammal Protection Act in that it calls for protecting cubs, females with cubs, and all bears inhabiting or constructing dens, and prohibits airborne hunting. Other provisions of the agreement prohibit hunting at certain times of the year and provide that a harvest quota, based on the best available scientific evidence, be established annually. Quotas are allocated equitably between Natives in Alaska and Canada, and data are collected and shared on the number, location, age, and sex of bears killed.

Although the agreement is not legally binding, both Alaska and Canadian Natives have largely com-

plied with the mutually agreed conservation measures and, after more than 10 years of history, the agreement is considered a model for cooperative, voluntary management of a resource. The subsistence harvest of Beaufort Sea polar bears has remained well below the calculated sustainable level, and the take of female bears and cubs has been reduced significantly.

U.S.-Russian Polar Bear Agreement — The western or Chukchi/Bering Seas polar bear stock, which ranges between Alaska and Russia, has traditionally been used for subsistence by Native people in both the United States and Russia. In 1992 the Fish and Wildlife Service's Alaska Regional Director and a representative of the Russian Ministry of Ecology and Natural Resources signed a protocol stating the parties' intentions to conclude a bilateral agreement on the conservation and regulated use of polar bears from the shared stock. The protocol called on both governments to create special working groups composed of representatives of government agencies and Native communities to prepare proposals for such an agreement and to convene a meeting of the working groups to prepare a draft agreement.

The 1994 amendments to the Marine Mammal Protection Act added a new section, section 113(d), which specifically addresses conservation of the shared U.S.-Russian polar bear stock. The provision directed the Secretary of the Interior, in consultation with the Commission and the State of Alaska, to consult with Russian officials on the development and implementation of enhanced cooperative research and management programs for the shared polar bear stock. In 1994 representatives of Native organizations and government agencies from the United States and Russia held technical discussions concerning joint conservation of the shared stock of polar bears occupying the Chukchi, Bering, and eastern Siberian Seas. As a result of those discussions, the parties signed the Protocol on U.S./Russia Technical Consultation for the Conservation of Polar Bears of the Chukchi/Bering Sea Regions on 9 September 1994. Further scientific and technical discussions concerning the proposed government-to-government agreement were held in Russia during 1995. Participants included both government officials and representatives of the affected Native communities. The U.S. delegation to

that meeting included a representative of the Marine Mammal Commission.

In July 1996 the Fish and Wildlife Service completed and solicited comments on its Draft Environmental Assessment on the Development of a U.S./Russia Bilateral Agreement for the Conservation of Polar Bears in the Chukchi/Bering Seas. The assessment identified as the preferred alternative the simultaneous development of a government-to-government agreement and a Native-to-Native agreement. The alternative called for undertaking joint efforts with respect to research and management, population and harvest monitoring, enforcement, and habitat protection. A key feature of the alternative was establishment of a joint commission, composed of government and Native representatives from each country, to set annual harvest limits and to oversee implementation of the agreement. The Commission's comments on the draft environmental assessment, provided to the Service on 20 December 1996, are discussed in previous annual reports.

The Service's final environmental assessment, published on 12 March 1997, concluded that the preferred alternative would have no significant environmental impact. Shortly thereafter, the Service prepared and transmitted to the Department of State a request for authority to negotiate the agreement. The request was granted early in 1998, and formal negotiations between U.S. and Russian officials were held 9–12 February 1998 at Orcas Island, Washington. A representative of the Marine Mammal Commission served as a member of the U.S. delegation.

The U.S.–Russian negotiations resulted in an *ad referendum* agreement on the text of a bilateral agreement for submission to the two national governments for approval. Among other things, the agreement recognizes that Native people in the United States and Russia share an equal interest in and responsibility for the conservation and sustainable use of the Chukchi/Bering Seas polar bear stock.

The text provides that Native people of Alaska and Chukotka may take polar bears for subsistence purposes, provided that the take is consistent with Article III(1)(d) of the 1973 Agreement on the Conservation of Polar Bears, which allows taking “by

local people using traditional methods in the exercise of their traditional rights....” In addition, the agreed text bans the taking of females with cubs, cubs less than one year old, and bears in dens; the use of aircraft and large motorized vessels and vehicles to hunt polar bears; and the use of poisons, traps, and snares.

The text also recognizes the importance of ensuring the full involvement of Natives in the implementation and enforcement of its provisions. Toward this end, it calls for establishing a U.S.–Russian Polar Bear Commission, to be composed of a U.S. section and a Russian section. Each section would have two appointed commissioners, and all decisions and recommendations of the commission would require the approval of both sections. The proposed responsibilities of the joint commission are discussed in the previous annual report.

The text of the joint polar bear agreement was submitted to the governments of the United States and the Russian Federation for approval. The U.S. Department of State reviewed the text and forwarded it to the Russian Federation with minor changes. However, political changes occurring in Russia during 1998 prevented a prompt review of the agreed text in that country. In July 1999 the Russian Federation forwarded to the U.S. Department of State and the Department of the Interior proposed revisions to the text. Following review of the Russian revisions, the U.S. Department of State and the Department of the Interior wrote jointly to the head of the Russian State Committee for Environmental Protection on 8 December 1999. In the letter, the Departments conveyed the United States' view that some modifications proposed by the Russians reflected a significant departure from the principles worked out at the February 1998 meeting. The letter stated that, although some of the technical revisions proposed by the Russians were agreeable, others were not acceptable to the United States. To facilitate further negotiation, the U.S. comments were attached and incorporated into a new version of the bilateral polar bear text, which was also forwarded to the Russian State Committee.

The U.S. and Russian delegations negotiating the bilateral agreement are expected to meet early in 2000 to resolve differences between the revised texts. Once

this occurs, the U.S. State Department, as required by the Agreement on the Conservation of Polar Bears, will enter into consultations with the other parties. Based on these consultations, it will then forward the bilateral U.S.–Russian agreement to the Senate for its advice and consent and consideration of implementing legislation.

Polar Bear Trophy Imports

In 1994 the Marine Mammal Protection Act was amended to allow the Secretary of the Interior to issue permits to import sport-hunted polar bear trophies from Canada, provided that certain findings are made. Among other things, it must be found that Canada has an enforced sport-hunting program consistent with the purposes of the Agreement on the Conservation of Polar Bears and based on scientifically sound quotas that will ensure the maintenance of the affected population stock at a sustainable level. The amendments also direct the Secretary to charge a reasonable fee for permits, and to use the receipts to develop cooperative research and management programs for the conservation of polar bears in Alaska and Russia.

Regulations to implement the polar bear import provision were published in proposed form by the Fish and Wildlife Service in January 1995; a supplemental proposed rule addressing the required legal and scientific findings was published in July 1995.

Comments on the proposed rule by the Marine Mammal Commission and others prompted the Service to seek additional information from Canada on the status and management of polar bears. After reviewing this information, the Service published a final rule on 18 February 1997, finding that 5 of 12 Canadian polar bear management units met the U.S. legal criteria for the import of polar bear parts. The management units from which imports were authorized include the southern Beaufort Sea, the northern Beaufort Sea, Viscount Melville Sound, western Hudson Bay, and M'Clintock Channel. A key feature of the final rule was establishment of a \$1,000 permit issuance fee, in addition to a \$25 processing fee, to be used for polar bear conservation activities.

Upon publication, the rule was attacked both by groups that supported and those that opposed the

measure. Hunting groups and some members of Congress believed that the Service had interpreted the 1994 amendments too narrowly and, as a result, had not authorized imports from all of the populations they believed met the statutory criteria. On the other hand, animal welfare groups believed that the Service had erred by making affirmative findings for any of the management units. Both sides threatened to file suit challenging the regulations.

As discussed in the two previous annual reports, the House Resources Committee convened a hearing early in 1997 to review the Service's implementation of the polar bear import provisions. That hearing led to an amendment to the Marine Mammal Protection Act to allow imports of all polar bear trophies legally taken in Canada before 30 April 1994.

Shortly after publication of the final regulations in February 1997, the Commission requested and received from the Service additional information on Canada's polar bear program. Among other things, Canada had revised the boundaries of some polar bear management units. What previously had comprised three management units (Queen Elizabeth Islands, Parry Channel, and Baffin Bay) had been realigned into smaller Baffin Bay and Queen Elizabeth Islands units and three new management units (Kane Basin, Lancaster Sound, and Norwegian Bay). In light of the new information, the Commission contracted with a biometrician to review and evaluate Canada's polar bear management program, particularly as it relates to the current status and sustainability of those populations for which the Fish and Wildlife Service deferred making findings under the final rule. A final contract report was submitted to the Commission on 21 April 1997 (see Appendix B, Testa 1997). The report concluded that the Canadian polar bear program is consistent with generally accepted principles of sound resource management. The report also concluded that available data supported Canada's realignment of the Queen Elizabeth Islands, Parry Channel, and Baffin Bay management units.

Based on analyses in the contract report and its independent review of the available data, the Commission wrote to the Fish and Wildlife Service on 22 April 1997, providing a copy of the contract report and noting that it appeared that the Lancaster Sound

and Norwegian Bay management units had management programs in place that satisfy the Marine Mammal Protection Act's import requirements. The Commission therefore recommended that the Service, if it concurred with that conclusion, initiate a rule-making to make affirmative findings for these two management units.

The Fish and Wildlife Service published a proposed rule on 2 February 1998 to make affirmative findings for the Lancaster Sound and Norwegian Bay management units. The Commission provided comments by letter of 1 April 1998, supporting the proposed findings. The Commission nevertheless recommended that the Service closely track implementation of a new system for setting harvest quotas being implemented by Canada to ensure that it works as expected and continues to meet the Marine Mammal Protection Act's requirements.

On 11 January 1999 the Service published a final rule allowing the import of polar bear trophies from the Lancaster Sound and Norwegian Bay management units. Approval of the Baffin Bay and Kane Basin populations was deferred pending the establishment of cooperative management arrangements between Canada and Greenland. The Service also deferred making a finding on the revised Queen Elizabeth Islands population that now contains land only in the far-northern part of the Canadian Arctic archipelago.

Under the 1994 amendments to the Marine Mammal Protection Act, the Fish and Wildlife Service was directed to undertake a scientific review of the impact of issuing import permits on the polar bear populations in Canada. The review was to be completed by 30 April 1996. No permits could be issued after 30 September 1996 if the review indicated that issuing such permits would have a significant adverse effect on Canadian polar bear stocks. Because the regulations authorizing imports had not been issued by the time the review was to be completed, no review was undertaken. Instead, the regulations published by the Service on 18 February 1997 specified that the review would be undertaken within two years of 20 March 1997. As of the end of 1999, however, the Commission had not been advised of the status of results of the Service's review.

As of the end of 1998 the Service had issued 183 permits authorizing the import of polar bear trophies from Canada. As of the end of 1999 the Service had issued an additional 143 permits.

Sea Otter (*Enhydra lutris*)

Historically sea otters inhabited the coastal waters of the North Pacific Ocean from Hokkaido in northern Japan, north and east through the Kurile Islands, Kamchatka Peninsula, the Commander and Aleutian Islands, and Gulf of Alaska, and south along the west coast of Canada and the United States to Baja California, Mexico. Three subspecies are recognized: *E. lutris lutris*, *E. lutris nereis*, and *E. lutris kenyoni*.

Commercial hunting of sea otters began in 1741 with the Russian discovery of Alaska and continued without regulation for more than 150 years. The species' worldwide population before commercial exploitation is estimated to have been from 150,000 to 300,000 animals. By 1911, when sea otter hunting was prohibited under the terms of the North Pacific Fur Seal Convention, signed by the United States, Russia, Great Britain, and Japan, the total population had been reduced to a few thousand animals in 13 remote, widely scattered locations. In California, for example, as few as 50 otters may have survived along the isolated Big Sur coast.

Since protection was provided in 1911, sea otters have recolonized or have been reintroduced into much of their historic range in Russia and Alaska, and parts of their range in British Columbia, Washington, and California. In the last 20 years, however, new threats have developed. They include oil spills from tanker accidents and offshore oil and gas exploration and development, entanglement in fishing gear, chemical pollution, and possible new and unusual diseases.

Efforts by the Marine Mammal Commission and others to protect sea otters and their habitat since the Marine Mammal Protection Act was passed in 1972 have been described in previous annual reports. A summary of those actions and a description of efforts undertaken in 1999 follows.

Southern Sea Otter Recovery Plan adopted in February 1982. At that time, the Marine Mammal Protection Act contained no provisions for authorizing the take of endangered, threatened, or depleted species of marine mammals for purposes other than scientific research. To enable implementation of the recovery plan, Congress in 1986 enacted Public Law 99-625 authorizing the capture and translocation of sea otters to establish at least one colony outside the then-existing sea otter range in California. The law required that the Fish and Wildlife Service develop a translocation plan that specified a translocation zone that would meet the habitat needs of the translocated otters and provide a buffer from the possible adverse effects of activities that may occur outside the zone (see Fig. 9). The law also required that the plan specify a management zone, surrounding the translocation zone, from which otters were to be excluded using feasible, non-lethal means. Animals within the translocation zone were to be subject to all applicable provisions of the Endangered Species Act and Marine Mammal Protection Act; animals in the management zone were to be provided fewer legal protections.

Based on information gathered during the mapping study noted earlier, the Fish and Wildlife Service determined that San Nicolas Island, one of the California Channel Islands offshore Los Angeles, would be the best place to establish a reserve sea otter colony. The Service, in consultation with the Marine Mammal Commission, the California Coastal Commission, and the California Department of Fish and Game, subsequently developed a plan and promulgated regulations to establish a reserve sea otter colony at San Nicolas Island. In August 1987 the Service and the California Department of Fish and Game signed a memorandum of understanding regarding the translocation and related studies.

The Translocation — Between August 1987 and July 1990, 139 sea otters were captured along the California coast and moved to San Nicolas Island. Most of the animals subsequently left the area or disappeared: 36 returned to the mainland range and 11 were captured in the management zone and returned to the mainland range. A few remained at San Nicolas Island and, although 50 pups are known to have been born there, the colony has not grown, and on average has numbered fewer than 20 individuals.

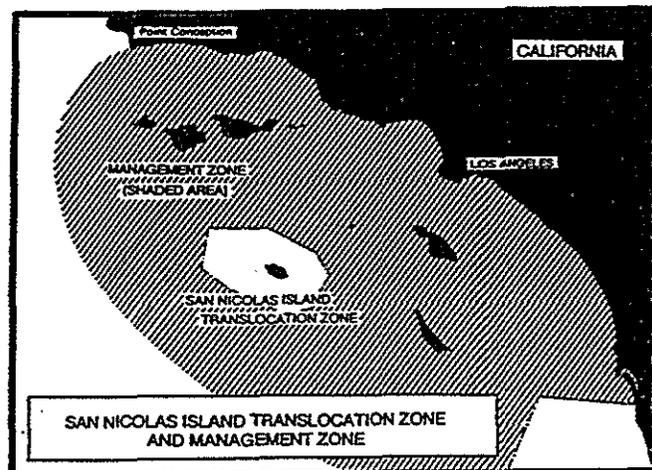


Figure 9. Sea otter translocation zone around San Nicolas Island and the no-otter management zone off southern California.

The reason for the lack of growth has not been determined. The possibilities include mortality from natural causes, entrapment in lobster pots, illegal shooting, and dispersal of pups after weaning.

Population Status — When the southern sea otter was listed as threatened in 1977, it was assumed that the population was increasing and would continue to increase at about five percent per year for the foreseeable future. As noted in previous Commission reports, subsequent studies indicated that substantial numbers of sea otters were being caught and killed incidentally in coastal gill and trammel net fisheries and that this incidental take was sufficient to stop and possibly reverse the population increase (see Appendix B, Bishop 1985, Henry 1986, Hatfield 1991).

Large numbers of seabirds and other non-target species were also being caught and killed in these fisheries. Therefore, beginning in 1982 the State of California enacted a series of regulations prohibiting gill and trammel nets in areas where seabirds, sea otters, and other marine mammals were likely to be caught and killed. These prohibitions substantially reduced the incidental take of sea otters, and in the mid-1980s population growth resumed. The expected range expansion was one of the factors that led to the translocation and zonal management program implemented by the Fish and Wildlife Service in 1987.

Table 7. California sea otter population counts, 1984-1999

<u>Year</u>	<u>Independent Otters</u>	<u>Dependent Pups</u>	<u>Total</u>
1984 Spring	1,180	123	1,303
Fall	—	—	—
1985 Spring	1,119	242	1,361
Fall	1,065	150	1,215
1986 Spring	1,358	228	1,586
Fall	1,091	113	1,204
1987 Spring	1,435	226	1,661
Fall	1,260	110	1,370
1988 Spring	1,504	221	1,725
Fall	—	—	—
1989 Spring	1,571	285	1,856
Fall	1,492	115	1,607
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
1995 Spring	2,095	282	2,377
Fall	2,053	137	2,190
1996 Spring	1,963	315	2,278
Fall	1,858	161	2,019
1997 Spring	1,919	310	2,229
Fall	2,008	197	2,205
1998 Spring	1,955	159	2,114
Fall	1,726	211	1,937
1999 Spring	1,858	232	2,090
Fall	1,808	162	1,970

Source: The U.S. Fish and Wildlife Service, the California Department of Fish and Game, and the U.S. Geological Survey

As indicated in Table 7, the number of sea otters counted during the annual spring and fall surveys has declined since 1995. The cause of the decline has not

been determined. Possibilities include shifts in distribution so that newly occupied areas are not being surveyed or considered appropriately in developing the population estimates; incidental take in new live-trap fisheries or existing gill and trammel net fisheries; new or unusual diseases such as feline encephalitis; exposure to new or higher levels of chemical pollutants; and decreases in key prey species due to temporary El Niño effects, long-term climate change, or sea otter densities exceeding carrying capacity in parts of the California range.

Population Management — In the spring of 1998 approximately 100 sea otters moved south of Point Conception, the northern boundary of the sea otter management zone established by the regulations governing the translocation of sea otters to San Nicolas Island. The Fish and Wildlife Service decided to defer capture and removal of these otters from the management zone as required by the regulations, pending consultation with the affected stakeholders. Factors contributing to this decision were (1) uncertainty concerning the cause or causes of the apparent population decline; (2) insufficient funding to mount the level of effort required to capture and remove large numbers of otters from the management zone; (3) the deaths of several otters during and following previous capture-release experiments that raised questions as to whether the capture and removal of otters from the management zone would meet the requirement that the management zone be maintained by non-lethal means; (4) the return of all or a substantial portion of the animals in the management zone to the sea otter range north of Point Conception could cause depletion or further depletion of food resources available to the animals that had remained there, make the animals more vulnerable to disease, and accelerate the population decline; (5) the lack of suitable unoccupied habitats outside the current sea otter range in California to which the animals from the management zone could be moved without precipitating conflicts with fisheries in those areas; (6) the *Exxon Valdez* oil spill in Prince William Sound, Alaska, in 1989 demonstrated that a single oil spill could affect an area larger than the current California sea otter range, including the area around San Nicolas Island; and (7) the Southern Sea Otter Recovery Team had previously recommended that the Service abandon the zonal management concept.

As noted in the Commission's previous report, the Fish and Wildlife Service held public meetings in Santa Barbara and Monterey, California, in August 1998 to seek public input regarding possible management options. At the meetings, the Service announced that it was reinitiating consultations pursuant to section 7 of the Endangered Species Act to reexamine the sea otter translocation program in light of new information. In March 1999 the Service made available for public review and comment the "Draft Evaluation of the Southern Sea Otter Translocation Program" and the "Draft Memorandum concerning Re-Initiation of Formal Consultations on the Containment Program of the Southern Sea Otter." These drafts set forth the Service's preliminary determinations that (1) the efforts to establish a reserve breeding colony at San Nicolas Island should be declared a failure; (2) the zonal management concept should be abandoned; (3) sea otters should be allowed to naturally recolonize their former range, both to the north and to the south of their current range in California, at least until such time as the population is removed from the List of Endangered and Threatened Wildlife; and (4) containment of sea otters would result in jeopardy to the species in violation of the Endangered Species Act.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the prepublication drafts of these two documents and provided comments to the Service on 1 April 1999. The Commission noted that it shared the Service's concern regarding the apparent population decline and the potentially catastrophic impacts of a large oil spill. However, the Commission questioned whether the two documents adequately supported determinations that the translocation program should be declared a failure and that the concept of zonal management should be abandoned, and indicated where additional data or analyses were required to support the determinations. In this context, the Commission pointed out that an average of five pups had been born each year at San Nicolas Island to a population averaging fewer than 20 adults, yet the draft documents provided no indication of what, if anything, the Service has done to determine why the colony had not grown as expected.

The Commission also noted that the draft documents did not indicate what is being done or proposed

to resolve the uncertainties concerning the cause or causes of the apparent population decline and the unexpected movement of large numbers of otters into the management zone south of Point Conception. In addition, the Commission noted that neither document provided assessments of (a) the likely success of steps being taken to reduce the risks and impacts of oil spills, or (b) the possible positive and negative effects of the proposed actions on commercial and recreational finfish and shellfish fisheries. The Commission also noted that the nine conservation recommendations included in the draft memorandum concerning reinitiation of section 7 consultation on the containment program were not described in sufficient detail to judge whether they would contribute significantly to identifying and eliminating threats to the population.

Several California state agencies, environmental groups, fisheries groups, and others with related interests or responsibilities provided comments to the Fish and Wildlife Service on the draft documents made available for comment in March 1999. In general, environmental organization supported, and fishery-related organizations opposed, the preliminary determinations. Earlier, Friends of the Sea Otter, by letter of 4 August 1998 to the Director of the Fish and Wildlife Service, had expressed concern about the effects and effectiveness of zonal management and had advised the Service that it would contemplate legal action if an attempt was made to capture and remove the sea otters that had moved into the management zone earlier in the year.

Most of the otters that had moved into the management zone in the early spring of 1998 moved out of the zone later in the year. However, in the first half of 1999, more than 100 otters again moved into the management zone south of Point Conception and remained there through the summer and early fall. In response, the Commercial Fishermen of Santa Barbara, Inc. and the California Abalone Association, Inc. advised the Secretary of the Interior and the Director of the Fish and Wildlife Service by letter of 26 August 1999 that they were prepared to sue the Department and the Service if they failed to remove the otters from the management zone as required by the regulations implementing Public Law 99-625. Subsequently, the Friends of the Sea Otter, on behalf of itself and several other environmental groups,

advised the Secretary and the Director of their strong objection to any further containment efforts and intent to take legal action, if necessary, to stop such effort.

The status and management of the California sea otter population was a principal agenda item at the annual meeting of the Marine Mammal Commission and its Committee of Scientific Advisors held in Seaside, California, on 19-21 October 1999. To obtain the most up-to-date information and range of views, the Commission invited representatives of the responsible and potentially affected state agencies, federal agencies, and private interest groups to attend and present related data, information, and viewpoints at the meeting. The meeting was attended by representatives of the Fish and Wildlife Service; the Biological Resources Division of the U.S. Geological Survey; the National Marine Fisheries Service; the Monterey Bay and Channel Islands National Marine Sanctuaries; the Channel Islands National Park; the California Department of Fish and Game; the California Fish and Game Commission; the California Coastal Commission; the Sea Urchin Harvesters' Association of California; the Abalone and Marine Resources Council of California; the California Aquaculture Association; the Commercial Fishermen of Santa Barbara, Inc.; the Pacific Coast Federation of Fishermen's Association; the University of California, Davis; the Southern Sea Otter Recovery Team; the Monterey Bay Aquarium; the Friends of the Sea Otter; the Humane Society of the United States; The Otter Project; and the Center for Marine Conservation.

From the information presented at the meeting, it was evident to the Commission and its Committee of Scientific Advisors that it is not known why the attempt to establish a reserve sea otter colony at San Nicolas Island has been unsuccessful, why the mainland sea otter population apparently has been declining, or what triggered the movement of large numbers of otters into and out of the management zone south of Point Conception in 1998 and again in 1999. Further, it was apparent that funding and personnel constraints had limited what could be done to resolve these uncertainties.

It also was apparent that, if large numbers of otters again move south into the management zone, capturing and returning the otters to the parent population

could have negative impacts on the population. Further, it was apparent that recolonization of the currently unoccupied historic sea otter range in California possibly could prevent or impede restoring one or more of the abalone stocks that have been depleted by overharvesting, as well as impact shellfish fisheries that developed in the absence of otters. It also appeared that the Fish and Wildlife Service has neither assessed possible alternatives to capture and relocation for regulating sea otter distribution and abundance nor developed a long-range conservation strategy as called for in the memorandum of understanding regarding the translocation and study of sea otters signed by the Service and the California Department of Fish and Game in August 1987.

During the meeting in Seaside, the Fish and Wildlife Service advised the Commission that it expected to complete a draft revision of the Southern Sea Otter Recovery Plan for public review in January 2000 and to complete and adopt the revised plan by mid-year. The Commission believes that a number of actions could and should be taken to protect and promote recovery of the California sea otter population pending completion and adoption of the updated recovery plan. As a first step in this regard, the Commission, in consultation with its Committee of Scientific Advisors, developed and on 23 December 1999 forwarded to the Fish and Wildlife Service a Draft Action Plan to Promote Recovery of and Identify the Optimal Conservation Strategy for the California Sea Otter Population.

The draft plan, copies of which can be obtained from the Commission, outlined and explained the rationale for 12 tasks that the Commission and its Committee of Scientific Advisors believe should be undertaken as soon as possible to expedite recovery of the population and to identify and maintain the population at its optimum sustainable level. The draft plan also provided cost estimates and identified target initiation and completion dates, and the agencies that logically would be responsible for carrying out, and helping to carry out, the various tasks.

The 12 tasks identified in the draft plan were (1) evaluation of available information that might provide insight to the possible reasons why the San Nicolas Island colony has not grown as expected; (2) compila-

tion and analysis of relevant data sets to look for correlations that might explain the cause of the population decline; (3) continuation and expansion of the gillnet fisheries observer program to obtain a reliable estimate of sea otter bycatch in these fisheries; (4) evaluation and, if feasible, modification of fish and lobster traps to prevent sea otter entrapment; (5) design and conduct of a population and habitat assessment study; (6) evaluation of both the beneficial and adverse biological, ecological, and socioeconomic consequences of unregulated range expansion; (7) assessment of the potential for enhancing sea urchin and abalone productivity and harvest yields by habitat augmentation; (8) determination of whether vessel routing and other measures have reduced the risk of oil spills occurring and endangering the sea otter population; (9) further assessment of threats posed by diseases and contaminants, and measures that possibly could be taken to eliminate or minimize the threats; (10) assessment of how geographic information systems might be used to facilitate exchange and analysis of data needed for management purposes; (11) completion of the updated recovery plan and development of a long-range strategy for managing the population after it has recovered to the point that it can be removed from the List of Endangered and Threatened Wildlife; and (12) continuation and, if necessary, modification of the design of the spring and fall population surveys and the recovery and necropsy of beach-cast carcasses.

As noted earlier, Fish and Wildlife Service representatives indicated during the Commission's 19-21 October meeting that the draft update of the Southern Sea Otter Recovery Plan was expected to be available for public review in January 2000. The Commission therefore recommended that the Service convene a meeting of appropriate representatives of the agencies and organizations with related interests and responsibilities before the end of February 2000 to (1) review and assign priorities to the tasks identified in the draft recovery plan update and the draft action plan provided by the Commission; (2) identify ongoing or additional research, monitoring, and management programs that should be afforded priority consideration; (3) reach agreement on the agencies, and the groups within agencies, that will be responsible for the various tasks; (4) determine when the various tasks reasonably can be initiated and completed in light of

limited funding or other constraints; and (5) if available funding is insufficient to begin implementing the priority tasks immediately, determine whether the required funding can be obtained through reprogramming, requesting supplemental funds, or other means so that critically important tasks can be undertaken in fiscal year 2000.

At the end of the year, it was the Commission's understanding that the Fish and Wildlife Service was working to complete the public review draft of the updated Southern Sea Otter Recovery Plan early in January 2000 and that it planned to convene a meeting of interested and responsible agencies and organizations, as recommended by the Commission, to consider both documents and ensure that needed actions, agency responsibilities, and funding requirements and priorities are appropriately identified and agreed upon.

The Alaska Sea Otter Population

Small groups of sea otters survived commercial exploitation in several remote areas of Alaska. Since commercial exploitation ended in 1911, those groups have grown and repopulated much of the historic sea otter range in Alaska. No otters survived in southeastern Alaska and, in the late 1960s and early 1970s, otters were translocated to the area from Amchitka Island and Prince William Sound.

As noted in previous Commission reports, threats to sea otters in Alaska include (1) conflicts with commercial, subsistence, and recreational shellfish fisheries that developed before sea otters recolonized areas where fisheries had developed in their absence; (2) incidental take in gillnet and other fisheries; (3) offshore oil and gas exploration and development; (4) tankering of oil and other potentially hazardous substances; (5) logging, mariculture, and other coastal development; (6) Native subsistence hunting; and (7) the increasing tourist industry. Threats related to tankering of oil were illustrated by the 1989 *Exxon Valdez* oil spill, which directly killed several thousand sea otters and may have affected many others through contamination and destruction of prey species.

Population Status and Trends — The 1994 amendments to the Marine Mammal Protection Act require that the Fish and Wildlife Service and the

National Marine Fisheries Service periodically assess the status of all marine mammal stocks for which they are responsible. The Fish and Wildlife Service's initial Alaska sea otter stock assessment, completed in 1995, estimated that there were approximately 100,000 sea otters in Alaska and that both population size and range were continuing to grow.

As noted in the Commission's previous annual report, the Fish and Wildlife Service advised the Commission in 1996 that sea otter abundance in the vicinity of Adak Island had declined dramatically and that the cause or causes of the decline were unknown. At the Commission's meeting in Fairbanks, Alaska, in November 1997 Service representatives advised the Commission that the cause or causes of the sea otter decline remained unknown, that declines also may have occurred in adjacent areas, and that researchers from the Biological Resources Division of the U.S. Geological Survey were seeking, but had not yet received, funding for studies to determine the geographic extent and cause of the decline. Subsequently, the Commission requested and the Fish and Wildlife Service's Alaska Regional Office provided its assessment of what was needed and what was being done to document the causes and extent of the decline.

At the Commission's annual meeting in Portland, Maine, on 10-12 November 1998, representatives of the Service advised the Commission that the Service had been able to undertake some of the studies necessary to assess the possible cause or causes of the decline, but had not received funding to conduct the abundance surveys necessary to determine the magnitude and extent of the decline. Information presented at the Portland meeting and reported in the 16 October 1998 issue of *Science* suggested that the sea otter decline might be due to increased killer whale predation brought about by decreases in Steller sea lions and harbor seals, the normal prey of killer whales in the Adak area.

At the Commission's annual meeting on 19-21 October 1999, representatives of the Fish and Wildlife Service and the Biological Resources Division of the U.S. Geological Survey reported that the sea otter decline in the Aleutian Islands has continued and that, although the geographic extent of the decline is unknown, abundance apparently has been reduced by

an order of magnitude in some areas. The Commission was also advised that, although plans for a rangewide sea otter census in Alaska had been prepared, funding for the census has not been provided.

In light of the apparent magnitude of the decline, and the effect it may be having on the welfare of the western Alaska sea otter population and the general health and stability of the ecosystem of which it is a part, the Commission, in a letter dated 23 November 1999, recommended that the Service reprogram funds, seek supplemental funding, or take other steps as may be necessary to conduct a rangewide census in the late spring or early summer of 2000. The Commission also recommended that the Service consult with the National Marine Fisheries Service to determine if there have been apparent changes in killer whale abundance, distribution, movements, foraging behavior, or general condition in and near the areas where the sea otter decline has occurred, and explore with the National Marine Fisheries Service the possibility of combining efforts to survey killer whale distribution, abundance, and general condition in conjunction with the recommended rangewide sea otter survey. At the end of the year, it was the Commission's understanding that funding had been obtained for an aerial survey of the Aleutian Islands in spring 2000 and that funding to survey the Alaska Peninsula and the Kodiak Archipelago was being sought.

Revised Stock Assessment — As noted earlier, the Fish and Wildlife Service published an Alaska sea otter stock assessment report in 1995. In February 1998 the Service published for public review and comment a draft revision of this stock assessment report. Based on distributional data and genetic studies, the draft revision identified three provisional Alaska sea otter stocks: (1) a southeastern stock with a minimum estimated population size of 8,709, located from the U.S.-Canadian border to Cape Yakataga; (2) a south-central stock, with a minimum population size of 20,948, located between Cape Yakataga and the east coast of Cook Inlet; and (3) a southwestern Alaska stock, with a minimum population estimate of 65,761, located from the west side of Cook Inlet through the Kodiak Archipelago, the Alaska Peninsula, and the Aleutian Islands.

As noted in the Commission's previous annual report, the Alaska Sea Otter Commission requested on 31 August 1998 that the Fish and Wildlife Service hold a formal hearing, as provided for in the 1994 amendments to the Marine Mammal Protection Act, to review the basis for the Service's decision to reclassify Alaska sea otters into three separate stocks. Subsequently, the Alaska Sea Otter Commission assumed responsibility for representing Alaska Native interests regarding Steller sea lions as well as sea otters, and was renamed the Alaska Sea Otter and Steller Sea Lion Commission. In July 1999 this Commission and the Fish and Wildlife Service entered into a memorandum of agreement specifying steps to be taken by the two entities by 1 March 2000 to identify and obtain scientific peer review of the best available information concerning the differentiation of sea otter stocks in Alaska. By letter of 12 August 1999 the Chair of the Alaska Sea Otter Commission officially withdrew the Commission's request for a formal hearing regarding the Service's decision to reclassify Alaska sea otters into three separate stocks.

Marking, Tagging, and Reporting — Section 101(b) of the Marine Mammal Protection Act exempts Alaska Natives from the Act's moratorium on taking of marine mammals provided the taking is for subsistence purposes or purposes of creating and selling authentic Native articles of handicrafts and clothing and is not done in a wasteful manner. In 1981 the Act was amended to authorize the Fish and Wildlife Service and the National Marine Fisheries Service to require marking, tagging, and reporting of marine mammals taken by Alaska Natives for subsistence or handicraft purposes. The intent of the amendment was to help the Fish and Wildlife Service and the National Marine Fisheries Service control illegal trade in products from species taken by Alaska Natives and to obtain better information on the species and numbers of marine mammals taken for subsistence and handicraft purposes.

Marking, tagging, and reporting regulations were promulgated 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, Alaska Natives must report the take to the Service and present pelts and other specified parts to be marked or tagged. Since the regulations were promulgated, the

Service has worked closely with Native groups in the State of Alaska to implement the marking, tagging, and reporting program. The number of sea otter pelts presented for tagging in the years 1990 through 1998 were 166, 231, 637, 1,248, 835, 629, 608, 755, and 844, respectively. By the end of 1999, 531 sea otter pelts had been presented by Alaska Natives for tagging although additional tagging reports are expected.

Co-management of Sea Otters — The Alaska Sea Otter Commission was formed in December 1988 to promote Native participation in the development of policies and programs affecting the conservation and Native hunting of sea otters in Alaska. The Commission is composed of representatives of Native communities in the parts of Alaska where sea otters occur.

As noted in previous annual reports, a memorandum of agreement regarding cooperative efforts to conserve sea otters in Alaska 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 1994 amendments to the Marine Mammal Protection Act added a new section (section 119) authorizing the Secretaries of Commerce and the Interior to fund development of cooperative agreements with Alaska Native organizations to conserve and co-manage marine mammals used by Alaska Natives for subsistence and handicraft purposes. Under these agreements, the Secretary may provide grants to Native organizations for, among other things, collecting and analyzing data on marine mammal populations, monitoring and collecting samples from subsistence harvests, participating in marine mammal research and monitoring programs, and developing co-management programs and agreements.

The Fish and Wildlife Service and the Alaska Sea Otter Commission signed a co-management agreement on Alaska sea otters in 1997. Under the agreement, the Service provided \$70,000 annually to the Commission in fiscal years 1997, 1998, and 1999 for co-management activities. Among other things, these funds have been used to train and provide equipment and supplies to Alaska Natives to collect basic life history information and biological samples from otters taken for subsistence and handicraft purposes, and from otters found dead on beaches.

By the end of 1999, 58 individuals from 44 villages throughout the sea otter range in Alaska had been trained and provided with equipment and supplies necessary to necropsy sea otters and provide data and tissue samples to the Fish and Wildlife Service. Through this program, samples have been obtained from 249 sea otters taken for subsistence and handicraft purposes and from 54 dead, beach-cast animals.

During the Marine Mammal Commission's meeting in Seaside, California, on 19-21 October 1999, the Service advised the Commission that it was seeking additional funding for the co-management programs and that Alaska Native organizations were being consulted to determine whether further amendment of the Marine Mammal Protection Act should be sought to provide for co-management of harvested species prior to depletion.

Florida Manatee *(Trichechus manatus latirostris)*

The Florida manatee, a subspecies of the West Indian manatee, occurs only in the rivers, estuaries, and nearshore waters of the southeastern United States. Inhabiting the northern end of the species' range, the Florida population is the species' largest known population. From Florida, the species' range extends southward along the Atlantic and Caribbean coasts to Brazil and is occupied by a second subspecies, the Antillean manatee, *T. m. manatus*.

In winter, Florida manatees occur mostly in the central and southern parts of the Florida peninsula. Because prolonged exposure to water temperatures below about 65°F (18°C) can be lethal to manatees, most overwintering Florida manatees remain either at or near natural and artificial warm-water sources (*e.g.*, natural warm-water springs and thermal outfalls from power plants), where they can escape thermal stress associated with periodic cold fronts, or in southernmost Florida where water temperatures generally remain above 65°F. In spring, as water temperatures rise, Florida manatees disperse from overwintering sites. Although most animals stay in Florida during the summer, a few move into Georgia and the Carolinas on the east coast, and Louisiana

along the Gulf of Mexico coast. In extreme cases, animals have traveled as far north as Rhode Island and as far west as Texas.

To date, a reliable means of estimating total population size has eluded manatee researchers. Manatee counts at several major warm-water refuges have been undertaken during periods of cold weather every year since the late 1970s. However, because of uncertainty as to the number of manatees away from these sites at the time surveys are conducted, it is not possible to extrapolate these counts into a useful population estimate. Notwithstanding this limitation, maximum one-day counts at many of these refuges have increased steadily over the past 20 years, suggesting that the present number of Florida manatees is now larger by some uncertain amount than when the counts first were made. In this regard, an analysis of winter counts along Florida's east coast between 1982 and 1998 revealed an overall increase in the population of about six to eight percent per year between 1982 and 1989, followed by a period of stability or slower growth ranging from about zero to four percent per year in the 1990s. Another analysis of adult survival rates along the east coast revealed a similar population trend. With high levels of mortality in recent years and neither study ruling out a possible decrease in manatee numbers along Florida's east coast, some scientists believe that the growth of at least some segments of the population may have stopped or even decreased in recent years, while other segments may have continued to grow.

In 1991 the State of Florida began conducting one-day statewide manatee surveys timed to occur a day or two after the arrival of winter cold fronts when it is thought most manatees are likely to have moved into refuge areas. Although these synoptic surveys are subject to the same limitations in estimating total population size as noted above, the actual counts establish a reliable lower limit for the estimate of population size. In February 1996 a statewide manatee survey recorded its highest single count since the surveys began — 2,639 manatees. Because there appears to be very little movement of manatees between the east and west coasts of Florida, a combination of the all-time highest east coast count of 1,457 manatees in 1996 and a then-record west coast count

Table 8. Known manatee mortality in the southeastern United States (excluding Puerto Rico) reported through the manatee salvage and necropsy program, 1978–1999

<u>Year</u>	<u>Vessel-Related Deaths</u> <u>No. (%)</u>	<u>Flood Gate and Lock Deaths</u> <u>No. (%)</u>	<u>Other Human-Related Deaths¹</u> <u>No. (%)</u>	<u>Perinatal Deaths</u> <u>No. (%)</u>	<u>Other Deaths²</u> <u>No. (%)</u>	<u>Total Deaths in S.E. U.S.</u>
1978	21 (25)	9 (11)	1 (1)	10 (12)	43 (51)	84
1979	24 (31)	8 (10)	9 (12)	9 (12)	28 (36)	78
1980	16 (25)	8 (12)	2 (3)	13 (20)	26 (40)	65
1981	24 (21)	2 (2)	4 (3)	13 (11)	74 (63)	117
1982	20 (17)	3 (3)	2 (2)	14 (12)	78 (67) ³	117
1983	15 (19)	7 (9)	5 (6)	18 (22)	36 (44)	81
1984	34 (26)	3 (2)	1 (1)	26 (20)	66 (51)	130
1985	35 (28)	3 (2)	3 (2)	23 (19)	59 (48)	123
1986	33 (26)	3 (2)	1 (1)	27 (22)	61 (49)	125
1987	39 (33)	5 (4)	4 (3)	30 (26)	39 (33)	117
1988	43 (32)	7 (5)	4 (3)	30 (22)	50 (37)	134
1989	51 (29)	3 (2)	5 (3)	39 (22)	78 (44)	176
1990	49 (23)	3 (1)	4 (2)	45 (21)	113 (53)	214
1991	53 (30)	9 (5)	6 (3)	53 (30)	54 (30)	175
1992	38 (23)	5 (3)	6 (4)	48 (29)	70 (42)	167
1993	35 (24)	5 (3)	7 (5)	39 (27)	61 (41)	147
1994	51 (26)	16 (8)	5 (3)	46 (24)	76 (39)	194
1995	43 (21)	8 (4)	5 (2)	56 (28)	91 (45)	203
1996	60 (14)	10 (2)	1 (0)	61 (15)	284 (68) ⁴	416
1997	55 (22)	8 (3)	9 (4)	61 (25)	113 (46)	246
1998	67 (28)	9 (4)	7 (3)	52 (21)	108 (44)	243
1999 ⁵	83 (30)	15 (5)	8 (3)	52 (19)	116 (42)	274

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

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

3 Includes 38 deaths attributed to a spring red-tide event in southwestern Florida.

4 Includes 149 deaths attributed to a spring red-tide event in southwestern Florida.

5 Data for 1999 are preliminary.

Source: Florida Department of Environmental Protection.

of 1,326 manatees in 1997 (a count made after a large red-tide-related manatee die-off in 1996 in southwestern Florida) suggests that a minimum population size of about 2,800 animals is reasonable. In 1999 a new record high count of 1,397 manatees was recorded on the west coast of Florida.

Florida manatees, listed as endangered under the Endangered Species Act, are one of the most endangered marine mammals in U.S. waters. The principal

threats to their well-being are human-related mortality and habitat degradation. Population mortality is monitored through an intensive manatee carcass salvage and necropsy program now operated by the Florida Fish and Wildlife Conservation Commission. As shown in Table 8, in most years manatee deaths due to human causes have been responsible for about one-quarter to one-third of all known manatee deaths. In 1999, however, human-related manatee deaths reached 38 percent of the total mortality. The vast majority of

such deaths were caused by collisions with watercraft, which reached a record level of 83 during 1999. Other sources of human-related manatee deaths in 1999 included entrapment in flood gates and navigation locks (15), entrapment in culverts and pipes (5), ingestion of marine debris (2), and entanglement in monofilament fishing line (1).

Perhaps an even greater long-term threat to the population, however, is habitat degradation. In the last 40 years, extensive flood control efforts and channelization have drastically altered stream flow in the Everglades and other parts of southernmost Florida, the core of the species' historic winter range. In addition, coastal development and pollution have damaged or destroyed grassbeds essential as manatee feeding areas; shoreline development and vessel traffic have reduced the number of secluded areas for resting, calving, and nursing; and artificial thermal outfalls from power plants and other industrial facilities have shifted the population's winter range northward into colder areas where survival is dependent on the continued reliability of warm-water discharges during cold winter periods.

Manatee recovery efforts, therefore, have focused on reducing sources of human-related manatee mortality, protecting manatee habitat, and developing information on manatees and manatee habitat necessary to make informed management decisions.

The Fish and Wildlife Service in the Department of the Interior has lead responsibility for the recovery of Florida manatees under the Endangered Species Act and the Marine Mammal Protection Act. Assisting the Service is the Sirenia Project, a manatee research team that develops fundamental biological and ecological data on manatees. Initially established as part of the Fish and Wildlife Service, the Sirenia Project is now part of the U.S. Geological Survey, an agency also within the Department of the Interior. To help identify and direct priority research and management tasks, the Service, with assistance from the Marine Mammal Commission, developed a manatee recovery plan that initially was adopted in 1980. As the first recovery plan for any marine mammal, it has served as a model plan for other marine mammal species. It has been updated at five-year intervals with assistance from a Service-appointed Florida Manatee Recovery

Team composed of representatives of interested federal, state, and county agencies, industry groups, environmental organizations, independent scientists, and the boating public. As discussed in previous annual reports, the Marine Mammal Commission played a major role in preparing the most recent recovery plan update adopted in 1996.

Although the Service has lead responsibility for protecting Florida manatees under federal law, the broad array of recovery tasks requires extensive cooperation and support from many agencies and groups. In this regard, the State of Florida has assumed a co-leadership role with the Service. Through establishment of the Save the Manatee Trust Fund by the state legislature in 1989, the state has become the principal source of funding for many vital recovery tasks. The staff of the Bureau of Protected Species Management and the Florida Marine Research Institute (formerly in the Florida Department of Environmental Protection but shifted in 1999 to the newly established Florida Fish and Wildlife Conservation Commission) also have taken the lead in carrying out many fundamental recovery tasks. Among other things, they promulgated countywide boat speed regulations to slow boats down in key areas where manatees are likely to be hit, assumed responsibility for the manatee salvage and necropsy program, and developed a geographic information system to archive and analyze data on manatees and manatee habitat.

Even with strong support by the Fish and Wildlife Service, the U.S. Geological Survey, and the Florida Fish and Wildlife Conservation Commission, the involvement of other agencies and groups has been necessary to address essential manatee recovery tasks. In this regard, the Army Corps of Engineers and the South Florida Water Management District have taken steps to reduce manatee deaths in flood gates and navigation locks, the U.S. Coast Guard and the Florida Marine Patrol have helped enforce boat speed regulations, the Save the Manatee Club has helped fund and purchase equipment for numerous recovery projects, the Florida Power & Light Company has supported manatee surveys at major warm-water power plant outfalls and the development of public education materials on manatees, marine zoological parks and oceanaria have helped rescue and rehabilitate injured and orphaned manatees, and the Marine

Mammal Commission has continued to provide involved agencies and groups with timely advice and recommendations on recovery priorities as developments and new information arise.

As discussed below, major efforts in 1999 included continuing work to strengthen enforcement and compliance with boat speed regulations, developing long-term policies and strategies for managing warm-water refuges used by manatees, testing and installing new mechanisms on flood control gates and navigation locks to prevent manatee entrapment, and updating the Florida manatee recovery plan.

Warm-Water Refuges

During winter months most Florida manatees rely on 14 major warm-water refuges located in the southern two-thirds of the Florida peninsula (Fig. 10). Four of these refuges are natural warm-water springs (Blue Spring, Kings Bay at the head of the Crystal River, Homosassa Springs, and Warm Mineral Springs) and ten are thermal outfalls from power plants built before the 1970s. Water temperatures at these refuges generally remain above 70°F (21°C) even when surrounding water temperatures drop well below this level during periodic cold spells. When surrounding water temperatures permit, manatees regularly move in and out of the refuges to feed. Although most manatees exhibit a high degree of site fidelity to particular refuges, some use more than one refuge during a winter season and some occasionally use different refuges in different winters. In addition to these 14 major warm-water refuges, smaller springs and industrial outfalls, as well as some dredged basins where deep water is slow to cool, are used by a few animals to escape cold temperatures. Some of the smaller refuges occur as far north as Georgia and are often used briefly by travelling manatees.

Thermal outfalls from power plants have had a profound effect on manatee distribution. Historically, the population's winter range is thought to have been limited principally to southernmost Florida where water temperatures rarely drop much below 65° F. Most major artificial warm-water refuges, however, are north of that area in waters that typically dip to below this level several times each winter. Over the

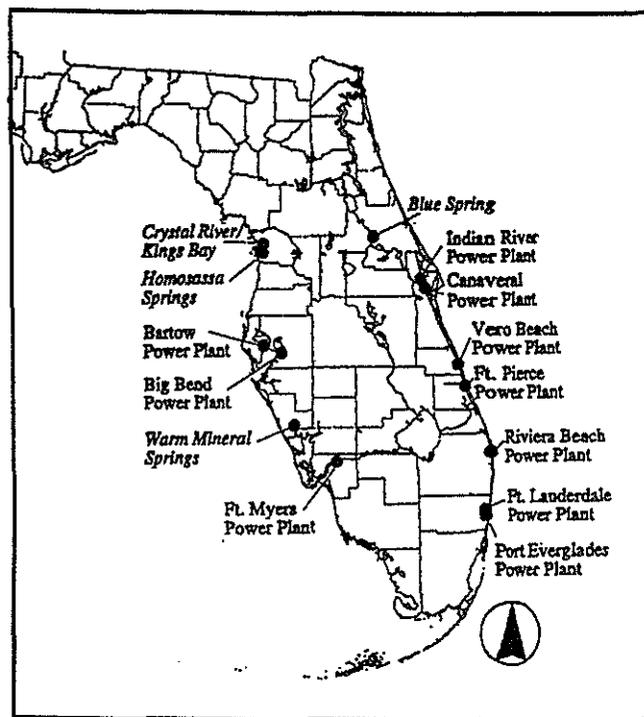


Figure 10. Major warm-water refuges for Florida manatees with maximum counts of 40 or more animals. (Figure by Leslie Ward, courtesy of Florida Marine Research Institute)

past 20 years the number of manatees using these sites has increased substantially. In recent years, single-day counts of more than 200 animals have been made at several sites, and at two adjacent power plants near Cape Canaveral, 585 manatees were counted during a single survey in December 1997. As manatee numbers at artificial refuges have increased, so too have their numbers at the three major natural warm-water springs that mark the northern limit of the population's core winter range. In part, increases at these natural springs may reflect an influx of animals that learned to use artificial refuges north of the historic winter range.

Ironically, although artificial refuges have caused large numbers of manatees to overwinter in colder latitudes, they also may have reduced the frequency of cold-related manatee deaths by providing reliable warm-water sources in winter. In especially cold winters, water temperatures even in southernmost Florida may drop below thermal tolerance levels for some animals, particularly juveniles. Thus, extreme

cold events may have been a more important mortality factor limiting population size before thermal industrial outfalls were available. Now, with large numbers of manatees escaping cold weather by retreating into warm-water refuges even in southern Florida, the population may be experiencing fewer cold-related deaths, thereby reducing a factor that previously may have limited population size.

As the dependence of manatees on warm-water refuges north of their historic range has increased, so too have the risks of significant population impacts. The elimination or sporadic shut-down of a warm-water industrial discharge could cause a large-scale die-off of manatees unable to find alternative warm-water sources during a winter cold snap. Although power plants have generally provided reliable warm-water sources to date, it is inevitable that existing facilities producing warm water will eventually close. In light of regulatory requirements developed since those plants were built, which prohibit authorizing similar thermal discharges from new plants, it is unlikely that they would be replaced. Even natural warm-water springs face an uncertain future due to increased pumping of groundwater. At Blue Spring, a major manatee refuge on the upper St. Johns River, a recent study found that the mean spring discharge declined by 13 percent between the period 1932-1975 and the period 1985-1994 even though average rainfall in the aquifer recharge area was greater in the latter period. In addition, large aggregations of manatees in confined warm-water refuges can increase the risk of exposure to diseases, pollution events, or naturally occurring biotoxins produced by red tides.

To help ensure reliable warm-water discharges in winter, the Service and the state's Bureau of Protected Species Management work closely with operators of power plants and other industrial facilities to develop manatee protection plans. These plans, required as a condition for receiving plant discharge permits under the Clean Water Act, are designed to minimize the risk of interrupting warm-water discharges during critical winter periods. They include provisions relating to maintenance schedules and minimum effluent flows during cold periods.

Although strong industry cooperation has helped ensure the reliability of power plant thermal discharg-

es, important long-term issues have not been addressed. These include planning for eventual plant closures and facility modifications that would eliminate warm-water refuges, as well as possible effects due to the aggregation of increasingly large numbers of manatees in confined refuges. Over the past four years, several developments in particular have underscored the urgency to address these issues.

First, a die-off of about 150 manatees occurred during a six-week period in the spring of 1996 along a short stretch of coast in southwestern Florida. Caused by a natural biotoxin produced by a red tide, the event illustrated the potential impact that could be expected when a large number of manatees concentrated in a limited area is exposed to a lethal perturbation.

Second, late in 1997 a small warm-water discharge produced by effluent from a paper mill near the Florida-Georgia border was rerouted through diffuser pipes into deeper water to improve water quality. The change effectively eliminated a small pool of warm water used by a few manatees overwintering in northeastern Florida and southern Georgia. To assess effects of the action on manatees, researchers with the Sirenia Project, the Georgia Department of Natural Resources, the Florida Marine Research Institute, and the state tagged and tracked several of the area's animals before the switch to the diffuser pipe was made. They found that during the winter of 1997-1998, a few manatees moved south to power plant outfalls along Florida's east coast, but most did not. Instead, most animals moved to a small, marginal refuge at a paper mill in southern Georgia. Some animals made repeated visits to the former refuge apparently looking for warm water. An unusually large percentage of the region's winter manatee population died when the switch was made, even though the winter was unusually mild. The results reinforced concern that ingrained habitat-use patterns place manatees at risk of cold stress when warm-water refuges are eliminated.

Third, the state began considering the pros and cons of deregulating its electric utility industry in order to increase industry competition and lower electric utility rates. Doing so would encourage the formation of small local electric companies to supply electricity at less cost by purchasing it from remote

locations, such as Georgia, or by building small cost-efficient plants that could not discharge warm water. Such competition could lead to temporary or permanent shutdowns of some existing power plants on which manatees have come to depend. Some of these plants are more than 30 years old and approaching the end of their planned operational life.

Warm Water Workshop — In light of these developments, the Commission wrote to the Service on 23 December 1997 requesting information on steps being taken to prepare for possible deregulation of Florida's electric utility industry and to ensure that relevant state and federal planning processes were considering possible effects on manatees. The Service's 22 January 1998 reply noted that it planned to convene a workshop in 1998 to bring together agency and industry officials, as well as other interested parties, to address critical issues related to the dependence of manatees on warm-water refuges.

The Commission endorsed the idea and on 5 June 1998 wrote to the Service to provide comments and recommendations on planning for the workshop and the issue in general. In its letter, the Commission noted that, in light of the limited number, size, and location of natural warm-water springs and the extent to which the manatee population's historic winter habitat in southernmost Florida had been modified over the past several decades, it was not clear whether the current manatee population could be supported by natural warm-water refuges and the remaining undisturbed habitat at the southern end of the Florida peninsula. It also noted that, if major artificial warm-water refuges were eliminated or became unavailable, a large number of manatees likely would die from exposure to cold. The Commission therefore suggested that the Service consider two possible approaches: (1) establishing an industry-supported contingency fund to ensure that warm-water discharges continue at selected power plants important to manatees (*e.g.*, by subsidizing selected plants to keep them competitive with other electric utilities or to cover the cost of developing and operating backup systems, such as solar heating units, to discharge warm water when generating units are shut down), and (2) investigating the feasibility of designing a new or supplemental network of warm-water refuges not dependent on industry outfalls (*e.g.*, small embayments designed to

retain warm water from solar heating systems or other non-industry-dependent sources).

To obtain views of other federal and state agencies, the Service convened an interagency meeting on 27-28 August 1998 to discuss issues related to warm-water refuges. During the meeting, participants, including a Commission representative, began developing objectives and an agenda for a warm-water refuge workshop held in August 1999. The participants also considered interim research and management needs. Given the risk of cold stress for manatees in north-eastern Florida and Georgia, and the tendency of far-ranging manatees to interrupt or halt their southward fall migration by stopping at small industrial outfalls in this area, meeting participants agreed that steps should be taken to prevent more manatees from learning to use them. The Service therefore contacted operators of facilities producing warm water in extreme northeast Florida and Georgia and initiated steps to discourage manatees from using thermal outfalls in those areas. During the winter of 1998-1999, only one animal was known to have remained in waters north of Florida.

It was less clear whether steps should be taken to prevent or limit manatee use of major artificial warm-water refuges in central and southern Florida. Although some participants in the August 1998 interagency meeting urged that steps be taken to limit manatee use of power plant outfalls in Brevard County and to encourage their southward movement to areas nearer the species' historic range, others opposed doing so because of uncertainty that habitat south of that area could support all Florida manatees and the risk of increasing cold-related deaths. It was therefore agreed that, pending the warm-water workshop and further analyses of the issue, existing policies to encourage reliable warm-water discharges at major power plant outfalls in central and southern Florida should continue. It also was agreed that steps to improve access to natural warm-water springs within the core of the manatee's current winter range also should be explored.

On 24-25 August 1999 the Fish and Wildlife Service convened the Warm Water Workshop in Jupiter, Florida. Approximately 100 people representing involved electric utilities, government agen-

cies, environmental organizations, and the research community attended. The purpose of the workshop was to define the problem, identify tools and programs to address the issue, identify data needs, and make recommendations for guidelines. was to examine possible options with regard to the long-term availability of warm-water refuges. On the first day, invited speakers reviewed information on thermal tolerances of manatees, trends in the numbers of manatees and the patterns of manatee use at natural and artificial warm-water refuges, operational and regulatory requirements of power plants, and the status of power plant manatee protection plans. On the second day, participants split into three working groups to identify priority research and management needs. The workshop provided a very constructive opportunity to exchange views and ideas about long-term policies, related research needs, and potential management strategies. Further meetings were being planned at the end of 1999.

On 26 August immediately after the workshop, the Service convened the Florida Manatee Recovery Team. In part, the meeting was scheduled to allow team members to consider results of the workshop and how best to address warm-water refuge issues in the next revision of the Florida Manatee Recovery Plan. Based on workshop discussions, the team tentatively identified possible tasks to maintain a safe, reliable network of natural and artificial warm-water refuges for manatees.

In part, the team noted the need to describe and characterize key features of existing warm-water refuges (*e.g.*, proximity to food and fresh water, vulnerability to human disturbance, size, water temperature, *etc.*) that make them attractive to manatees. The team also considered the need for studies to identify and assess feasible options to modify or manipulate the network of warm-water refuges on which manatees depend. Possible approaches include improving access to unutilized or underutilized warm-water springs, limiting access or weaning manatees from warm-water refuges deemed inappropriate or scheduled to be shut down, and assessing the technical and engineering feasibility of building new non-industry-dependent warm-water refuges. The team also considered the need for (1) preparing a document setting forth short- and long-term goals for the desired

number, location, and geographic range of warm-water refuges on the east and west coasts of Florida; (2) implementing measures to achieve those goals; (3) monitoring manatee use at warm-water refuges and associated foraging areas; and (4) establishing a coordinating group to help guide work on managing an optimal network of warm-water refuges.

Boating Regulations

Watercraft collisions are the principal cause of human-related manatee mortality and injury. Of 274 manatee deaths recorded in 1999, 83 (30 percent) were due to boat strikes. In addition, more than half of all living manatees bear scars from propellers and boat hulls. Based on the size of propeller wounds on living and dead manatees, the vast majority of collisions are thought to be caused by recreational boats, rather than large commercial vessels. Manatees are difficult to see from boats, and even when one is hit, boat operators usually are either unaware a collision has occurred, or fail to realize what they hit. Recognizing that boat operators are not able to consistently avoid manatees, wildlife managers responsible for protecting manatees have sought to slow boats down by limiting their maximum speeds in areas where manatees are likely to occur in order to give manatees time to avoid oncoming boats.

The State of Florida, following a 1989 directive by the Florida Governor and Cabinet, has taken the lead in establishing boat speed regulations to protect manatees. Under the directive, the Bureau of Protected Species Management, now part of the Florida Fish and Wildlife Conservation Commission, has negotiated a series of countywide speed zones with local officials and boating interests in each of 13 counties containing much of the state's most important manatee habitat. The process, approached county-by-county, has been arduous and often contentious. To balance manatee and boater needs, participants crafted site-specific measures for hundreds of miles of state waterways. Based on local patterns of manatee use and boat traffic, various types of regulatory measures were applied: channel-inclusive, channel-exempt, and shoreline-only speed zones with differing speed limits, high-speed water sports zones, and, in a few cases at major manatee aggregation sites, no-entry areas. Several rules were challenged in court and in some

cases they had to be renegotiated. Once agreed county rules were adopted, they had to be posted, publicized, in some cases amended, and enforced.

In 1999 the state adopted rules for Lee County, the last of 13 priority counties initially identified in 1989. Although further rulemaking will undoubtedly be needed to refine measures based on new information on manatee mortality and boat traffic patterns, and new rules also may soon be developed for other important counties not initially listed, adoption of the Lee County rules marked a major milestone for the manatee protection program.

The Fish and Wildlife Service also has developed manatee boat speed rules for waterways in several National Wildlife Refuges in Florida. In 1997 the Service also established a new staff position to coordinate and expand enforcement of state and federal boating rules to protect manatees. With strong interest and assistance from the U.S. Coast Guard, the Service has taken an important step to increase law enforcement efforts throughout the state over the past three years. In particular, Service law enforcement officers, in cooperation with the Florida Marine Patrol and the Coast Guard, have organized a series of law enforcement operations in areas where vessel-related manatee mortality has been high and boater compliance has been poor. In 1999 the Service conducted seven 2- to 3-day enforcement operations in Brevard, Volusia, Dade, Collier, and Lee Counties. During these operations, Service law enforcement agents stopped more than 2,500 boats exceeding posted speeds and issued more than 800 citations, each carrying a \$100 fine. The Coast Guard also continued to give particular attention to enforcing manatee-related rules, issuing nearly 700 citations during 1999.

Expanded enforcement of new boat speed rules is one of the highest priorities for the manatee recovery program. As indicated in Table 8, vessel-related manatee mortality has continued to reach new record levels since the first countywide boat speed rules were adopted early in the 1990s. This may be due to low levels of compliance with the new rules, increasing numbers of boats, and limited law enforcement efforts. Even with recently increased efforts by the Service and the Coast Guard, overall enforcement of manatee-related boat speed rules has been lax or

inconsistent in most parts of the state. This is because of the limited number of officers patrolling the thousands of miles of regulated waterways, competing law enforcement demands, and the time needed for enforcement officers, courts, and the boating public to become familiar with the new boating rules. As a result, it is not clear if vessel-related manatee mortality has remained high because boater compliance levels has been low, because of ineffective regulatory measures, or because of some other factor.

Upon learning of the importance of law enforcement for increasing compliance with new boat speed rules, Congress, at the behest of Senator Bob Graham of Florida, took steps early in 1999 to appropriate \$498,000 to the Fish and Wildlife Service to expand manatee law enforcement in fiscal year 2000. Such funding could triple, or perhaps quadruple, the Service's law enforcement capabilities over 1999 levels. Noting that the planned appropriation was as important as it was timely, the Commission wrote to the Service on 16 April 1999 commending its efforts to identify and address enforcement needs with regard to manatees. Observing that the recent accomplishments with regard to increased law enforcement had resulted from the establishment of a law enforcement coordinator position in the Service's Endangered Species Field Office in Jacksonville, Florida, and understanding that the Service was considering a possible change in this position, the Commission urged that the coordinator and his administrative position in the manatee recovery program not be changed. The Service subsequently took no action to change the position during 1999.

The extent to which this additional enforcement will increase compliance rates will require close examination. Both enforcement and studies of boater compliance with the new rules are expected to receive particular attention in efforts to update the Florida Manatee Recovery Plan (see below).

Manatee Entrapment in Water-Control Structures

The second largest source of human-related manatee mortality is entrapment in flood gates and navigation locks. These structures, which are owned and

operated by the South Florida Water Management District, the Army Corps of Engineers, and the Florida Department of Environmental Protection, have been responsible for an average of about 11 manatee deaths per year since 1994 (see Table 8). To prevent such deaths, the District and the Corps have worked cooperatively to develop and install reversing mechanisms, similar to those on elevator doors, to stop flood gate and lock doors from closing on manatees. The District assumed responsibility for designing and testing mechanisms for flood gates, and the Corps took the lead in developing a mechanism for navigation locks.

Flood gates operate by raising and lowering a single door to control the release of drainage water through dredged canals. Individual flood control structures have up to four separate doors. Initial efforts to design a flood gate reversing mechanism used a series of mechanical plungers placed on the edge of gate doors to trigger gate reversals. This proved unsatisfactory because of clogging by debris and maintenance requirements. As an alternative trigger mechanism, the District therefore tested strips of piezoelectric film, a tough plastic material that converts mechanical pressure into electric current. With no moving parts to clog, jam, or rust, a prototype design using piezoelectric strips was installed on two of four gates at a flood control structure in Dade County in July 1997.

Based on promising test results, the Army Corps of Engineers obtained a \$2.7 million appropriation and developed a two-part plan to contract for installing new devices at 20 flood control structures and seven navigation locks. The Commission commented on the proposed plan on 15 September 1997. It urged the Corps to develop contractual arrangements as quickly as possible for installing a standardized design that incorporated any additional design modifications that might be indicated by further testing. By the end of 1997 the District had installed new devices on the remaining two gates at the partially retrofitted structure and at three other structures. Together, the four modified structures had caused nearly 60 percent of all flood gate-related manatee deaths since 1974.

In 1998 the Corps proceeded to develop construction plans and specifications to request bids on work

to retrofit reversing mechanisms on the other key structures. Bid requests were sought during 1999, and at the end of 1999 the Corps was in the process of selecting a contractor. Depending on the number of gates at each flood control structure, the cost of retrofitting the devices is expected to be about \$50,000 to \$200,000 per structure. Pending award of the construction contract, no additional flood gates were retrofitted during 1999. Of the 15 manatees killed in flood gates in 1999, two died at a structure retrofitted with the new reversing mechanisms. Both deaths appear to have been due to an installation flaw when the devices were added. Considering the high number of flood gate-related deaths at the retrofitted structures before the piezo devices were installed, it appears that the new devices have the potential to significantly reduce the number of such deaths.

Progress also has been made by the Corps of Engineers to develop a related device for use on navigation locks. Navigation lock doors open and close like barn doors on hinges attached to the sides of locks. Given the design and water flow characteristics of navigation locks, the Corps investigated a trigger mechanism for locks that involves a vertical series of acoustic beams spaced at 8-inch intervals on one door, and a strip of piezoelectric sensors on the opposing door that convert sound energy from the beams into an electric current. When an object moves between a pair of closing doors, it breaks the acoustic beams and the doors reverse automatically.

Late in 1998 a prototype design was installed at a lock in St. Lucie in southeastern Florida. It appeared to be working properly and steps were taken to contract for installation of the system at a second lock at Cape Canaveral. During 1999 problems developed that appeared to be related to the manner in which the device was installed. As a result, the system was shut down for a few days in August 1999. During that time, a manatee was killed at the lock. The lock was subsequently drained to examine the device and a different method was used to attach the system's components to the lock doors. At the end of 1999 it appeared that the problems had been corrected and steps were taken to install the system at the Cape Canaveral lock. Barring further problems, the Corps anticipated that it would begin action to retrofit the other locks on its list. The estimated cost to retrofit

lock doors with acoustic reversing mechanisms is \$300,000 to \$400,000 per structure.

Updating the Florida Manatee Recovery Plan

As noted above, the Service adopted a revised Florida Manatee Recovery Plan in 1996. That plan was developed by a subcommittee of the Florida Manatee Recovery Team chaired by the Marine Mammal Commission's representative and was submitted to the Service in September 1994. After work to update the plan was completed, the Service took no action to reconvene the team even though the action was called for in the adopted plan. On several occasions, the Commission recommended that the Service convene the team to help coordinate interagency activities and improve communications among recovery plan partners. The Service instead chose to rely on a small group of lead agency officials to coordinate recovery work, and it advised the Commission that it would establish a new recovery team when the time came to update the recovery plan.

The recovery plan adopted by the Service in 1996 covers a five-year period that extends through 2000. In January 1999 the Service invited the Commission and other groups to participate on a new recovery team to help draft a revised recovery plan. The Commission accepted the invitation and the Service convened the new team four times during 1999. Other members of the team include representatives of federal agencies (the Fish and Wildlife Service, the U.S. Geological Survey's Sirenia Project, the Army Corps of Engineers, and the Environmental Protection Agency), state agencies (the Bureau of Protected Species Management, the Florida Marine Research Institute, and the Georgia Department of Natural Resources), environmental organizations (Save the Manatee Club), the research community (Eckerd College and Mote Marine Laboratory), the Florida electric power industry, the boat manufacturing industry, the fishing industry, and the boating public.

During 1999 the team considered ways of developing objective, measurable criteria for defining when Florida manatees should be listed as endangered and threatened under the Endangered Species Act. In the absence of reliable estimates of total population size, the Manatee Population Status Working Group, a

group convened pursuant to a task in the 1996 Recovery Plan and which includes manatee scientists with the Sirenia Project and the State of Florida, recommended that the team base recovery plan goals for down-listing and delisting manatees on analyses of manatee survivorship and reproduction rates derived from resighting records of individually identified manatees. The team also began developing advice on specific tasks to be included in the plan. At the end of 1999 the Service anticipated receiving a completed draft plan from the team during 2000.

The Manatee Technical Advisory Council

In the early 1980s the Florida Department of Natural Resources, the state agency then responsible for state activities related to manatee conservation, established a Manatee Technical Advisory Council. The Council, composed of independent experts on manatees, was charged with providing the Executive Director of the Department with advice and recommendations on actions that the Department should take to help protect manatees. To help with the cost of convening the Council, the Marine Mammal Commission provided funds to the Department that covered the first few years of the Council's operations.

Over the years the Council has provided a valuable forum for discussing manatee conservation issues and has become a respected source of advice on priority activities. When responsibility for the state's manatee program was shifted from the Department of Natural Resources to the Florida Department of Environmental Protection in 1993, the Executive Director of the latter agency continued support for the Council. Among its accomplishments was a comprehensive review of the state's manatee conservation program completed in 1997.

As noted above, responsibility for the state's manatee conservation program again shifted in 1999 from the Florida Department of Environmental Protection to the new Florida Fish and Wildlife Conservation Commission. In light of the Council's important contributions and role in helping guide the state manatee recovery program, the Commission wrote to the Executive Director of the new state Commission on 17 September 1999 urging that it continue to support regular meetings of the Council.

On 22 September 1999 the State Commission's Executive Director replied noting that funds would be provided to extend Council operations for another year during the transition of manatee management to the new Commission. After that period, he noted that a long-term decision would be made.

Litigation

On 20 May 1999 the Save the Manatee Club and 21 other environmental organizations filed a 60-day notice of intent to sue the Fish and Wildlife Service and the Army Corps of Engineers for alleged violations of three federal statutes bearing on the protection of Florida manatees. The notice alleged that the Service had violated section 4(f) of the Endangered Species Act, which provides for the development of recovery plans. The notice stated that the recovery plan adopted by the Service for Florida manatees lacked required criteria for listing and delisting manatees on the endangered species list and that it provided insufficient guidance with regard to identifying needed recovery actions. It also claimed the Service was not adequately implementing recovery measures that were included in the adopted plan. The notice also alleged that the Service had violated section 7 of the Act, which addresses consultation requirements with federal agencies, by preparing inadequate biological opinions on Corps' permits for hundreds of development projects, such as those for marinas and boating facilities, that involve dredging and filling manatee habitat. In part, it claimed that the Service's opinions concluding that manatees would not be jeopardized by these projects were unsupported and incorrect, and that they failed to adequately consider cumulative impacts of coastal development and boat traffic on manatees and their critical habitat.

The notice also alleged that the Corps had violated the Endangered Species Act. It claimed that the Corps had failed to comply with section 9 of the Act, which prohibits federal actions that are likely to result in the death or injury of endangered species. By issuing permits for marina developments that have in turn increased vessel traffic on waterways used by manatees, the notice stated that the Corps had plainly contributed to increased vessel-related manatee mortality and injury. It also alleged that the cumulative effects of Corps-permitted projects had seriously

degraded critical habitat for manatees and thereby violated section 7(a)(2), which requires federal agencies to act in a manner that will not jeopardize the continued existence of a listed species or adversely modify its critical habitat. Regarding the Marine Mammal Protection Act, the notice claimed that the Corps had failed to comply with the Act's moratorium on taking marine mammals and that it had not obtained a small-take authorization under section 101(a)(5) to allow incidental taking of manatees under the Corps' Clean Water Act permit program.

Finally, the notice alleged that both the Service and the Corps had violated provisions of the National Environmental Policy Act by failing to prepare environmental impact statements and environmental assessments on the cumulative, incremental effects of actions leading to the authorization of hundreds of development projects in essential manatee habitat.

To resolve the alleged violations, the notice called on the Service to develop objective measurable criteria for listing and delisting manatees under the Endangered Species Act and to implement provisions of the Florida Manatee Recovery Plan. In part, it called on the Service, in coordination with state agencies and the Corps, to ensure that existing boat speed regulatory zones are implemented effectively and that new ones are adopted; create a comprehensive network of manatee sanctuaries and reserves; develop a contingency plan to address problems associated with the future availability of artificial warm-water refuges for manatees; identify steps necessary to maintain minimum flow rates at natural warm-water springs used by manatees; and issue biological opinions with jeopardy findings when reviewing any project that has the effect of increasing boat traffic in manatee habitat. The notice also called on the Corps to suspend permitting of coastal development projects that could increase boat traffic or degrade essential habitat.

Representatives of the groups filing the notice subsequently met with staff members of the Service and the Corps to try to resolve these and related issues identified in the notice. However, agreement could not be reached on all of the points and, at the end of 1999, it was expected that a suit would be filed.

Chapter IV

MARINE MAMMAL-FISHERIES INTERACTIONS

Marine mammals may be disturbed, harassed, injured, or killed either accidentally or deliberately during fishing operations. They, in turn, may take or damage bait and fish caught on lines, in traps, and in nets, damage or destroy fishing gear, or injure fishermen trying to remove them from fishing gear. Marine mammals and fishermen also may compete for the same fish and shellfish resources.

In 1994 the Marine Mammal Protection Act was amended to establish a new regime to govern the taking of marine mammals incidental to commercial fishing operations. As in the past, however, the incidental take of dolphins in the eastern tropical Pacific tuna fishery continues to be regulated under separate provisions of the Act. Implementation of the 1994 fisheries regime is discussed in this chapter. Also discussed are amendments to the Marine Mammal Protection Act enacted in 1997 pertaining to the eastern tropical Pacific tuna fishery and actions being taken to implement those amendments. In addition, this chapter provides information on efforts to address interactions between various species of pinnipeds and certain fish stocks. Fishery interactions affecting specific species, including Hawaiian monk seals, Steller sea lions, sea otters, harbor porpoises, and right whales, are discussed in Chapter III.

Implementation of the Incidental-Take Regime for Commercial Fisheries

Since its enactment in 1972 the Marine Mammal Protection Act has contained provisions for authorizing the taking of marine mammals incidental to commercial fishing operations. The 1987 ruling in a lawsuit challenging an incidental-take permit issued to Japanese salmon fishermen operating in U.S. waters

(*Kokechik Fishermen's Association v. Secretary of Commerce*), however, threw into question whether such permits could continue to be issued under then-existing provisions to many other fisheries known to take marine mammals. In response, Congress passed a five-year interim exemption to govern taking incidental to commercial fishing operations, during which time a new long-term incidental-take regime was to be developed. Efforts to design the new regime, including the development of recommended guidelines by the Commission, are discussed in past annual reports.

These efforts led to amendment of the Marine Mammal Protection Act in 1994 to establish a new regime to govern the taking of marine mammals incidental to commercial fishing operations. Three new sections (sections 117, 118, and 120) were added to the Act to address interactions between commercial fisheries and marine mammals.

Section 117 requires the preparation of marine mammal stock assessments to provide a scientific basis for the new incidental-take regime. In part, the assessments are intended to identify strategic stocks for which take reduction plans must be prepared. Strategic stocks are those that (a) have a level of direct human-caused mortality exceeding the calculated potential biological removal level, (b) are designated as depleted under the Marine Mammal Protection Act, (c) are listed as endangered or threatened under the Endangered Species Act, or (d) are likely to be listed as endangered or threatened in the foreseeable future.

Section 118 sets forth the requirements of the 1994 incidental-take regime. It directs the National Marine Fisheries Service to publish a list of commercial fisheries classified into three categories according to the frequency with which they kill or seriously injure marine mammals. Certain requirements (*e.g.*, a

registration requirement and a requirement to carry observers) are applicable, depending on a fishery's classification. The amendments focus resources on the most pressing problems — those involving strategic stocks. A take reduction plan is to be developed for each strategic stock subject to frequent or occasional mortality or serious injury.

Section 120 addresses interactions between pinnipeds and fishery resources. It provides a mechanism for states to apply to the National Marine Fisheries Service to obtain authorization to lethally take pinnipeds in certain instances. Section 120 also directs the Service to investigate the impacts of growing sea lion and harbor seal populations on the recovery of salmonid stocks and on coastal ecosystems in Washington, Oregon, and California, and to establish a task force to examine problems involving pinnipeds and aquaculture projects in the Gulf of Maine.

The new regime includes a mechanism for authorizing a limited incidental take of marine mammals listed as endangered or threatened under the Endangered Species Act, something the original statute and the interim exemption did not provide. Such authorizations may be issued under section 101(a)(5)(E), provided the National Marine Fisheries Service (or the Fish and Wildlife Service for manatees and southern sea otters) determines that (1) the incidental mortality and serious injury will have a negligible impact on the species or stock, (2) a recovery plan has been or is being developed under the Endangered Species Act, and (3) if required, a monitoring program for relevant fisheries has been established under section 118.

Actions involving the preparation of stock assessments and take reduction plans are discussed in this section and, as they relate to specific marine mammal stocks, in Chapter III. Implementation of the other requirements of section 118 and provisions applicable to endangered and threatened species and deterring marine mammals from damaging fishing gear or catch are also discussed in this section. Actions taken under section 120 are discussed in the section on pinniped-fisheries interactions later in this chapter.

Stock Assessments

Section 117 of the Marine Mammal Protection Act requires the Secretaries of Commerce and the Interior to prepare and periodically update stock assessment reports for each marine mammal stock that occurs in U.S. waters. This provision also requires that three regional scientific review groups be established to assist in the development of these reports. These groups were established in 1994 for Alaska, the Pacific coast, including Hawaii, and the Atlantic coast, including the Gulf of Mexico. They include experts in marine mammal biology, commercial fishing technology and practices, and, in the case of Alaska, Native subsistence uses. Among other things, scientific review groups are to advise the Secretaries on (1) the estimated size, status, and trends of marine mammal stocks, (2) uncertainties and research needs regarding stock separation, abundance, and trends, (3) research on modifications in fishing gear and practices to reduce the incidental mortality and serious injury of marine mammals, and (4) potential impacts of habitat destruction on marine mammals and, for strategic stocks, conservation measures to reduce such impacts.

Based on the advice of the scientific review groups and public comment on draft stock assessments, the Secretaries are to publish a final assessment report for each stock. The Act directs that each assessment:

- describe the geographic range of the stock;
- provide a minimum population estimate, the stock's current and maximum net productivity rates, and current population trend, including the basis for those findings;
- 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 of the stock;
- describe the commercial fisheries that interact with the stock, including estimates of fishery-specific mortality and serious injury levels and rates, a description of seasonal or area differences in incidental take, and an analysis of whether incidental-take levels are approaching a zero mortality and serious injury rate;
- assess whether the level of human-caused mortality and serious injury would cause the stock to be

reduced below its optimum sustainable population level or, alternatively, whether the stock should be categorized as a strategic stock; and

- estimate the potential biological removal level for the stock.

As defined in the Act, a stock's potential biological removal level is the maximum number of animals, not including natural mortality, that can be removed from the stock while allowing it to reach or remain at its optimum sustainable population level. The potential biological removal level is calculated by multiplying three variables — the stock's minimum population estimate, one-half of its theoretical or estimated maximum net productivity rate at a small population size, and a recovery factor of between 0.1 and 1.0.

National Marine Fisheries Service — As discussed in previous annual reports, the National Marine Fisheries Service published its original stock assessment reports in 1995. The Service also published a separate report describing the guidelines used to identify stocks, determine minimum population sizes, estimate maximum net productivity rates, and select appropriate recovery factors. Of 145 stocks for which the Service originally prepared assessments, 47 were determined to be strategic stocks. The Service also designated as strategic 33 localized stocks of bottlenose dolphins that inhabit bays, sounds, and estuaries in the Gulf of Mexico after concluding that the minimum abundance estimates for these stocks were so low that the take of a single animal from most would exceed the calculated potential biological removal level.

Assessments for strategic stocks are to be reviewed at least annually. For other stocks, assessments must be reviewed at least once every three years. The National Marine Fisheries Service published a *Federal Register* notice in July 1998 announcing the availability of those draft stock assessment reports it intended to revise in 1998. The Marine Mammal Commission provided comments on these draft stock assessment reports by letter of 21 October 1998. In general, the Commission believed that the draft reports provided thorough descriptions and assessments of marine mammal stocks occurring in U.S. waters and accurate information on the levels of human-caused mortality and serious injury affecting the stocks. The Commis-

sion noted the absence of draft revisions to the assessment for Hawaiian monk seals and suggested that, in light of the extreme condition of this species and its continuing decline at French Frigate Shoals, an updated assessment for this species be prepared. Similarly, the Commission believed that a revised assessment should be prepared for the western North Atlantic coastal stock of bottlenose dolphins. Comments on individual assessments also were provided.

The National Marine Fisheries Service announced the availability of the final stock assessments for 1998 in the *Federal Register* on 19 February 1999. Of the 31 assessments for Atlantic species, 27 were revised, most by updating abundance or mortality estimates. The Service had not completed reviewing the assessments for stocks in the Gulf of Mexico in 1998 and no changes for those stocks had been proposed.

The report for the western North Atlantic stock of white-sided dolphins changed the status of the stock from non-strategic to strategic, based primarily on the level of incidental mortality in the New England sink gillnet and North Atlantic bottom trawl fisheries. The assessment for the western North Atlantic stock of pygmy sperm whales indicated that the stock is no longer considered to be strategic, inasmuch as no fishery-related mortalities or serious injuries had been observed between 1992 and 1996. Although the assessment for the western North Atlantic coastal stock of bottlenose dolphins was not updated, the status of this stock was extensively reviewed by the Atlantic Scientific Review Group. The Service expected to propose revisions to the assessment for this stock in 1999.

Revisions were made to the assessments for seven stocks that occur along the coasts of California, Oregon, and Washington. In light of revised abundance estimates resulting from a 1996 ship-based survey, the revised assessments found that the stocks of minke whales and mesoplodont beaked whales (*Mesoplodon* spp.) that occur in this area should be reclassified as non-strategic. Although no revisions were made to the assessments for stocks occurring in Hawaiian waters, the Service indicated in its 19 February 1999 *Federal Register* notice that a revised stock assessment for Hawaiian monk seals would be made available for review in 1999.

Of 33 marine mammal stocks under National Marine Fisheries Service jurisdiction that occur in Alaska, the Service published revised assessments for 13. None of those revisions, however, resulted in changing the status of any of these stocks.

The National Marine Fisheries Service published a *Federal Register* notice on 28 May 1999 announcing the availability of draft revised stock assessment reports for 1999. The Service proposed revisions to the reports for 31 of the 60 marine mammal stocks that occur along the Atlantic coast and in the Gulf of Mexico. Stock definitions for sei whales, and gray, harp, and hooded seals were revised to conform to those used by international scientific bodies. Based on new information concerning annual fishery-related mortality, the draft assessments proposed status changes for three western North Atlantic stocks, the Atlantic spotted dolphin, the pantropical spotted dolphin, and the dwarf sperm whale. Inasmuch as the average annual incidental mortality for these stocks between 1993 and 1997 was less than the calculated potential biological removal levels, the Service indicated its intent to change their status from strategic to non-strategic. Based on a revised estimate of fishery-related mortality for pilot whales, the Service proposed a status change for the western North Atlantic stock of long-finned pilot whales to strategic.

Draft revised stock assessments were prepared for 11 Pacific stocks, including the Hawaiian monk seal. No status changes were proposed in any of the revised reports. One notable change was the proposed division of the California/Oregon/Washington killer whale stock into two other stocks. Part of this stock would be merged with the pre-existing eastern North Pacific transient stock. This stock, which had been listed as an Alaskan stock, would now be considered to be a Pacific stock. The remainder would be placed in a separate stock, the eastern North Pacific offshore stock, which would include killer whales ranging from Alaska to California.

The Service proposed revisions to 13 of the 33 Alaska stock assessments, primarily to reflect new abundance or mortality estimates. As discussed in Chapter III, the minimum population estimate for the Cook Inlet stock of beluga whales was revised dramatically downward, resulting in a reduction of the

potential biological removal level calculated for this stock from 14 to less than 3.

Final stock assessments for 1999 had been completed but not yet published by the National Marine Fisheries Service as of the end of the year. They are expected to be available early in 2000.

Fish and Wildlife Service — The Fish and Wildlife Service published initial assessment reports for the eight stocks of marine mammals under its jurisdiction on 4 October 1995. Three stocks, the Florida and Antillean stocks of the endangered West Indian manatee and the threatened California stock of sea otters, were determined to be strategic stocks.

As discussed in previous annual reports, the Fish and Wildlife Service issued draft revised stock assessments for southern sea otters in California, northern sea otters in Washington, and the Florida and Antillean stocks of West Indian manatees in April 1997. Although the draft revisions incorporated information not available when the original assessment reports were prepared, no changes in the status of these stocks were proposed. The final reports for these stocks were never published, and they have not been updated since that time.

In September 1998 the Fish and Wildlife Service published updated assessment reports for the stocks of polar bears and walrus that occur in Alaska. These stocks remained classified as non-strategic.

Although the Service published a draft assessment for Alaska sea otters earlier in 1998, issuance of a final report was deferred. The draft report had proposed splitting Alaska sea otters, previously considered to be a single stock, into three separate stocks based on genetic studies and other information. In response, the Alaska Sea Otter and Steller Sea Lion Commission, which represents Alaska Natives who hunt sea otters and which opposed the proposed division of Alaska sea otters into three stocks, requested that the Service conduct a proceeding on the record before finalizing the report. Under section 117 of the Marine Mammal Protection Act, an Alaska Native subsistence hunter has a right to request such a hearing before a final stock assessment can be pub-

lished for any marine mammal stock taken in Alaska for subsistence or handicraft purposes.

As discussed in the sea otter section of Chapter III and in last year's annual report, the Fish and Wildlife Service initiated consultations with the Alaska Sea Otter and Steller Sea Lion Commission in an effort to resolve the issue of stock structure without resorting to a formal hearing. These consultations resulted in the development of a memorandum of agreement, under which the Commission withdrew its request for a hearing and the Service agreed to work with the Commission to obtain additional information on sea otter stock structure in Alaska and to make a final determination on the issue by 1 March 2000.

The Incidental-Take Regime

Section 118 of the Marine Mammal Protection Act sets forth the regime governing the take of marine mammals incidental to most commercial fishing operations. It requires classification of all U.S. fisheries according to the frequency with which marine mammals are taken, registration by fishermen participating in fisheries that frequently or occasionally take marine mammals, monitoring and reporting of incidental taking, and attainment of the goal of reducing incidental mortality and serious injury of marine mammals in commercial fisheries to insignificant levels approaching zero within seven years. The section also requires the preparation of a take reduction plan for each strategic stock subject to frequent or occasional mortality or serious injury in fishing operations. Each plan is to include recommended regulatory or voluntary measures to reduce incidental mortality and serious injury and recommend dates for achieving specific objectives. The immediate goal of the plans 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 plans 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.

Implementing Regulations — As discussed in greater detail in previous annual reports, the National

Marine Fisheries Service published regulations implementing section 118 on 30 August 1995. Among other things, the regulations include procedures for vessel owners to register for an authorization certificate, observer and reporting requirements, and criteria for classifying fisheries. Along with its final list of fisheries for 1999, the Service published minor changes to these regulations on 24 February 1999.

Although the original proposed rule published by the Service in 1994 included a proposed definition to be used to determine when the zero mortality and serious injury rate goal of the Act had been achieved, this element of the regulations has never been finalized. As such, this one issue remains unresolved.

The 1994 amendments require that commercial fisheries reduce incidental mortality and serious injury of marine mammals to insignificant levels approaching a zero mortality and serious injury rate by April 2001. Toward this end, the amendments require the National Marine Fisheries Service to review the progress of commercial fisheries in meeting this goal and to report its findings to Congress. The report was to have been submitted by 30 April 1998. As of the end of 1999, however, completion of the report was awaiting resolution by the Service of how best to quantify the phrase "approaching a zero mortality and serious injury rate." The Service expects to settle this issue and submit its report to Congress in 2000.

Several provisions of the incidental-take regime for commercial fisheries are aimed at reducing marine mammal mortalities and serious injuries to certain levels. As such, it is important that there be some mechanism for differentiating between serious and non-serious injuries. Regulations promulgated by the Service in 1995 define serious injury as any injury that will likely result in the mortality of a marine mammal. However, it is not always apparent at the time a marine mammal is released from fishing gear whether its injuries are life-threatening. To address this issue, the Service convened a workshop in April 1997 to consider ways to determine what injuries are to be considered serious. Representatives of the Marine Mammal Commission participated in the workshop.

The workshop report, published in January 1998, identified the different ways in which marine mammals may be injured by various types of fishing gear and assessed the likelihood that different types of marine mammals would survive such injuries. The report also recognized that some marine mammals may succumb from the physiological effects of stress associated with entanglement in fishing gear. In addition, it summarized the participants' views concerning the types of information that should be collected by observers to enable the Service to determine which injuries should be considered serious.

The workshop report included general guidelines for determining when injuries should be considered serious. For large whales, participants generally agreed that any entanglement that resulted in the animal trailing gear such that its mobility or ability to feed was impeded should be considered a serious injury. For small cetaceans, animals that ingest hooks, are trailing gear when released, or swim away abnormally after being released should be considered seriously injured. For pinnipeds, animals should be considered seriously injured if they are trailing gear or are hooked in the mouth. The Service intends to draw on the findings of the workshop to develop guidelines for determining what constitutes a serious injury. The Service expects to circulate draft guidelines for public review and comment during 2000.

Take of Endangered and Threatened Species — As noted above, the incidental-take regime enacted in 1994 includes a provision for authorizing the incidental taking of species listed as endangered or threatened, provided certain findings are made. In 1996 three-year permits were issued to participants in Alaska fisheries, authorizing the incidental taking of North Pacific humpback whales and Steller sea lions from both the eastern and western stocks. Those authorizations were to expire on 31 December 1998. On 30 December 1998, however, the National Marine Fisheries Service published a *Federal Register* notice extending those permits through 30 June 1999. Rather than reissue the permits for a three-year period, the Service chose to extend them for six months while it reviewed its criteria for determining whether authorized taking will have a negligible impact on listed marine mammal stocks.

The National Marine Fisheries Service published a *Federal Register* notice on 27 May 1999 proposing to issue three-year permits authorizing the taking of five stocks of endangered and threatened marine mammals incidental to several category I and II fisheries, based on revised criteria for making negligible impact determinations. Under these criteria, the threshold for making a finding of negligible impact would remain at 10 percent of a stock's potential biological removal level. Under this standard, if the number of human-related serious injuries and mortalities were less than 10 percent of the calculated potential biological removal level, incidental taking in all fisheries would be permitted. If the number of serious injuries and mortalities from all human-related causes exceeded this level, incidental taking could still be authorized if fishery-related mortality was less than 10 percent of the stock's potential biological removal level, provided that management measures were being taken to address the other sources of serious injuries and mortalities. In situations where the number of fishery-related serious injuries and mortalities is between 10 and 100 percent of a stock's potential biological removal level, and the stock is stable or increasing, the Service would review information for individual fisheries and make determinations on a case-by-case basis. For stocks that are declining, incidental-take permits would be issued only if the level of human-related mortality and serious injury was less than 10 percent of the stock's potential biological removal level. No incidental-take permits would be issued for any stock for which the total number of fishery-related serious injuries and mortalities exceeds the stock's potential biological removal level.

Using these criteria, the Service determined that no incidental taking could be authorized from the California-Oregon-Washington-Mexico stock of humpback whales, the western North Atlantic stock of right whales, the California/Oregon/Washington and North Pacific stocks of sperm whales, or the Hawaiian monk seal. Stocks for which the issuance of incidental-take permits were proposed included the western North Atlantic stock of fin whales, the central North Pacific and North Atlantic stocks of humpback whales, and the eastern and western stocks of Steller sea lions. The Service determined that no taking authorization was needed for the 14 other marine mammal stocks listed as endangered or threatened, inasmuch as there

had been no documented fishery-related serious injuries or mortalities from these stocks.

The Commission commented on the Service's 27 May notice by letter of 30 July 1999. That letter apparently was lost in the mail and a copy was provided to the Service in January 2000. The Commission noted that, because all endangered and threatened species are strategic stocks, one of the statutory requirements for issuing an incidental take permit under section 101(a)(5)(E) is that a take reduction plan has been or is being developed for the species or stock. The Commission explained that, in its view, preparing such plans for all listed species was not a wise use of agency resources. The Commission therefore urged the Service to seek an amendment to the Marine Mammal Protection Act that would eliminate the requirement to prepare a take reduction plan for those strategic stocks for which fishery-related mortality and serious injury are determined to be inconsequential.

While generally supportive of establishing 10 percent of a stock's potential biological removal level as a threshold for determining when fishery-related mortalities and serious injuries from listed species should be considered negligible, the Commission cautioned that this might not be an appropriate standard for a stock that is declining despite the fact that known human-caused injuries and mortalities are only a small fraction of its potential biological removal level. Authorizing incidental taking in such cases may serve to hasten the decline and may not be negligible. Related to this point, the Commission noted that the *Federal Register* notice did not explain how the Service intended to attribute and quantify indirect adverse effects of human activities, such as the possible localized depletion of prey species on the declining western stock of Steller sea lions. The Commission recommended that the Service discuss whether and how indirect human-related effects will be factored into negligible impact determinations.

The Commission also found the Service's criterion for making negligible impact determinations for declining stocks to be confusing and believed that clarification was needed. Further, the Commission questioned the appropriateness of using blanket numerical criteria to make findings for declining stocks.

The Commission generally agreed with the fisheries identified by the Service as meeting the criteria for obtaining incidental take permits under section 101(a)(5)(E). However, consistent with its general comments concerning declining stocks, the Commission questioned the inclusion of fisheries that take Steller sea lions from the western stock. Inasmuch as this stock continues to decline for undetermined reasons, the Commission thought that additional discussion of the Service's rationale for believing existing levels of fisheries-related taking to be negligible was needed before any taking could be authorized.

As of the end of 1999 the Service had yet to issue new permits authorizing the taking of endangered and threatened marine mammals incidental to commercial fishing operations.

List of Fisheries — A key feature of the incidental-take regime is annual publication of a list of fisheries placing each U.S. fishery into one of three categories based on the frequency with which marine mammals are killed or seriously injured. Vessel owners participating in category I or category II fisheries must register and are subject to certain other requirements. Those participating in category III fisheries need not register for an incidental-take authorization, but are required to report any marine mammal mortality or injury that occurs incidental to their operations.

Under regulations published by the National Marine Fisheries Service, a category I fishery is one in which annual mortality and serious injury of animals from any marine mammal stock are equal to or greater than 50 percent of the stock's potential biological removal level. A category II fishery is one in which annual mortality and serious injury are between 1 and 50 percent of the stock's potential biological removal level, provided that the total number of mortalities and serious injuries from all fisheries combined is greater than 10 percent of the stock's potential biological removal level. All other fisheries (*i.e.*, those which, combined with other fisheries, do not take more than 10 percent of a stock's potential biological removal level or that individually take less than one percent of any stock's potential biological removal level) are placed in category III.

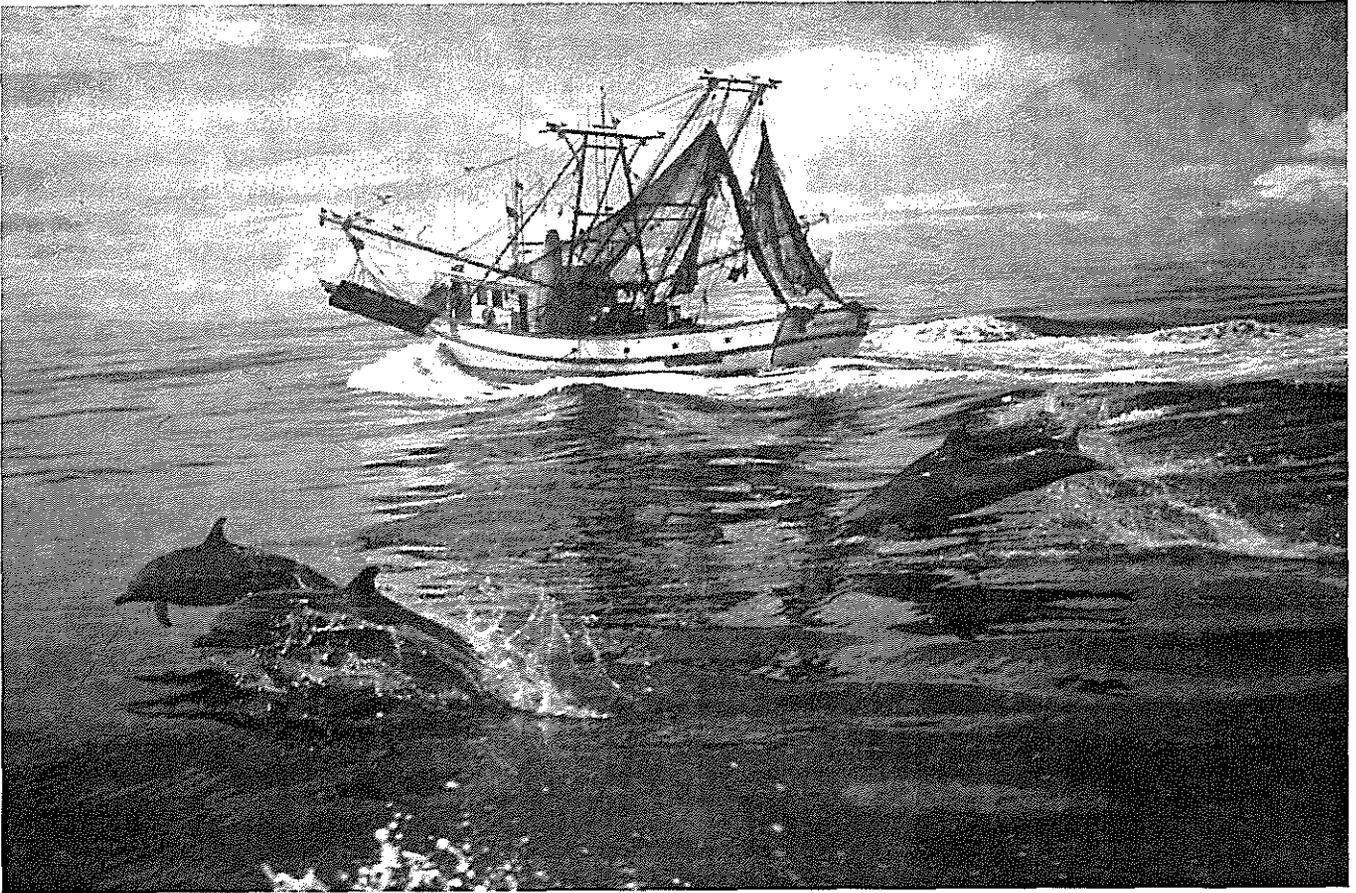


Figure 11. Spotted dolphins (*Stenella attenuata*) with fishing boat in the eastern Pacific Ocean.
(Photograph © Bill Curtsinger)

The Service published its final list of fisheries for 1999 on 24 February 1999. The list included 6 category I fisheries, 26 category II fisheries, and 155 category III fisheries. The most significant changes from the 1998 list involved two fisheries, one in the Atlantic and one in the Gulf of Mexico. The Gulf of Mexico menhaden purse seine fishery was listed as a category II, rather than a category III fishery, based on the estimated number of bottlenose dolphin mortalities incidental to this fishery. Although the level of take may warrant listing this fishery in category I, the Service chose to place it in category II pending a revised analysis of the stock structure of bottlenose dolphins in the Gulf of Mexico. The Atlantic herring midwater trawl fishery was added to the list of fisheries as a category II fishery. This listing includes the

mid-Atlantic coastal herring trawl fishery, previously listed separately as a category III fishery. Numerous other changes were incorporated into the 1999 list of fisheries to refine the description of certain fisheries and to update information on the numbers of vessels or persons participating in the fisheries and on the species taken.

No changes to the 1999 list have been proposed by the Service for 2000.

Take Reduction Plans — As noted above, section 118 requires the National Marine Fisheries Service to develop a take reduction plan for each strategic stock that interacts with a fishery that frequently or occasionally kills or seriously injures marine mammals

(i.e., a category I or category II fishery). It directs the Service to establish take reduction teams to take the lead in developing take reduction plans. These teams are to include members representing federal agencies, affected coastal states, appropriate fishery management councils, interstate fishery commissions, academic and scientific organizations, environmental groups, the commercial and recreational fishermen that incidentally take the species or stock, and any affected Alaska Native or Indian tribal organizations.

Where human-caused mortality and serious injury of a stock are believed to be equal to or greater than the stock's potential biological removal level, a take reduction team is to prepare and submit to the Service a draft take reduction plan within six months of the team's establishment. For other strategic stocks, draft take reduction plans are to be submitted within 11 months of the team's establishment. Within 60 days of receiving a draft take reduction plan, the Service is to publish the plan in the *Federal Register*, along with any proposed changes and proposed regulations to implement the plan, for public review and comment. After a public comment period of no more than 90 days, the Service has 60 days in which to publish a final take reduction plan and implementing regulations. After publication of the final plan, take reduction teams are to continue to meet to monitor the plan's implementation.

As discussed in previous annual reports, the National Marine Fisheries Service has established five take reduction teams, the Gulf of Maine Harbor Porpoise Take Reduction Team, the Pacific Offshore Cetacean Take Reduction Team, the Atlantic Offshore Cetacean Take Reduction Team, the Atlantic Large Whale Take Reduction Team, and the Mid-Atlantic Coastal Gillnet Take Reduction Team. A representative of the Commission has participated as a member of the Gulf of Maine harbor porpoise and Atlantic large whale teams.

Activities of the Gulf of Maine Harbor Porpoise Take Reduction Team and the Mid-Atlantic Coastal Gillnet Take Reduction Team are discussed in the Gulf of Maine harbor porpoise section of Chapter III. Actions by the Service and the Atlantic Large Whale Take Reduction Team to adopt and implement a take reduction plan for endangered whales along the

Atlantic coast taken in coastal gillnet and lobster pot fisheries are discussed in the northern right whale section of Chapter III.

The Pacific Offshore Cetacean Take Reduction Team was constituted to address the incidental take of several species of beaked whales, short-finned pilot whales, pygmy sperm whales, sperm whales, and humpback whales in the category I drift gillnet fishery targeting thresher sharks and swordfish in waters off California and Oregon. As discussed in the previous annual report, the National Marine Fisheries Service, based on recommendations from the team, published regulations in 1997 requiring that nets be set a minimum of 36 feet (11 m) below the water surface, low-intensity acoustic deterrent devices (pingers) be used on nets, and operators in the fishery attend a skipper education workshop before each fishing season. As reported last year, implementation of these measures resulted in reducing marine mammal mortality during the 1997-1998 fishing season by approximately 65 percent. The overall level of marine mammal mortality again declined during the 1998-1999 fishing season, although one sperm whale was reported killed. Apparently this mortality occurred in a set in which the required number of pingers had not been deployed. Data concerning incidental mortality and serious injuries for the 1999-2000 season were not yet available as of the end of 1999.

Under the 1997 regulations, operators in the covered fisheries were required to attach pingers on or near the floatline and leadline of their nets at specified intervals. Attaching and removing pingers at the specified locations, however, proved inefficient and, in some instances, required that net reels be slowed or stopped. The National Marine Fisheries Service, in response to a request from affected fishermen, and after determining that alternative placement should be effective in reducing cetacean bycatch, published amended regulations on 22 January 1999. The amendment, which allows pingers to be attached on longer lanyards, was consistent with a recommendation made by the Pacific Offshore Cetacean Take Reduction Team in 1998.

The Atlantic Offshore Cetacean Take Reduction Team was established in 1996 to address the take of several species of cetaceans, including right whales,

humpback whales, sperm whales, beaked whales, long-finned and short-finned pilot whales, and common, spotted, and bottlenose dolphins, incidental to operation of the Atlantic pair trawl, longline, and drift gillnet fisheries for swordfish and other species. The team submitted a draft take reduction plan to the National Marine Fisheries Service in November 1996. The team recommended seasonal closures, increased observer coverage, limits on expansion of the fishery, and allocation of catch limits over a longer season.

Before finalizing its take reduction plan, the Service published a proposed rule to prohibit permanently the use of driftnets in the Atlantic swordfish fishery. In making this proposal, the Service noted that measures recommended by the Atlantic Offshore Cetacean Take Reduction Team did not provide sufficient guarantees that marine mammal takes would be reduced to allowable levels and did not adequately address concerns about the bycatch of sea turtles. The Service also noted that the cost of implementing the take reduction team's recommendations would exceed the net value of swordfish landings. Final rules to implement the driftnet closure were issued on 27 January 1999. In light of changes in the fisheries, the Service intends to reconstitute the take reduction team to consider additional measures to reduce marine mammal mortalities and serious injuries in the remaining offshore fisheries.

Intentional Taking — Unlike the interim exemption that governed incidental taking between 1988 and 1995, the regime established under section 118 prohibits intentional lethal taking of marine mammals in commercial fishing operations. The only exception is if lethal taking is "imminently necessary in self-defense or to save the life of another person in immediate danger."

Although intentional lethal take is not allowed, fishermen and others may take marine mammals by non-lethal means to deter them from damaging gear, catch, or other property under certain circumstances. Section 101(a)(4) of the Marine Mammal Protection Act directs the National Marine Fisheries Service and the Fish and Wildlife Service to publish a list of guidelines to govern measures for safely deterring marine mammals. In the case of marine mammals listed as endangered or threatened, the Services are to

recommend specific measures that can be used to deter the animals non-lethally. The use of certain deterrence measures that have a significant adverse effect on marine mammals may be prohibited.

The National Marine Fisheries Service published proposed deterrence regulations on 5 May 1995. The Service offered guidance on passive, preventive, and reactive measures that could be taken to deter marine mammals, setting forth four general principles regarding acceptable deterrence measures. In addition to a statutory directive that such measures not result in the death or serious injury of the animal, the measures should not (1) result in the separation of a female marine mammal from its unweaned offspring, (2) break the skin of a marine mammal, (3) be directed at a marine mammal's head or eyes, or (4) be used to deter pinnipeds hauled out on unimproved private property. The Service also proposed to prohibit the use of any firearm or other device to propel an object that could injure a marine mammal, the use of any explosive device to deter cetaceans or the use of explosives more powerful than seal bombs to deter seals or sea lions, translocation of any marine mammal, or the use of tainted food or bait or any other substance intended for consumption by the marine mammal. Deterrence of marine mammals listed as endangered or threatened under the Endangered Species Act would not be authorized under the proposed regulations. Rather, measures to safely deter listed species would be subject to a separate rule-making. Commission comments on the proposed regulations are summarized in the 1995 annual report.

As of the end of 1999 final deterrence regulations had yet to be published by the National Marine Fisheries Service. The Fish and Wildlife Service had not published any guidelines or proposed regulations with respect to deterrence of those species of marine mammals under its jurisdiction.

The Tuna-Dolphin Issue

For reasons not fully understood, schools of large yellowfin tuna (those greater than 25 kg or 55 pounds) tend to associate with dolphin schools in the eastern tropical Pacific Ocean. This area covers more than 5

million square miles (18.1 million km²) stretching from southern California to Chile and westward to Hawaii. Late in the 1950s U.S. fishermen began to exploit this association by deploying large purse seine nets around dolphin schools to catch the tuna swimming below. Despite efforts by fishermen to release the dolphins unharmed, some animals become trapped in the nets and are killed or injured. Estimated dolphin mortality in the early years of the fishery were in the hundreds of thousands per year. Efforts to reduce the incidental mortality of dolphins in this fishery have been a primary focus of the Marine Mammal Protection Act since it was enacted in 1972.

Background

The eastern tropical Pacific tuna fishery was dominated by U.S. vessels during the 1960s and early 1970s. In the late 1970s and early 1980s the U.S. fleet declined and the number of foreign vessels participating in the fishery grew. Along with these shifts in the fishery came changes in the associated dolphin mortality. As reflected by mortality data presented in Table 9, progress made by the United States to reduce dolphin mortality under the Marine Mammal Protection Act was offset by increased mortality from growing foreign operations. This prompted Congress to amend the Marine Mammal Protection Act in 1984 and again in 1988 to establish comparability requirements for nations seeking to export tuna to the United States. Imports of yellowfin tuna caught in the eastern tropical Pacific were banned from countries that failed to adopt a tuna-dolphin program comparable to that of the United States or whose fleet exceeded the incidental-take rate of the U.S. fleet by a certain amount. In addition, imports of yellowfin tuna from intermediary nations that imported tuna from nations subject to a primary embargo were made subject to a secondary embargo. Additional requirements also were placed on U.S. tuna fishermen.

The 1988 amendments and the resulting threat of tuna embargoes brought about substantially reduced dolphin mortality by foreign fleets. Another factor contributing to the drop in dolphin mortality was the La Jolla Agreement, an agreement entered into voluntarily by the tuna fishing nations in 1992. Among other things, the Agreement established

vessel-specific mortality limits. The specific provisions of the La Jolla Agreement are discussed in previous annual reports. Under the Marine Mammal Protection Act and the La Jolla Agreement, dolphin mortality declined by more than 95 percent between 1988 and 1993. Although part of this decline was attributable to a smaller number of sets being made on dolphins, the primary factor in reducing incidental dolphin mortality was a marked reduction in the average number of dolphins killed per set.

Preliminary data indicate that dolphin mortality incidental to the eastern tropical Pacific tuna fishery declined in 1999 to a record low level. Although the Inter-American Tropical Tuna Commission is still collecting and analyzing data from 1999, it expects that incidental dolphin mortality for the year will be fewer than 1,500 individuals. In part, the reduction in dolphin mortality observed in 1999 is attributable to an approximately 18 percent decline in the number of dolphin sets made during the year, as compared to 1998. Continued improvement in vessel performance is also a factor. During 1999 the estimated dolphin mortality per set was about 0.164, as compared to 0.176 in 1998.

Subsequent to enactment of the 1988 amendments, some environmental organizations began to push for a complete cessation of the practice of setting on dolphins. Toward this end, they began to organize a consumer boycott of tuna caught by encircling dolphins. In response, the three largest U.S. tuna canners announced in 1990 that they would no longer purchase tuna caught in association with dolphins. This announcement led to further shifts in the eastern tropical Pacific tuna fishery as more U.S. vessels relocated to the western Pacific. It also prompted Congress to pass the Dolphin Protection Consumer Information Act, which set standards for labeling tuna as being "dolphin-safe" (*i.e.*, tuna caught during fishing trips on which no dolphin sets were made). Although the Marine Mammal Protection Act's tuna embargo provisions appeared to be an effective means of compelling other nations to reduce dolphin mortality, they came under fire as possibly being inconsistent with U.S. obligations under the General Agreement on Tariffs and Trade (GATT). Mexico challenged an embargo of its tuna before a GATT panel in 1990. A second challenge brought by the European Community

Table 9. Estimated incidental kill of dolphins in the tuna purse seine fishery in the eastern tropical Pacific Ocean, 1972–1999¹

<u>Year</u>	<u>U.S. Vessels</u>	<u>Non-U.S. Vessels</u>
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	1,002	26,290
1992	439	15,111
1993	115	3,601
1994	105	4,095
1995	0	3,274
1996	0	2,547
1997	0	3,005
1998	24	1,853
1999	0	<1,500 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.

and the Netherlands in 1992 claimed that the intermediary nation embargoes were not GATT-consistent. As discussed in previous annual reports, the dispute-resolution panels in those cases found the unilateral U.S. embargo provisions to be inconsistent with the GATT. The panels suggested, however, that such

trade sanctions may be permissible if designed to ensure compliance with a multilateral agreement. The panels' decisions were never formally referred to the GATT Council for adoption and do not have the force of final decisions.

The Marine Mammal Protection Act's tuna-dolphin provisions were amended further by the International Dolphin Conservation Program Act of 1992. The amendments were, in part, designed to address GATT concerns and focused on ways to eliminate, rather than merely reduce, incidental dolphin mortality. The amendments established a framework for a global moratorium on the practice of setting on dolphins to catch tuna. Although no fishing nation agreed to the moratorium and, as a result, certain provisions of the Act never became effective, other provisions were not contingent on a moratorium. Changes included (1) revising the quotas applicable to the U.S. fleet, (2) modifying the U.S. permit to proscribe setting on eastern spinner and coastal spotted dolphins, and (3) prohibiting, as of 1 June 1994, the sale, purchase, transport, or shipment in the United States of any tuna that is not dolphin-safe.

Despite the success of the international tuna fleet in reducing incidental dolphin mortality, under the comparability requirements of the Marine Mammal Protection Act, yellowfin tuna caught in the eastern tropical Pacific from countries whose vessels continued to set on dolphins was excluded from the U.S. market. This prompted six parties to the La Jolla Agreement — Colombia, Costa Rica, Ecuador, Mexico, Panama, and Venezuela — to issue a statement at the 1995 meeting of the Inter-American Tropical Tuna Commission, urging the United States to lift the embargoes then in effect. They contended that catching tuna in compliance with the International Dolphin Conservation Program was environmentally sound and that increased use of dolphin-safe fishing methods would harm biodiversity by increasing the discard of juvenile tuna and the bycatch of non-target species other than dolphins. The six nations stated that the situation was endangering their continued participation in the program established under the La Jolla Agreement. In response, Congress in mid-1995 began to consider the need for changes to the Marine Mammal Protection Act's tuna-dolphin provisions, particularly those concerning the tuna embargoes.

Concerned that an opportunity to consolidate the gains in dolphin conservation made under the La Jolla Agreement was slipping away, five environmental groups began discussions with representatives of Mexico in September 1995 to explore the possibility of a multilateral agreement among tuna fishing nations to formalize and strengthen the International Dolphin Conservation Program and lift U.S. tuna embargoes. These discussions led to a compromise supported by the tuna fishing nations, some environmental groups, and the U.S. Administration.

This compromise ultimately formed the basis for the Declaration of Panama, an agreement signed by representatives of the United States and 11 other nations on 4 October 1995. These nations declared their intention, contingent on the enactment of changes in U.S. law, to formalize the La Jolla Agreement as a binding international agreement and to incorporate additional dolphin protective measures. The envisioned changes to U.S. law included allowing access to the U.S. market for all tuna, whether caught by setting on dolphins or not, provided that it was caught in compliance with the agreement. The Declaration of Panama also called on the United States to refine the term dolphin-safe to include any tuna caught in the eastern tropical Pacific by a purse seine vessel in a set in which no dolphin mortality was observed. Among other things, the new international agreement would establish annual stock-specific quotas on dolphin mortality based on minimum population estimates and limit overall mortality to no more than 5,000 a year.

The International Dolphin Conservation Program Act

Efforts to amend U.S. law as called for by the Declaration of Panama culminated in enactment of the International Dolphin Conservation Program Act on 15 August 1997. The new law made several changes to the U.S. tuna-dolphin program. Amendments to section 304 of the Marine Mammal Protection Act direct the Secretary of Commerce, in consultation with the Marine Mammal Commission and the Inter-American Tropical Tuna Commission, to conduct a study of the effects of chase and encirclement on dolphins and dolphin stocks taken in the course of purse seine fishing for yellowfin tuna in the eastern

tropical Pacific. The study is to consist of abundance surveys and stress studies designed to determine whether chase and encirclement are having a "significant adverse impact on any depleted dolphin stock in the eastern tropical Pacific Ocean." Specifically, the amendments require the National Marine Fisheries Service to survey the abundance of depleted dolphin stocks during calendar years 1998, 1999, and 2000. The stress studies are to include (1) a review of relevant stress-related research and a three-year series of necropsy samples from dolphins killed in dolphin sets, (2) a one-year review of relevant historical demographic and biological data related to dolphins and dolphin stocks, and (3) an experiment involving the repeated chasing and capturing of dolphins by means of intentional encirclement.

The Service was directed to make an initial finding by March 1999, based on the preliminary results of the research program and any other relevant information, as to whether the intentional encirclement of dolphins is having a significant adverse effect on any depleted dolphin stock. A final finding is to be made between 1 July 2001 and 31 December 2002 and a report of that finding submitted to Congress. Unless the Service determines that chase and encirclement are having a significant adverse effect on a depleted dolphin stock, the definition of dolphin-safe tuna will be changed to include all tuna harvested in sets in which no dolphin mortality was observed.

The amendments also directed the National Marine Fisheries Service to engage in other research to further the goals of the International Dolphin Conservation Program. The Service, in consultation with the Marine Mammal Commission and with the cooperation of the nations participating in the International Dolphin Conservation Program and the Inter-American Tropical Tuna Commission, is to conduct such research, which may include projects to (1) devise cost-effective fishing methods and gear designed to reduce or eliminate incidental mortality and serious injury of dolphins; (2) develop cost-effective methods for catching mature yellowfin tuna that do not require setting on dolphins; (3) carry out assessments of dolphin stocks taken in the eastern tropical Pacific tuna fishery; and (4) determine the extent to which the incidental taking of non-target species, including

juvenile tuna, occurs in the eastern tropical Pacific tuna fishery and assess the impact of such taking.

Although still subject to the dolphin-safe labeling requirements, all tuna caught in the eastern tropical Pacific after the effective date of the amendments may be imported into the United States, provided it was caught in accordance with the requirements of the International Dolphin Conservation Program. The amendments further require that the total dolphin mortality limits and the per-stock limits for nations importing tuna to the United States progressively decline from 1997 levels. Once effective, the amendments would lift the zero quota and stock-specific restrictions that have prevented U.S. fishermen from setting on dolphins. U.S. fishermen would be able to apply for a permit allowing them to take dolphins in accordance with the provisions of the International Dolphin Conservation Program. Unlike the multi-year, general permits issued to the American Tunaboat Association in the past, individual vessels would be required to obtain annual permits.

Before the amendments take effect, two things are required to occur — (1) the Secretary of State must certify that a binding resolution of the Inter-American Tropical Tuna Commission (or some other legally binding international instrument) establishing the International Dolphin Conservation Program has been adopted and is in force, and (2) the Secretary of Commerce must certify that sufficient funding is available to complete the first year of the abundance surveys and the stress studies and that the studies have begun. On 27 July 1998 the Director of the National Marine Fisheries Service, on behalf of the Secretary of Commerce, certified that sufficient funding was available to complete the first year of the study on the effects of chase and encirclement on dolphins.

The parties to the Declaration of Panama signed the required binding international agreement, the Agreement on the International Dolphin Conservation Program, on 21 May 1998. Under its terms, however, it did not enter into force until it had been ratified by four parties. The Agreement thus entered into force on 15 February 1999 when Mexico became the fourth nation to submit its ratification. The other three nations that had ratified the Agreement were the United States, Panama, and Ecuador. Since it entered

into force, two other nations, Venezuela and Nicaragua, have ratified the Agreement and, on 12 May 1999, the European Community became a signatory to the Agreement.

The International Dolphin Conservation Program Act became effective on 3 March 1999, the date that the Secretary of State transmitted the required certification to Congress.

Implementation of the 1997 Amendments

As noted above, the International Dolphin Conservation Program Act requires the National Marine Fisheries Service to consult with the Marine Mammal Commission regarding implementation of mandated research into the effects of chase and encirclement on depleted dolphin stocks. Other research in furtherance of the goals of the International Dolphin Conservation Program required under the Act is also to be conducted in consultation with the Commission. In addition, the Service is required to consult with the Commission in developing regulations to implement the new provisions governing the taking of marine mammals in the eastern tropical Pacific tuna fishery.

Commission Consultations — The Commission established the groundwork for its consultations regarding the mandated research program in a 9 September 1997 letter to the National Marine Fisheries Service. The Commission solicited the Service's ideas on how best to structure the consultations and requested that the Service provide it with any proposals or draft plans that may have been developed. The Commission also sought information on the Service's plans for supporting other research to further the goals of the International Dolphin Conservation Program and for promulgating implementing regulations.

Since that time, the Commission and the Service have consulted on various aspects of the Service's research plans, analyses, and decision-making criteria. Correspondence between the agencies in 1998 is discussed in the previous annual report. Two issues raised in those letters, however, have been of concern to the Commission: the need for the Service to consult with the Commission on an ongoing basis and the need to begin the necropsy sampling study mandated by the 1997 amendments.

A threshold issue raised by the Commission in 1998 was what dolphin stocks the Service intended to factor into its findings on the effects of chase and encirclement on depleted stocks. The eastern spinner dolphin and the northeastern offshore spotted dolphin were designated as depleted in 1993 and clearly had to be considered in the findings. The Commission questioned whether a third stock, the coastal spotted dolphin, determined in 1980 to be below its optimum sustainable population level, also needed to be factored into the findings.

As discussed in the previous annual report, the National Marine Fisheries Service convened a meeting on 16-17 December 1998 in La Jolla, California, to review progress in planning and conducting the research required under the International Dolphin Conservation Program Act and to seek views concerning the decision-making rules and criteria to be used to make the initial finding on the effects of chase and encirclement in March 1999. The Service's scientists provided the meeting participants, which included two representatives of the Commission, with an overview of each element of its dolphin research program. They also noted that the Service, at least preliminarily, had decided to treat the coastal spotted dolphin as a depleted stock for purposes of making the initial finding. The focus of the meeting, however, was on the framework being developed for making the initial finding in March 1999 as to whether chase and encirclement may be preventing or retarding recovery of a depleted dolphin stock. Further details on the meeting are included in last year's annual report.

By letter of 8 January 1999 the Commission provided the Service with comments on several issues raised at the La Jolla meeting. The Commission noted at the outset that its participation in the meeting, while valuable, had not satisfied the consultative requirements of the Marine Mammal Protection Act, which sets forth specific procedures for formulating Commission recommendations, including consultation with the Committee of Scientific Advisors on Marine Mammals. To accomplish this, the Commission would need written documents from the Service to which the Commissioners and Committee members could react. Although not able to comment on the specifics of the proposed decision analysis framework being developed by the Service, the Commission

indicated its strong support for the Service's efforts to establish criteria beforehand.

One meeting participant had requested that the Service, as part of its effort to establish decision-making criteria, undertake an analysis of the legislative intent behind the term "significant adverse impact." The Commission conducted a preliminary analysis of the issue and described the few relevant statements in the legislative history in its letter to the Service. The Commission concluded that a more extensive review was not warranted.

The Commission welcomed the Service's decision to include coastal spotted dolphins in its analysis. Noting that historical data for this stock are less complete than for the offshore stocks, the Commission suggested an alternative approach for assessing the impact of chase and encirclement on this stock.

At the December 1998 review, the Service explained the difficulties it was having in obtaining permission to place technicians aboard foreign tuna seiners to collect necropsy samples. The Service also indicated that it had decided to conduct a pilot study to assess the feasibility of undertaking the full study envisioned by Congress in the 1997 amendments. In response, the Commission, as it had in the past, expressed concern over the lack of progress in initiating the necropsy study. Further, the Commission recommended that the Service promptly consult with Congressional oversight committees regarding its plans and rationale for conducting a pilot study rather than the full study called for in the Act.

Although generally supportive of the Service's efforts to use archived samples in innovative ways to detect indications of stress, the Commission expressed concern that results of these studies would likely not be available in time to be factored into the March 1999 finding. This being the case, the Commission recommended that the Service advise Congress of the plans for and status of its research efforts, noting that the initial finding was likely to be based largely on the results of a single abundance survey.

The Commission's letter also suggested steps that the Service should take to finalize the criteria for making the initial finding and the review of stress-

related literature. In both cases, the Commission believed that documents should be made available for public review and comment before the initial decision is made, but recognized that this may not be possible.

On 15 January 1999 the National Marine Fisheries Service provided the Commission with three documents describing different aspects of its tuna-dolphin research program, seeking comments in time for them to be factored into the initial finding on the effects of chase and encirclement. The three documents were the preliminary estimates of eastern tropical Pacific dolphin stocks based on the results of the 1998 abundance survey, the draft report of the review of stress-related literature, and a paper on the variability of dolphin habitat in the eastern tropical Pacific. In addition, the proposed decision framework for assessing the status of eastern Pacific dolphin stocks was provided to the Commission for review and comment on 1 February 1999.

The Commission, in consultation with its Committee of Scientific Advisors, provided the Service with comments on all four documents on 12 February 1999. Overall, the Commission believed the documents to be well written and appropriately focused on the key issues. With respect to the preliminary estimates of dolphin abundance, the Commission recommended several drafting changes that would make the reports clearer to policy-makers and members of the public who may not be familiar with the details of the survey design and methods used to analyze the data.

The Commission believed that the paper on the potential influence of fisheries-induced stress provided compelling support for its conclusion that chase and capture of dolphins in the eastern tropical Pacific tuna fishery could be having population-level effects on the life spans and productivity of dolphins. The Commission also noted that the paper provided a sound basis for formulating and designing research programs to test the hypotheses concerning stress responses in dolphins subject to chase and capture.

The Commission found the paper on the variability of dolphin habitat to be a useful assessment of water temperature and other environmental variables measured in the eastern tropical Pacific over the past two

or three decades. However, the Commission believed that the conclusion that "environmental variability cannot explain the apparent lack of recovery of northeastern offshore spotted and eastern spinner dolphin stocks since 1986" needed to be more fully explained. Further, the Commission suggested other variables that might usefully be examined, such as changes in fishing areas, numbers of dolphin sets, and sizes and quantities of tuna caught.

The proposed decision-making criteria provided to the Commission reflected the discussions that took place during the December 1998 meeting in La Jolla. They proposed three different thresholds for determining whether any apparent suppression in the growth of a depleted dolphin stock since 1991 should be viewed as significant. Those thresholds consider the likelihood that (1) the stock may be in danger of extinction, (2) the stock is not growing, or is growing very slowly, and (3) the time for the stock to recover to its maximum net productivity level will be extended substantially. The Commission found the proposed criteria to be reasonable and conceptually sound and recommended that they be adopted.

The Commission also reviewed the status of the tuna-dolphin research program at its 19-21 October 1999 annual meeting in Seaside, California. Based on that review, the Commission wrote to the Service on 30 November 1999 providing additional comments. The Commission noted that it was generally impressed with the quality of the Service's research program, which had brought together experts from different disciplines to address the complex questions underlying the directives of the 1997 amendments. The Commission also expressed support for the Service's efforts to develop objective criteria for making the required determinations.

The Commission noted, however, that despite the best efforts of the Service's scientists, virtually no data on the reasons why depleted populations of dolphins in the eastern tropical Pacific apparently have failed to recover as expected were available in time to be factored into the initial finding on the effects of chase and encirclement, discussed below. The Commission believed that this was largely due to the inability of the Service to place technicians onboard foreign tuna purse seine vessels to collect necropsy

samples from dolphins that had died incidental to fishing operations. In light of the statutory requirement that the Service examine a three-year series of necropsy samples, the necropsy sampling should have begun at the outset of 1998 so that the results would be available in time to be factored into the final determination on the effects of chase and encirclement. Yet, the Commission pointed out, nearly two years later not a single sample had been collected, and, although some technicians had been trained in the sampling protocol, none has been placed on commercial tuna vessels to begin collecting the samples.

As noted by the Service at the Commission's annual meeting, some tuna fishing nations apparently believe that it is to their advantage not to participate in the necropsy study. That is, without data that could potentially link stress from setting on dolphins with the apparent failure of depleted dolphin stocks to recover, the Service will be unable to find that chase and encirclement are having a significant adverse impact on those stocks. The Commission therefore reiterated a recommendation, made first in September 1998, that high-level officials within the Department of Commerce inform their counterparts in other fishing nations that failure to cooperate with the Service's efforts to collect necropsy samples will be viewed as a sign of bad faith that will result in the Service revoking its initial finding. The Commission further recommended that, if the Service does not believe that the International Dolphin Conservation Program Act provides sufficient latitude to defer making the mandated findings or to make affirmative findings if the underlying studies are not completed as expected by Congress, the Service immediately approach Congress to seek amendments to the Act to compel foreign nations to cooperate with the studies.

The Commission also indicated that, even if collection of necropsy samples were to begin immediately, it was doubtful that the Service would be able to obtain sufficient samples from each of the depleted stocks to provide meaningful results before the final determination is to be made. This would be even more of a problem if the Service still planned to conduct a pilot study before undertaking the full program, as it had previously indicated. This being the case, the Commission recommended that the Service, in consultation with the Commission, revisit

its plans for the necropsy study and develop an alternative schedule for collecting and analyzing a statistically significant number of samples from each of the depleted stocks in a shorter period of time. The Commission further recommended that, if the Service concludes that a study capable of providing meaningful results cannot be completed within the mandated time frame, and it appears unlikely that alternative methods of determining the effects of chase and encirclement on dolphin stocks will be conclusive, the Service initiate discussions with appropriate Congressional oversight committees about extending the deadline for making a final determination.

The Service also indicated at the Commission's annual meeting that the delay in beginning the necropsy study may have limited the availability of funding for this project. The Commission therefore requested that the Service advise it of the funding that has been earmarked for the necropsy study to date, what those funds have been used for, and whether the funds have been obligated in such a way as to allow the study to extend beyond 2000. The Commission also requested the Service's thoughts on alternative ways to fund the study fully if it appeared that specifically appropriated amounts may be insufficient.

The discussion of the tuna-dolphin research program at the Commission's meeting also considered the chase and recapture experiment mandated by section 304(a)(3)(C) of the Act. The Service indicated that it had questions concerning whether the experiment should be conducted at all and, if so, whether it should be done differently than originally planned. It was noted that the Service would be consulting with the Commission shortly on these questions. Although the Commission welcomed the planned consultations, it noted in its 30 November letter that this study had been included in the 1997 amendments based on the recommendations of a team of specialists in marine mammal stress who attended a workshop convened by the Service in 1997. Thus, the Commission believed that, if the Service intends to deviate from the statutory mandate, it was particularly important for the Service to provide a fully developed rationale that considers whether other planned studies are likely to determine whether the slower-than-expected growth of dolphin stocks in the eastern tropical Pacific is attributable to chase and encirclement.

Based on the review of the tuna-dolphin research program at the Commission meeting, the Commission identified a general need to strengthen consultation with respect to some studies. The Commission noted, for example, that it had yet to be consulted on many of the specific aspects of the analyses of historic demographic and biological data being conducted by the Service. The Commission therefore recommended that the Service review the consultation history and, as appropriate, ensure that consultation concerning all aspects of the program take place before the fact.

As noted above, the 1997 amendments directed the Service to undertake research to further the goals of the International Dolphin Conservation Program, separate from the program to study the effects of chase and encirclement. Inasmuch as the presentations at the Commission meeting did not discuss efforts and plans for such research, the Commission requested that the Service provide an update concerning activities being carried out pursuant to section 304(b) of the Act and initiate consultations with the Commission regarding any such studies.

The director of the Service's tuna-dolphin research program provided the Commission with an update of three aspects of the program by letter of 23 December 1999. The letter indicated that the Service intended to continue to develop its decision-making framework that will apply to the final finding on the effects of chase and encirclement. A formal letter requesting consultation is expected to be sent early in 2000 and a meeting to discuss the framework is planned for April 2000.

The letter also informed the Commission of the Service's intent to conduct a comprehensive review of dolphin abundance estimates derived from tuna vessel observer data. The Service indicated that a report from the first stage of the evaluation would be provided to the Commission early in 2000.

With respect to the chase and recapture experiment, the Service noted that it had held a meeting with interested non-governmental organizations in September 1999 to solicit their views and concerns regarding the proposed study. The Service indicated that a report of that meeting was being prepared and would be transmitted to the Commission in 2000,

along with a request for consultation on the advisability of proceeding with the study.

As of the end of 1999 the Commission had yet to receive a comprehensive reply to its 30 November letter to the Service. However, the Service informed the Commission that some technicians had been placed onboard tuna fishing vessels late in 1999 and had collected necropsy samples from five dolphins.

Independent Peer Review — On 12 January 1999 four members of Congress wrote to the Secretary of Commerce, noting the controversial nature of the findings to be made on the effects of chase and encirclement and urging the National Marine Fisheries Service to conduct an independent peer review of the scientific basis for making the findings. Specifically, the Congressmen recommended that a group of independent scientists be convened to review:

- the experimental design and results of the abundance surveys;
- the data requirements and models to be used to analyze the abundance data and determine population trends;
- the process and criteria for determining whether chase and encirclement are having a significant adverse impact on any depleted dolphin stock in the eastern tropical Pacific;
- the definition of "significant adverse impact" proposed by the Service along with a comparison of that definition with other scientifically derived conservation measures set forth in the Marine Mammal Protection Act, such as potential biological removal levels; and
- the proposed research plan for the required stress studies and the assessment of stress-related research on which the plan is based.

By letter of 22 February 1999 the Service informed the Commission that it had contracted with the University of Miami's Center of Independent Experts to conduct the requested review. An independent panel of three scientists with expertise in oceanography, stress physiology, and stock assessment would review the products of the Service's research program to determine if outside reviews have been appropriately considered and if the conclusions made are supported by the relevant literature and research. The letter

recognized the role of the Commission in planning and reviewing the program and invited the Commission to attend. The review was held in La Jolla on 8-11 March 1999. Two Commission representatives attended the first day of the review to offer the Commission's perspective on the program and answer questions concerning Commission comments and recommendations regarding the research.

The three reviewers provided separate evaluations of the Service's scientific program and information relevant to the International Dolphin Conservation Program Act on 22 March 1999. In general, the reviewers concurred with the direction of the research program, the Service's interpretation of the results, and the decision-making framework that had been developed. In some areas, however, the panel members believed that the presentation of the results should be accompanied by a more thorough discussion of the related uncertainties.

Initial Finding — As discussed above, the National Marine Fisheries Service was to make an initial finding by the end of March 1999 as to whether the intentional encirclement of dolphins is having a significant adverse effect on any depleted dolphin stock in the eastern tropical Pacific. On 31 March 1999 the Service published a notice in the *Federal Register* announcing the availability of the initial research results and explaining that, because of its decision to conduct the independent peer review requested by Congress, publication of the initial finding would be delayed by 30 days.

The Service made its initial finding on 29 April 1999 and published notice of that finding in the 7 May *Federal Register*. The rationale for the finding and a summary of the data on which it was based were presented in a report to Congress.

The Service noted that its population assessments indicated that the northeastern offshore stock of spotted dolphins and the eastern stock of spinner dolphins apparently are not increasing at the expected rate, despite the relatively low level of fishery-related mortalities reported from the tuna fishery since 1991. Available data did not enable the Service to assess whether the coastal stock of spotted dolphins had or had not increased at the expected rate. As recom-

mended by the independent peer reviewers, the Service cautioned that its conclusions were not without some uncertainty because of biases in the way that abundance data were collected by tuna vessel observers or a possible delay between the birth of dolphins and their attainment of sexual maturity following the years in which in dolphin mortality was first reduced to low levels.

The report then considered the possible causes of the slower-than-expected growth of these populations, looking at two possible causes — changing environmental conditions and indirect or unobserved effects of tuna fishing operations. The Service concluded that the environmental data examined to date showed no evidence of a recent ocean environmental shift or other long-term change that might have affected the growth rates of the depleted dolphin stocks. Turning to the tuna fishery as a possible cause of the apparently depressed growth rate, the Service indicated that its literature review had led to the conclusion that stress resulting from chase and encirclement could not be dismissed as a possible cause. The Service also identified two other possible fishery-related causes for the slower-than-expected growth rate — separation of dolphin mothers and calves during chase and encirclement and underreporting of direct mortality.

Although it believed that the rate of recovery has been lower than expected, the Service found that, based on the available data, there was insufficient evidence to conclude that chase and encirclement are having a significant adverse impact on any depleted dolphin stock in the eastern tropical Pacific. The Service apparently interpreted the statute as requiring that it make such a finding if it could not determine "with certainty" that depleted dolphin stocks have been adversely affected by chase and encirclement. In making this finding, the Service noted, however, that it could not rule out chase and encirclement as a possible cause. It indicated that efforts to resolve the uncertainties would continue and would be reflected in the final determination to be made by the end of 2002.

The notice published by the Service explained that the initial finding would not become effective until the effective date of final regulations implementing the provisions of the International Dolphin Conservation Program Act. That is, the definition of dolphin-safe

tuna would not change until a proposed rule had been published and finalized.

Implementing Regulations — Recognizing the consultation requirements of the International Dolphin Conservation Program Act, and in anticipation of the publication of proposed implementing regulations, the National Marine Fisheries Service provided the Marine Mammal Commission with a draft environmental assessment on a draft proposed rule in March 1999. The Commission provided comments to the Service by letter of 8 June. The Commission generally believed that the draft assessment did a good job of identifying the alternatives and discussing the possible impacts. The Commission noted, however, that some of the analyses were directed at issues specifically addressed by statute and over which the Service has no discretion. The Commission believed that, by eliminating discussion of these issues, the environmental assessment could be shortened and better focused on the critical issues. Specific comments and drafting suggestions were also provided.

The Service published proposed implementing regulations on 14 June 1999. The regulations would amend the provisions applicable to dolphin-safe tuna to reflect the Service's initial finding on the effects of chase and encirclement. Once implemented, tuna caught in sets with no observed dolphin mortality or serious injuries could be labeled as dolphin-safe. The regulations also would allow entry into the United States of all yellowfin tuna caught in compliance with the International Dolphin Conservation Program Act, whether dolphin-safe or not. As required by statute, the regulations would also establish tracking and verification requirements to ensure that tuna products imported into the United States are accurately labeled.

Other aspects of the proposed rule would apply only to U.S. fishermen. These provisions would establish procedures for U.S. fishing vessels to obtain annual permits allowing them to participate in the eastern tropical Pacific tuna fishery on an equal footing with vessels from other nations.

Comments on the proposed rule were submitted by the Commission on 9 September 1999. The Commission believed that the proposed regulations generally tracked the applicable provisions of the International

Dolphin Conservation Program Act and, except as noted in specific comments, recommended that they be adopted. Among other things, the Commission noted that the proposed rule needed to be updated to indicate that the International Dolphin Conservation Program Act had entered into force and to reflect the system for allocating stock-specific dolphin quotas, which was to have been adopted by the parties to the international agreement by 15 August 1999. In response to a specific request for comments as to whether affirmative findings of conformance with the requirements of the International Dolphin Conservation Program Act should be issued on a multiyear basis, the Commission expressed the view that annual findings needed to be made, at least with respect to determinations concerning whether countries are meeting their financial obligations to the Inter-American Tropical Tuna Commission and are complying with applicable dolphin mortality limits. Similarly, the Commission believed that determinations regarding imports from intermediary nations needed to be reviewed periodically.

The Service proposed to correct, through issuance of the regulations, an apparent drafting error in the 1997 amendments concerning the time relative to sunset by which sets must be completed. It appears that the applicable statutory provision erroneously established the point at which the backdown process is to be completed at 30 minutes before, rather than after, sundown. The Commission concurred that the statutory wording probably had resulted from an error, but noted that the legislative language was clear. The Commission therefore recommended that the problem be fixed by amending the Act rather than by regulation.

The Commission commented that the system of reporting and inspection requirements proposed by the Service to track and verify that tuna imported into the United States is properly labeled appears, at least in theory, to be adequate. The Commission expressed concern, however, that, although the Service will have the opportunity to observe offloading, deliveries, and other transfers, it was not clear what effort the Service intended to make in this regard. Without such information, the Commission was unable to comment on whether the proposed tracking and verification program would, in practice, provide the needed over-

sight. The Commission therefore recommended that the Service provide some sort of estimate of the effort that it expects to make to conduct spot checks under the tracking and verification program.

The Commission also noted that the proposed rule discussed efforts being made to negotiate an agreement among the nations that fish for tuna in the eastern tropical Pacific concerning a cooperative international tracking program, but did not indicate when such a program might be in place. The Commission thought it ill-advised, and possibly contrary to the requirements of the International Dolphin Conservation Program Act, to adopt final regulations allowing tuna to be imported into the United States before the international tracking and verification program has been agreed to and is in place.

The National Marine Fisheries Service published a related proposed rule on 22 December 1999, seeking comments on the proposed design of the official mark to be used to label dolphin-safe tuna. The Commission did not believe it necessary to submit comments.

As of the end of 1999 final implementing regulations had yet to be issued. They were expected to be published early in January 2000.

Litigation — As noted above, the National Marine Fisheries Service issued an initial finding on 29 April 1999 indicating that it was unable to determine whether chase and encirclement were having significant adverse effects on depleted dolphin stocks. On 18 August 1999 two individuals and ten environmental groups filed a lawsuit in U.S. district court challenging that finding (*Brower v. Daley*). The plaintiffs claimed that the best available scientific evidence supports a finding of significant adverse impact. They therefore alleged that the Service's finding was arbitrary and capricious and constituted an abuse of discretion in violation of the Administrative Procedure Act. Further in this regard, the plaintiffs contended that the evidentiary standard employed by the Service in making its finding (*i.e.*, that the evidence show "with certainty" that chase and encirclement are having significant adverse effects on depleted dolphin stocks) is inconsistent with the applicable statutory provision.

The federal defendants filed an answer to the complaint on 19 November 1999. As of the end of 1999 a briefing schedule in the case had yet to be set.

Pinniped-Fisheries Interactions

The 1994 amendments to the Marine Mammal Protection Act added a new section (section 120) to address interactions between pinnipeds and fishery resources. Under section 120, states may apply to the Secretary of Commerce for authorization to lethally remove individual pinnipeds known to be affecting certain salmonid stocks without obtaining a waiver of the Act's moratorium on taking, provided certain conditions are met. Section 120(f) directed the Secretary of Commerce to investigate and report to Congress by 1 October 1995 on the extent to which California sea lions and Pacific harbor seals are having a significant negative impact on the recovery of endangered or threatened salmonid fishery stocks or other components of the coastal ecosystems of Washington, Oregon, and California. Under section 120(h), the Secretary also was directed to establish a pinniped-fishery interaction task force to provide advice on possible measures to minimize interactions between pinnipeds and aquaculture operations in the Gulf of Maine.

A summary of past events and actions taken by the Commission and others during 1999 to implement these provisions are provided here.

Authorizations to Remove Pinnipeds

As noted above, section 120 of the Marine Mammal Protection Act allows states to request authority to lethally take individually identifiable pinnipeds that "are having a significant negative impact on the decline or recovery" of certain salmonid stocks. To date, only the State of Washington has requested authority to remove pinnipeds under this provision. Oregon is also monitoring an interaction problem, but is trying to address it using non-lethal means.

Ballard Locks — The number of winter-run steelhead salmon returning through the Chittenden, or Ballard, Locks in Seattle to spawn in streams empty-

ing into Lake Washington declined from nearly 3,000 in the early 1980s to fewer than 100 in 1994. During that time, there was a substantial increase in the number of California sea lions congregating near the locks to prey on steelhead. After efforts by the State of Washington and the National Marine Fisheries Service to reduce sea lion predation by non-lethal means failed, the Washington Department of Fish and Wildlife sought authority from the Service to lethally take individually identifiable California sea lions preying on winter-run steelhead migrating through the Ballard Locks. This prompted the Service to establish a pinniped-fishery interaction task force under section 120(c).

The findings and recommendations of the Ballard Locks Pinniped-Fishery Interaction Task Force have been addressed in detail in previous annual reports. In summary, based on the task force's recommendations, in January 1995 the National Marine Fisheries Service authorized the Washington Department of Fish and Wildlife to lethally remove individual California sea lions observed preying on winter-run steelhead migrating through the Lake Washington ship canal in the vicinity of the locks, provided that three conditions were met: (1) the animals had in the past been observed actually taking steelhead at the site; (2) efforts to prevent predation by non-lethal means had failed; and (3) the identified animals were present during the run. The authorization, initially valid to 30 June 1997, was extended until 30 June 2001.

Under the authorization, the State of Washington is required to submit a report on its activities by 1 September each year to the National Marine Fisheries Service. The state's first report, describing actions taken during the 1994-1995 winter steelhead run, noted that no sea lions were killed during the run; however, three animals seen eating steelhead were captured, held in captivity until the end of the run, and then transported to the Strait of Juan de Fuca and released. One of the captured sea lions was held for more than four months before being released.

No sea lions were lethally removed from the Ballard Locks area during the 1996 winter steelhead run; however, three animals thought to be the primary cause of the predation were captured and removed to permanent captivity at Sea World in Orlando, Florida.

During 1997 and again during 1998 and 1999, no incidents involving sea lion predation on steelhead were observed in the Ballard Locks area although one untagged sea lion was seen in 1998 foraging on coho salmon. Steelhead salmon escapement has increased from 70 in 1994, to 126 in 1995, 234 in 1996, 620 in 1997, and 584 in 1998, but dipped to about 220 in 1999. Pending new developments, review by the Ballard Locks task force has been suspended, and no further action is planned. The State of Washington and the National Marine Fisheries Service continue to monitor the situation.

Willamette River — In recent years, California sea lions have been observed in the lower Willamette River in Oregon during the winter and spring months coinciding with the migration of chinook and steelhead salmon. In addition, observers from the Oregon Department of Fish and Wildlife have documented sea lions foraging on salmon near fishway entrances at Willamette Falls during the peak salmon runs. During this period, the river's spring chinook and winter steelhead populations — the only native salmonid populations occurring above the falls — have declined, raising concern about the potential effects of sea lion predation on those stocks.

By *Federal Register* notice of 13 March 1997 the National Marine Fisheries Service requested comments on a draft environmental assessment concerning interactions between California sea lions and salmonids at the Willamette Falls fish passage facility. The draft assessment addressed the potential consequences of a proposal by the Service and the Oregon Department of Fish and Wildlife for the non-lethal removal of sea lions at the Willamette Falls site. The joint proposal also included plans for monitoring the extent of sea lion predation and identifying additional deterrence measures.

On 2 January 1998 the Service published a notice in the *Federal Register* announcing the availability of an environmental assessment and finding of no significant impact on its proposal to take non-lethal measures to prevent sea lion predation on salmonid stocks at Willamette Falls. During 1998 the Service and the Oregon Department of Fish and Wildlife continued a joint monitoring program to document sea lion predation at the site.

At its annual meeting in Seaside, California, on 19-21 October 1999 the Commission was advised by representatives of the Oregon Department of Fish and Wildlife that a growing number of sea lions have been observed at Willamette Falls during the winter/spring salmon run, and there is concern that the level of interaction will increase. At present, however, the state does not have adequate information to identify individual problem animals, as is required before lethal removal can be authorized.

As discussed in Chapter II, the Marine Mammal Commission on 29 June 1999 appeared before the House Subcommittee on Fisheries Conservation, Wildlife and Oceans to address implementation of the 1994 amendments to the Marine Mammal Protection Act and problems that may warrant additional legislation. In its statement, the Commission noted that, to date, only Washington State has applied for pinniped removal authority. Although such authority was granted in response to the situation at Ballard Locks, non-lethal deterrence, along with non-lethal removal of three problem animals, has apparently been effective in addressing the situation.

In the Commission's opinion, the Ballard Locks situation demonstrated that only a few individual pinnipeds can have a considerable impact on dwindling salmonid stocks at some sites. Thus, such occurrences may be relatively simple to address by removing the problem animals. The Commission therefore recommended that Congress retain the lethal removal authority unchanged to enable the National Marine Fisheries Service and affected states to respond to specific problems involving localized predation of salmonid stocks.

Investigation of Possible Pinniped Impacts on Endangered West Coast Salmonid Stocks

As noted above, section 120(f) of the Marine Mammal Protection Act directed the Secretary of Commerce to investigate whether California sea lions and Pacific harbor seals are having significant negative impacts on the recovery of salmonid stocks that are either listed or are candidates for listing under the Endangered Species Act. In addition, the Secretary is to determine whether these pinnipeds are having

broader adverse impacts on the coastal ecosystems of Washington, Oregon, and California. A report on the results of the investigation was to be completed by 1 October 1995.

To address this task, the Service constituted a working group that reviewed information on the status and trends of California sea lions, Pacific harbor seals, and the seven species of salmonids found in Washington, Oregon, and California. Based on the working group's report, and discussions with the Pacific States Marine Fisheries Commission, the Service prepared a draft report to Congress addressing the impacts of sea lions and harbor seals on salmonids and west coast ecosystems.

A copy of the draft report, along with the working group's report, was forwarded to the Marine Mammal Commission and others for comment on 3 April 1997. A discussion of the draft report's findings and recommendations, along with the Commission's comments, are included in previous annual reports. Among other things, the draft report proposed amending the Marine Mammal Protection Act to authorize state and federal officials to kill California sea lions and harbor seals seen eating salmonids from stocks listed as endangered or threatened or from other depressed salmon stocks if non-lethal deterrence methods have been determined to be ineffective or impractical.

In its comments on the Service's draft report, the Commission recommended, among other things, that the Service revise the report to request that Congress authorize such steps as may be needed to reduce pinniped predation under the following conditions: (1) the proposed action is part of a comprehensive plan to restore one or more specific salmonid stocks, (2) the plan has been made available for public review and has been approved by the Service, and (3) there is an adequate monitoring program to verify that the management actions are contributing as expected to the recovery of the salmonid stocks.

The Marine Mammal Commission also recommended that the Service either (a) expand its report to explain the rationale for the criteria that would be used to identify problem pinnipeds and decide when non-lethal deterrents are ineffective, or (b) defer its proposal for authorizing fishermen and government

officials to kill pinnipeds until it can be shown with greater certainty that pinniped predation cannot be addressed effectively by practical, non-lethal means.

On 10 February 1999 the Service submitted its Report to Congress on Impacts of California Sea Lions and Pacific Harbor Seals on Salmonids and West Coast Ecosystems. The report concluded that, although the nature and extent of conflicts between pinnipeds and other elements of west coast ecosystems are unclear, there are a number of places where these conflicts do exist and reports of them are increasing in frequency and degree. The report identified a high potential for pinniped impacts on salmonid populations at a number of sites along the west coast. In addition, the report noted, pinnipeds also conflict with commercial and recreational fisheries, cause damage to docks and boats, and create human safety issues.

In response to the Commission's recommendation that the Service defer its proposal to authorize lethal taking of pinnipeds, the Service's report concluded that, in cases where enough is known about pinniped effects on other living marine resources to raise valid concerns, management action should not be delayed to obtain additional information. Accordingly, the report recommended that Congress amend the Marine Mammal Protection Act to give federal and state agencies a general authorization in certain instances to lethally remove California sea lions and Pacific harbor seals to resolve apparent conflicts that pose a risk to depleted salmonid stocks.

The Service concurred with the Commission recommendation that, in situations involving pinniped predation on salmonid stocks, a salmon conservation or recovery plan be in place or in development before the lethal removal of pinnipeds is authorized.

In its 29 June 1999 testimony before the House subcommittee, mentioned above, the Commission stated that it shared the National Marine Fisheries Service's view that resource agencies should be given authority to stop pinniped predation that is preventing or impeding the recovery of depleted salmonid stocks, and that lethal measures are appropriate when non-lethal measures are neither practical nor effective. The Commission underscored its belief that such authority should be available only in those instances

when a conservation or recovery plan that appropriately addresses all factors responsible for the salmonid stock's depressed status is in place, the plan has been made available for review by interested parties and approved by the Service, and procedures have been established to verify that the authorized management actions have the expected results.

It is expected that Congress will give further attention to pinniped-fishery interactions as it considers reauthorization of the Marine Mammal Protection Act in 2000.

Gulf of Maine Task Force on Aquaculture-Pinniped Interactions

As recognized by the 1994 amendments to the Marine Mammal Protection Act, marine mammals may have adverse effects on aquaculture operations. One area of particular concern is the northeastern United States, where both the salmon aquaculture industry and local populations of harbor seals and gray seals have increased in recent years. Operators of aquaculture facilities in the area have complained that there has been a corresponding increase in pinniped predation on penned fish. In response, Congress added section 120(h) to the Act. It directed the Secretary of Commerce to establish a task force to examine situations in which "pinnipeds interact in a dangerous or damaging manner with aquaculture resources in the Gulf of Maine."

After consulting the Marine Mammal Commission and others, the National Marine Fisheries Service established a seven-member task force, including representatives of industry, state government, the scientific community, and conservation organizations. In August 1997 the Service provided Congress with a report of the task force findings, including recommendations regarding alternatives for mitigating such interactions. This has been discussed in detail in previous annual reports.

In its 29 June 1999 testimony before the House subcommittee, noted above, the Marine Mammal Commission referenced the Service's report. The Commission noted that, although economic losses resulting from pinniped predation on penned fish may

be substantial, the report concluded that better data are needed on the nature and extent of damage being caused by seals. The report placed the responsibility for collecting such data on the aquaculture industry. In addition, the report considered it to be industry's responsibility to develop facilities and deterrence technologies that will prevent seals from getting to penned fish.

The report suggested, however, that in instances where a seal has entered a fish pen despite all efforts to prevent entry, and when efforts to remove the seal could jeopardize human safety, lethal removal authority should be provided. In its testimony, the Commission noted that it concurs with this conclusion, but stressed that, before being given such authority, aquaculture operators should be required to meet certain standards with respect to pen design and construction.

Review of Pinniped-Fishery Interactions At the Commission's Annual Meeting

Among the issues receiving the Commission's attention at its annual meeting on 19-21 October were interactions between pinnipeds and fisheries. Information presented at the meeting confirmed that, in addition to predation on endangered and threatened salmonid stocks, seals and sea lions are having detrimental effects on salmon troll fisheries and on the operations of commercial passenger fishing vessels along the U.S. west coast. It is expected that Congress will direct attention to these problems as it considers reauthorization of the Marine Mammal Protection Act during 2000.

Following consultation with its Committee of Scientific Advisors, the Commission wrote to the National Marine Fisheries Service on 30 November 1999. In its letter, the Commission noted that although these interactions have the potential to have significant adverse economic effects on commercial and recreational fisheries, its main concern was with the potential for pinnipeds to target salmonids as they return to spawning grounds or smolts as they migrate to the sea. The Commission believes that there is a real risk that, in some instances, such predation may prevent depleted fish stocks from recovering and may

even contribute to their extinction. The Commission therefore recommended that the Service continue to work closely with the states to identify situations in which use of the lethal pinniped removal authority may be appropriate.

Prior to amendment of the Marine Mammal Protection Act in 1994, commercial fishermen were authorized to lethally take marine mammals to protect their gear and catch when non-lethal means had proven ineffective. Under the 1994 amendments, such intentional lethal taking of any marine mammal in the course of commercial fishing operations is prohibited. Despite this prohibition, it appears that the lethal take of marine mammals is continuing in some locations. At its 1999 annual meeting, the Commission was advised by representatives from the Marine Mammal Center that between 50 and 100 seals and sea lions are found stranded every year with gunshot wounds along the California coast between San Luis Obispo and Mendocino Counties. It is believed that many, if not most, of these animals are shot by commercial fishermen attempting to stop animals from taking fish.

In response to this information, the Commission in its 30 November letter noted that the number of animals being shot each year is probably much greater than reported because many animals are likely shot and killed but not recovered. In the Commission's opinion, this situation constitutes a significant problem that the Service should address, both through better education and increased enforcement. Toward this end, the Commission recommended that the Service prepare educational materials to be distributed to fishermen and posted at docks and other prominent locations. These materials should describe what deterrence measures are permissible under the Marine Mammal Protection Act. In addition, the Commission urged the Service to place higher priority on identifying those responsible for the shootings. The Commission further suggested that, to help clarify matters, the Service finalize its guidelines for non-lethal deterrence measures required by section 101(a)(4) of the Act, which were published in proposed form in 1995.

Related discussions at the Commission's annual meeting also pointed to the need for additional efforts to develop effective, non-lethal means for deterring

pinnipeds from taking caught fish. In its 30 November letter the Commission noted that funds provided to the Service and the Pacific States Marine Fisheries Commission to study west coast pinniped-fishery interactions have been directed primarily at documenting the extent and nature of interaction problems, rather than focusing on developing non-lethal ways to deter seals and sea lions from engaging in such interactions. Accordingly, the Commission recommended that the Service convene a workshop of fishery specialists, marine mammal behaviorists, trainers, and other appropriate experts to recommend a program of specific studies aimed at identifying safe and effective deterrence measures.

The review of pinniped-fishery interactions also included discussion of a planned field test for a pulsed-power generator to deter sea predation. Discussion of this topic is included in Chapter VII.

It was also noted at the Commission's meeting that seals and sea lions sometimes follow fishing boats, but not other types of boats, as they leave port. This suggests that fishermen may be inadvertently alerting pinnipeds as to when and where fishing operations are going to take place. It therefore seems possible that

pinniped-fishery interactions could be reduced by studying visual, auditory, and other cues that seals and sea lions use to locate fishing operations in an effort to identify alternative practices that fishermen might use. In its letter, the Commission recommended that the Service pursue this line of investigation.

A number of acoustic deterrent devices are currently being used or proposed to deter pinnipeds from taking fish. At the Commission's meeting, some speakers expressed concern that some devices pose significant risk of damaging pinniped hearing. It was noted that the three sea lions removed from Ballard Locks in 1996 were exposed to acoustic harassment for an extended period before their capture. One animal has died and the two surviving animals are now being maintained in captivity at Sea World in Florida. It was noted that some insight into the potential risk of exposure to acoustic harassment devices could be gained by examining the hearing of the two surviving sea lions and, if available, the internal ears of the third animal. In the Commission's opinion, some useful results could be obtained from such studies. It therefore recommended that the Service coordinate with Sea World to conduct appropriate examinations of these animals.

Chapter V

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.

During 1999 the Commission continued efforts to update 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 the International Whaling Commission, conservation of marine mammals and marine ecosystems in the Arctic and the Southern Ocean, 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.

The Compendium of Treaties and International Agreements

In 1994 the Marine Mammal Commission published *The Marine Mammal Commission Compendium of Selected Treaties, International Agreements, and Other Relevant Documents on Marine Resources, Wildlife, and the Environment*. The three-volume, 3,500-page *Compendium*, current through 1992, contains the complete texts of more than 400 international agreements, including more than 100 multilateral and 90 bilateral treaties, agreements, accords, and

memoranda of understanding. It also includes numerous amendments and protocols to these documents, several non-binding international documents, and a number of significant documents to which the United States is not a party.

The *Compendium* is divided into two sections comprising multilateral and bilateral documents, many of which were made publicly available for the first time. Subject areas include Antarctica, environment and natural resources, fisheries, marine mammals, marine pollution, marine sciences and exploration, and others. The *Compendium* also contains background information for each document, including primary source citations, the depositary nation or organization, the city in which the document was concluded, the date it was concluded, and, where applicable, the date on which it entered into force.

In 1997 the Commission published the *First Update* to the *Compendium*, which contains documents that were concluded between 1 January 1993 and 31 December 1995, as well as a number of older documents not included in the original *Compendium*. The revised edition contains more than 25 additional multilateral and 50 additional bilateral documents in the same subject areas as the original. The *First Update* was published by the U.S. Government Printing Office and is available from the Superintendent of Documents.

In 1999 the Commission completed work on the *Second Update* to the *Compendium*, which covers the period between 1 January 1996 and 31 December 1998. The *Second Update* includes more than 50 additional multilateral and 20 additional bilateral agreements, as well as older documents not listed in the original *Compendium* or *First Update*. Like its predecessor volumes, the *Second Update* is focused on

legal instruments that specifically address natural resource conservation, pollution, or protection of the marine environment. The subject areas have been altered slightly to reinforce this focus. The volume is expected to be published in late spring of 2000.

The *Compendium* and its updates continue to serve the environmental, legal, and academic communities by providing easy access to documents that define and establish international legal commitments of the United States and other nations in the field of environmental protection.

International Whaling Commission

The failure of the International Whaling Commission (IWC) to regulate commercial whaling effectively prior to the 1970s allowed many whale stocks to be reduced to levels approaching biological extinction. This was one of the factors that led to passage of the Marine Mammal Protection Act and establishment of the Marine Mammal Commission. Since it was established, the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, has continued to provide advice to the Department of Commerce and the Department of State on measures necessary to restore depleted whale stocks and to ensure that commercial and aboriginal subsistence whaling does not cause any whale stock to be reduced or maintained below its optimum sustainable level. Activities related to the 1999 annual meeting of the IWC are described below.

Preparations for the 1999 IWC Meeting

Among the principal issues facing the IWC and its Scientific Committee at their 1999 meetings were the following:

- commercial whaling being conducted by Norway without IWC authorization;
- development of a Revised Management Scheme, particularly with respect to observation and monitoring measures that are needed before commercial whaling might resume;

- a request by Japan for a catch authorization of 50 North Pacific minke whales to be taken by coastal community-based whalers;
- development of a new management regime for aboriginal subsistence whaling;
- the continued killing of minke whales by Japan in the Southern Ocean and the North Pacific Ocean for purposes of scientific research;
- the pressing need to conserve highly endangered whale stocks;
- the effects of climate change and environmental contaminants on whale stocks;
- the possible effects of consuming whales on human health;
- the relationship between the IWC and other international organizations; and
- the future of the IWC.

The Undersecretary of Commerce for Oceans and Atmosphere currently serves as the U.S. Commissioner to the IWC. The commissioner has lead responsibility for developing and pursuing U.S. positions on all matters related to the IWC. To assist in formulating policies that are both scientifically sound and supported by the public, the National Oceanic and Atmospheric Administration holds a series of meetings each year to seek the views of government agencies, non-governmental organizations, and the public.

In preparation for the 1999 IWC meeting, meetings of the public/interagency committee were held on 4 December 1998 and on 19 February and 7 April 1999 to review U.S. positions. A representative of the Marine Mammal Commission attended these meetings as part of the Commission's efforts to work with officials of the National Oceanic and Atmospheric Administration, the Department of State, and the Department of the Interior to develop agreed positions. In addition, the Marine Mammal Commission provided copies of the report from its Workshop on Marine Mammals and Persistent Ocean Contaminants (see Chapter VII) to the IWC's Scientific Committee prior to the 1999 meeting to help with its review of environmental effects on whales.

Intersessional Meetings — Although formal action by the IWC is generally confined to annual meetings, work goes on throughout the year to prepare for those meetings. Two intersessional meetings were held in

1998 to prepare for the 1999 annual meeting, a meeting of commissioners to discuss an Irish proposal concerning the future of the IWC and a special meeting of the IWC Scientific Committee to prepare a comprehensive assessment of right whales worldwide. These meetings are discussed in the previous annual report.

In 1999 two intersessional meetings were convened to prepare for the IWC meeting in 2000. A workshop on the status and trends of the western North Atlantic stock of right whales was held by the IWC Scientific Committee in Woods Hole, Massachusetts, on 24-27 October 1999. The Scientific Committee also held a workshop on 16-20 November 1999 in Seattle, Washington, to continue the development of management procedures for aboriginal subsistence whaling. A third intersessional meeting is scheduled for 7-10 February 2000 in Tokyo to review Japan's program of research whaling in the North Pacific.

The 1999 Meetings of the IWC and Its Scientific Committee

The 51st annual meeting of the IWC was held in Grenada 24-28 May 1999. The IWC Scientific Committee also met in Grenada prior to the annual meeting. The principal issues considered are described below.

The Moratorium on Commercial Whaling — In 1982 the IWC adopted a moratorium on commercial whaling that entered into effect during the 1985 pelagic and 1986 coastal whaling seasons. Although several nations filed formal objections to the moratorium, only Norway and Russia continue to maintain their objections. Under the International Convention for the Regulation of Whaling, nations that file objections within a specified period after a measure is approved are not obligated to comply with that measure. As discussed below, the IWC is working on developing a Revised Management Scheme, which, if adopted, would provide a framework for lifting the moratorium.

As it has each year for the past 11 years, Japan submitted a proposal to the IWC requesting a quota of 50 minke whales to allow four coastal communities to

engage in "small-type" whaling operations. Japan contends that whaling at this level would have no adverse impact on the stock and is needed to alleviate economic distress in these communities resulting from the moratorium on commercial whaling. Opponents point to the commercial aspects of the proposal and contend that the integrity of the moratorium should be sustained unless and until the Revised Management Scheme is adopted and the moratorium lifted. As with similar proposals put forth by Japan at past IWC meetings, the 1999 request for a minke whale quota was not adopted.

As noted in previous annual reports, Norway resumed commercial whaling for minke whales in the eastern North Atlantic in 1993 under its objection to the whaling moratorium. This prompted the IWC in 1995, 1996, 1997, and 1998 to adopt resolutions calling on Norway to refrain from further whaling unless authorized by the IWC. For 1999 Norway established a quota of 753 minke whales, an increase over the 1998 quota of 671 whales. Although no resolution was passed at the 1999 meeting, 17 countries, including the United States, referred to the most recent resolution and called on Norway to cease its whaling.

The Revised Management Scheme — Prior to adoption of the moratorium on commercial whaling, excessive catch quotas authorized by the IWC contributed to the overexploitation and depletion of whale stocks. At its 1986 meeting the IWC asked its Scientific Committee to develop a scientifically based method for determining commercial whaling catch quotas that would have a low probability of adversely affecting harvested whale stocks. The committee subsequently did so, and the revised management procedure it recommended was accepted in principle at the 1994 IWC meeting as part of a Revised Management Scheme being developed to regulate any resumption of commercial whaling. The IWC recognized that determining catch limits that have a low probability of adversely affecting exploited stocks, however, is only a part of an effective management program. Work is ongoing to develop other essential components of the Revised Management Scheme, including mechanisms for compliance monitoring and enforcement and requirements for conducting whale surveys and data analyses.

Before the 1999 IWC meeting the Working Group on the Revised Management Scheme met to consider draft revisions to the Convention Schedule proposed by Japan that would be needed to implement the scheme. Although appreciative of the work that Japan had done, the United States and some other participating countries noted that, inasmuch as they had been provided with the draft only the day before, they were not in a position to comment fully. It was agreed that written comments on the Japanese draft would be provided and that, based on those comments, the IWC Secretariat would prepare and circulate a revised draft for consideration at the IWC's meeting in 2000.

The IWC at its 1999 meeting adopted one resolution related to the Revised Management Scheme. At the previous meeting some countries, including the United States, indicated their belief that DNA testing of whale meat and maintenance of landing and transshipment records are integral parts of an adequate monitoring and enforcement program. Other members contended that such matters relate to trade and are outside the competence of the IWC. Although deferring resolution of the issue, the parties adopted a resolution calling on the Scientific Committee to report both on progress concerning genetic methods for identifying whale species, stocks, and individuals and on efforts to collect and archive tissue samples from whales. Further, the resolution requested the Scientific Committee to provide advice on the development and implementation of a verifiable and transparent system for identifying and tracking whale products that would allow differentiation between whale products taken in accordance with and in violation of the Convention.

The Future of the IWC — At the 1997 IWC meeting Ireland expressed the view that, unless progress was made to complete the Revised Management Scheme, there was a risk that the IWC could collapse, with the result being that commercial whaling would take place outside its control. Noting that the revised management procedure had been adopted and that work was proceeding on inspection and control schemes, Ireland offered a proposal to break the impasse that has developed between nations supporting a resumption of commercial whaling and those that oppose it. Under the Irish proposal, the IWC would complete and adopt the Revised Manage-

ment Scheme and issue quotas for certain coastal whaling activities, such as those conducted by Norway and proposed by Japan. All other waters would be declared a global whale sanctuary. Products from the authorized whaling could be used only for local consumption, with no international trade allowed. In addition, lethal scientific research whaling would be phased out.

Discussions of the Irish proposal continued at the 1999 meeting, but there was no progress toward developing a consensus. Nevertheless, several commissioners expressed interest in continuing discussions, and agreement was reached to keep the matter on the IWC agenda for the 2000 meeting.

Aboriginal Subsistence Whaling — The IWC Schedule of Regulations includes catch limits for aboriginal subsistence whaling. In 1997 the IWC adopted new quotas for the subsistence taking of bowhead and gray whales by Natives in the United States and Russia under shared quotas. Those quotas remained unchanged in 1999, as did quotas for subsistence taking of fin and minke whales by Natives in Greenland. The taking of bowhead and gray whales by U.S. and Russian Natives is discussed in the sections on these two species in Chapter III.

A new three-year quota was adopted by the IWC at its 1999 meeting authorizing the taking of up to two humpback whales per year by subsistence whalers in St. Vincent and the Grenadines. In response to concern that St. Vincent whalers had been targeting mothers and calves, the Schedule was amended to specify that taking calves or any humpback whales accompanied by a calf is forbidden. In adopting this quota, the parties noted that any humpback whale less than eight meters long is to be considered a calf and that the St. Vincent government has committed to (1) ensure that the hunt is properly regulated, (2) review and improve hunting and killing methods, (3) cooperate with other parties on research related to its whale hunt, and (4) submit a detailed needs statement when the quota is next considered for renewal.

Work also continued on efforts by the Scientific Committee, begun in 1995, to develop a new aboriginal subsistence whaling management scheme. This work was also pursued at a 16-20 November 1999

workshop, hosted by the United States, which focused on procedures for establishing strike limits for bowhead and gray whales.

Research Whaling — The International Convention for the Regulation of Whaling allows member nations to issue permits to its citizens to kill whales for scientific research purposes, provided that research plans are submitted to the IWC Scientific Committee for review and comment before the permits are issued. Since 1988 Japan has issued permits for research whaling. The value of this research has been much debated, and the IWC has adopted a series of non-binding resolutions calling on Japan to refrain from issuing permits authorizing lethal research.

During its 1999 meeting the IWC again considered Japan's proposals to continue two research programs involving the killing of whales. One involves the catch of up to 440 minke whales in the Southern Hemisphere and the other involves the catch of 100 minke whales in the western North Pacific. As in past years, the IWC adopted a resolution calling on Japan to refrain from issuing permits for research whaling in the forthcoming (1999/2000) season. A second resolution adopted by the IWC, although not specific to research whaling being conducted by Japan, called on the Scientific Committee, when reviewing plans for such research, to provide advice as to whether the proposed research is required for management purposes and whether the information sought could be obtained by non-lethal means.

Assessments of Whale Stocks — As part of the comprehensive assessment of whale stocks called for under the moratorium on commercial whaling, the IWC Scientific Committee has for the past several years focused attention on assessing the status of various stocks. At its 1999 meeting the Scientific Committee continued its work to apply the revised management procedure to the North Pacific stocks of minke and Bryde's whales. The Scientific Committee also considered information related to stock identity, abundance, vital rates, and other factors for several stocks of whales including Southern Hemisphere blue whales, North Pacific and Southern Hemisphere stocks of minke whales, North Pacific Bryde's whales, North Atlantic right whales, and Southern Hemisphere and North Atlantic humpback whales.

In addition, the Scientific Committee focused its attention on certain small stocks of whales that number less than 500 and are considered highly endangered. Based on the work of the Scientific Committee, the IWC adopted a resolution introduced by the United States calling on all governments to refrain from authorizing any further takes from these endangered stocks until the Scientific Committee concludes that such takes will not cause a continued threat to their survival or recovery. The stocks to which the resolution applies are the Okhotsk and Spitsbergen stocks of bowhead whales, the eastern Canadian Arctic (Baffin Bay/Davis Strait and Hudson Bay) stocks of bowhead whales, the western North Pacific stock of gray whales, all four stocks of northern right whales, and various stocks of blue whales. Although Canada is no longer a member of the IWC, the resolution was to be sent to its government, which continues to authorize Native hunting of bowhead whales from the eastern Canadian Arctic stock. The Scientific Committee expects to review further the status and trends of these endangered whale stocks at its meeting in 2000.

Environmental Effects — For more than a decade, the IWC has expressed concern about the potential effects of habitat degradation on whales. At its 1992 meeting the IWC decided that its Scientific Committee should consider the impact of environmental changes on whale stocks on a regular basis. Since that time, the IWC has sponsored workshops to plan and examine studies to investigate the effects of chemical pollution, climate change, and other environmental changes on cetaceans. At the 1999 IWC meeting the United States delivered a multimedia presentation summarizing the threats to cetaceans posed by human impacts on the environment.

The Scientific Committee and its Standing Working Group on Environmental Concerns identified and strongly endorsed two high-priority research programs designed to examine environmental threats. The first study, called POLLUTION 2000+, is designed to look at the concentrations and effects of pollutants on cetaceans. Initial work will look at PCBs in harbor porpoises and bottlenose dolphins. The second project, SOWER 2000, is part of a cooperative research program involving the IWC, the Commission on the Conservation of Antarctic Marine Living

Resources (CCAMLR), and Southern Ocean Global Ocean Ecosystems Dynamics Research (SO-GLOBEC) to study the distribution, abundance, and biomass of baleen whales in the Southern Ocean. The parties agreed at the 1999 meeting that \$200,000 would be made available as core funding for this research.

Concern was also expressed regarding the possible implications to human health from consumption of whale products. Although recognizing that eating whale meat may have positive health effects, the IWC noted that some communities may be faced with health problems arising from high levels of organic contaminants and heavy metals entering their diets in whale products. The IWC therefore called on nations to take measures to reduce pollution that may cause negative health effects on people who consume cetacean products and directed the Scientific Committee to work with the World Health Organization and other competent authorities to collect and review data on contaminant burdens in cetaceans and report back to it on health concerns.

Small Cetaceans — For several years there has been debate within the IWC as to whether the International Convention for the Regulation of Whaling confers jurisdiction over small cetaceans as well as large whales. In 1999 Switzerland submitted a legal analysis concluding that the IWC has not only authority over small cetaceans, but an obligation to manage these populations. Several other countries continue to believe that management of small cetaceans is best left to national and regional authorities. The United States continues to believe that the IWC has competence to regulate directed takes of all cetaceans. As in past years, no consensus was reached on this issue.

Although the issue has yet to be resolved, the parties have been willing to take limited actions concerning small cetaceans. At its 1999 meeting the Scientific Committee reviewed the status of populations of beluga whales and narwhals. The Committee intends to continue its review of the status of freshwater cetaceans, expanding the scope of the review to include populations of the tucuxi, Irrawaddy dolphin, and finless porpoise, at its meeting in 2000.

The Scientific Committee also considered ongoing efforts to reduce fisheries bycatch of small cetaceans

using acoustic devices (*e.g.*, pingers). Although these devices are now being used in many fisheries worldwide, most of what is known about their effectiveness comes from field experiments on a single species, the harbor porpoise, and on only one type of gear, bottom-set gillnets. The Committee expressed concern that these devices are being deployed without any attempt to test their efficacy or monitor their effects and recommended that controlled scientific experiments be conducted. Further, the Committee cautioned that habituation by small cetaceans could reduce the effectiveness of pingers over time and noted that research to develop other measures to mitigate bycatch should also be pursued.

The Scientific Committee also reviewed recent information on the directed take of Dall's porpoises in Japan. It noted that more than 115,000 porpoises have been taken in the fishery in the past eight years, that take levels have increased, that there is a potential for significant fisheries-related bycatch from the targeted stocks, and that there is a need to update the abundance estimates on which Japanese quotas are based. Based on the concerns expressed by the Scientific Committee, the IWC adopted a resolution encouraging Japan to conduct further abundance surveys and genetic studies and submit its results to the IWC. The resolution also directed the Committee to review the status of the affected stocks at its 2001 meeting and asked Japan to reconsider its Dall's porpoise quota pending that review.

Sanctuaries — In 1994 the IWC established a whale sanctuary in the Southern Ocean. As discussed in previous annual reports, Japan filed an objection to the designation of this sanctuary and continues to conduct scientific whaling in sanctuary waters. As in past years, Japan questioned the legal and scientific basis for the sanctuary at the IWC's 1999 meeting. Consistent with this view, Japan sought a Schedule amendment that would open the sanctuary to commercial whaling, should it be authorized by the IWC. After this amendment was rejected, Japan withdrew a second amendment seeking to exempt minke whales from the ban on commercial whaling in the Southern Ocean sanctuary.

Brazil had hoped to submit a proposal at the 1999 meeting to establish a South Atlantic sanctuary. This

proposal, however, was withdrawn before the meeting to enable Brazil to work with other range states to resolve outstanding issues. The proposal is expected to be considered at the IWC's next meeting.

Australia, with support from New Zealand, submitted a proposal to create a sanctuary in the South Pacific Ocean. Consideration of this matter was postponed so that the proposal could be reviewed by the Scientific Committee before the 2000 meeting.

Killing Methods — For many years, the IWC has sought to develop improved methods for killing whales, with the goal that death should be as quick and painless as possible. Toward this end, a three-day workshop on whale-killing methods was held just prior to the IWC's 1999 meeting. Participants described methods currently in use and, when available, provided data on killing times. The United States provided information on the methods used by the Alaska Eskimo Whaling Commission and the Makah Tribe to hunt whales.

There continues to be disagreement among the IWC members as to whether issues of humaneness are within the organization's competence. This has prompted considerable debate about what issues the working group should examine and what the group should be called. At the 1999 meeting, it was decided that the group should be named the Working Group on Whale Killing Methods and Associated Welfare Issues. To guide the activities of the working group, the IWC adopted a revised action plan on whale-killing methods, calling on parties to continue their efforts to improve killing methods, develop better criteria for determining when whales have been rendered insensible, and collect and present standardized data on primary and secondary killing methods.

The IWC also passed a resolution concerning matters arising from the 1999 workshop on whale-killing methods. The resolution identifies the information that should be provided at the annual meetings of the working group, including the number of whales killed by each method, the number and proportion of whales killed instantaneously, the time to death for each whale not killed instantly, the number of whales targeted and missed, the number of whales struck and lost, the caliber of rifle and number of bullets used,

and the methods used to determine unconsciousness and time to death. The resolution also encourages the development of indicators other than cessation of movement that could be used to determine time-to-death more accurately.

Cooperation with Other Organizations — As discussed later in this chapter, the parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) considered proposals at their 1997 meeting to downlist four stocks of minke whales, the eastern North Pacific stock of gray whales, and the western North Pacific stock of Bryde's whales from Appendix I to Appendix II. Such downlistings could open up commercial trade in whale meat internationally. In response to these proposals, the CITES parties affirmed an earlier resolution to consult with the IWC on proposals to amend the listing of whales on the CITES appendices.

This debate carried over to the 1997 IWC meeting and has prompted the IWC to examine its relationships with other international organizations. At its 1998 meeting the IWC adopted a resolution expressing appreciation for the decision by CITES to uphold prior actions to promote cooperation between the two organizations. The IWC reaffirmed the importance of continued cooperation and requested that the CITES Secretariat continue to consult with it on proposals to amend the listing of whales on the CITES appendices.

Anticipating that downlisting proposals will again be considered at the CITES meeting to be held in April 2000, the IWC, at its 1999 meeting, adopted a further resolution on cooperation between the two organizations. The resolution, among other things, directs the IWC Secretariat, in commenting on any proposal to downlist whale stocks from Appendix I to Appendix II, to advise CITES that the IWC has not yet completed a revised management regime to ensure that future commercial whaling catch limits are not exceeded and can be adequately protected. Further, the IWC Secretariat was directed to inform CITES that zero catch limits remain in force for all species of whales managed by the IWC.

Whale Watching — For several years, organizations opposed to commercial whaling have championed whale watching as an economically viable

alternative. In response, the IWC and its Scientific Committee have considered various issues related to whale watching. At its 1999 meeting the Scientific Committee identified a need to assess the long-term effects of whale-watching activities on whales and scheduled a workshop to be held prior to the 2000 IWC meeting. The workshop will also review information on national whale-watching guidelines, dolphin feeding programs, and swim programs involving whales and dolphins.

Future Meetings — The 52nd meeting of the IWC is scheduled to be held on 3-6 July 2000 in Adelaide, South Australia. The Scientific Committee will meet in Adelaide on 14-26 June. A site for the IWC meeting in the year 2001 has yet to be selected.

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 (CITES) 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 at the beginning of 1999 had been signed by 144 countries who became Parties to the Convention. During 1999 Azerbaijan, Grenada, Ukraine, and Iceland became signatories to the Convention, bringing the number of CITES members to 148. Within the United States, the Fish and Wildlife Service is the lead agency for federal actions under the Convention. The National Marine Fisheries Service provides technical expertise on marine species and participates in CITES meetings, including Conferences of the Parties.

The Convention provides for three levels of trade control. Depending on the conservation status of a species, 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 and 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 to two-and-a-half years to consider, among other things, additions and deletions to the appendices. The 10th and most recent meeting of the Conference of Parties took place in June 1997 in Zimbabwe. The 11th meeting, originally scheduled for November 1999 in Indonesia, will be held 10-20 April 2000 at the United Nations Environment Programme headquarters in Gigiri (Nairobi), Kenya.

Proposed Changes to the Appendices

Prior to a meeting of the CITES Parties, any Party may propose adding or deleting species to the appendices or transferring species from one appendix to another. At the 1997 meeting, CITES Parties considered five proposals put forth by Japan and Norway to downlist certain stocks of minke whales, gray whales, and Bryde's whales from Appendix I to Appendix II. Such a move, if approved, could be significant in that it would open the door for commercial export or import of meat or other parts from these species, provided that the necessary permits are obtained. At the 1997 meeting, CITES members rejected the four proposals involving minke and gray whales, and Japan subsequently withdrew the fifth proposal to downlist Bryde's whales.

With the postponement of the 11th Conference of Parties, CITES members had until 12 November 1999 to propose amendments to the appendices. As had been expected, Japan resubmitted proposals to downlist the eastern Pacific stock of gray whales (*Eschrichtius robustus*) and the Okhotsk Sea/west Pacific and Southern Hemisphere stocks of minke whales (*Balaenoptera acutorostrata*). Likewise, Norway resubmitted a proposal to downlist the northeast Atlantic and

North Atlantic central stocks of minke whales from Appendix I to Appendix II. Japan did not resubmit its proposal to downlist Bryde's whales.

Because of its standing as a range state for the affected whale stocks, the United States was consulted by the Fisheries Agency of Japan prior to resubmission of the Japanese proposals. On 29 October 1999 the Fish and Wildlife Service wrote to the Japanese Fisheries Agency strongly opposing the downlisting proposals. In its letter, the Service reiterated the United States' opposition to downlisting any species or population of whales subject to the International Whaling Commission (IWC) moratorium on commercial whaling. In the opinion of the United States and several other CITES Parties, it is inappropriate to consider downlisting any whale species until the IWC has completed the revision of its management regime to bring all whaling under effective IWC control.

The United States' views on the Norwegian proposal are similar to those relayed on the Japanese proposals. However, the United States is not a range state for the affected North Atlantic minke whale stocks, and Norway did not consult with the United States before submitting its downlisting proposal.

Two additional proposed changes to the CITES appendices involving marine mammals were also submitted prior to the 12 November 1999 deadline. These included a joint proposal by the United States and Georgia to transfer the Black Sea bottlenose dolphin (*Tursiops truncatus ponticus*) from Appendix II to Appendix I. The subspecies, which is isolated from other populations of bottlenose dolphins, is found only in the Black Sea, and its population has declined greatly due to overexploitation, diminished food resources, the impacts of pollution, and other fundamental changes in the Black Sea ecosystem. The size of the current population is unknown, and no estimates exist of sustainable levels of take. Thus, the proposal notes, any take for purposes of exhibit or export are potentially detrimental to the population.

In addition, Australia has proposed transferring the Australian population of dugongs (*Dugong dugon*) from Appendix II to Appendix I to eliminate potential enforcement problems caused by the current split listing. Dugongs, once widely distributed in the

tropical and sub-tropical coastal areas of the Indian Ocean and southwestern Pacific, have been exterminated or are now extremely rare in much of their former range. With the exception of the Australian population, the species is now listed on Appendix I. Although the Australian population is estimated to total 85,000 animals or more, and is not considered to be endangered, its transfer to Appendix I would place all dugong populations on the same appendix, eliminating the possibility of permits being issued based on falsified applications. Permit applicants would not be able to claim that an animal was from an Appendix II (Australian) population when it was actually from an Appendix I population.

In its proposal, Australia noted that it had consulted the population's range states, all of which supported moving the Australian population to Appendix I.

CITES Relationship to the International Whaling Commission

As discussed in previous annual reports, in recent years there has been an ongoing debate among various CITES Parties concerning the relationship between CITES and the IWC. In 1982 the IWC imposed a moratorium on the commercial take of large whales pending development of a revised management regime that would ensure adequate protection for affected whale stocks (see the IWC section above). Many CITES Parties, including the United States, have stated opposition to any proposals to revise the appendix designations for whales before the IWC has adopted a Revised Management Scheme for commercial whaling. Other Parties believe there is a need for independent action under CITES using the Convention's own criteria when listing species on the appendices, without taking into consideration the views or actions of the IWC.

At the 10th Conference of Parties in 1997 Japan introduced a proposed resolution to repeal a long-standing CITES resolution that recommends that Parties not issue permits for harvest or trade for primarily commercial purposes of any species or stock protected from commercial whaling by the IWC. After lengthy debate, the draft resolution was defeated by a vote of 51 to 27. The discussion, however,

resulted in a clarification from the CITES Secretariat stating that, although consultation was essential under CITES and other conventions, such as that implementing the IWC, this did not mean that it was obligatory for there to be strict adherence in one convention to decisions made within another.

The CITES Convention stipulates, however, that when a proposal for a marine species is received for consideration by the CITES Parties, the CITES Secretariat must consult "intergovernmental bodies having a function in relation to those species" for their comments. In apparent anticipation of such a request, the IWC, at its 23-27 May 1999 annual meeting in Grenada, overwhelmingly adopted a resolution directing its Secretariat to advise CITES Parties that the IWC has not yet completed a revised management regime and that zero catch limits remain in force for species of whales managed by the IWC.

At the end of 1999 two relevant proposed resolutions were submitted for consideration at the April 2000 CITES meeting: one from the United States and one from Japan and Norway, acting jointly. The U.S. draft resolution is being put forth as a means to reaffirm and strengthen the cooperation and synergy between CITES and the IWC. It calls on the CITES Parties to acknowledge the directives and provisions of the IWC's May 1999 resolution, endorses the cooperation between CITES and the IWC on matters of international trade in and management of whales, and urges all CITES Parties to make every effort to ensure that this cooperation continues.

The Japanese/Norwegian draft resolution acknowledges that the IWC Scientific Committee has accumulated a great deal of scientific knowledge that would contribute to the proper conservation and management of whales, but further acknowledges that other sources, such as the North Atlantic Marine Mammal Commission, can also provide a substantial amount of scientific information about whales. Expressing the view that the IWC's moratorium was a political decision not supported by scientific information, Japan and Norway call on CITES Parties to decide on amendments to the CITES appendices on the basis of CITES' own criteria, taking into account scientific information from the IWC and other sources.

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 previous annual reports, in 1994 the CITES Parties adopted a resolution recognizing the need for the IWC and the CITES Secretariats to cooperate and exchange information on international trade in whale products. The resolution urged countries to report any incidents of illegal trade in whale products to the CITES Secretariat.

Despite the cooperation that has resulted from the resolutions adopted by both CITES Parties and the IWC, illegal trade in meat from Appendix I whale species remains a significant concern. At the June 1997 CITES meeting, a consensus document was adopted as a formal decision addressing cooperation in monitoring illegal trade in whale meat. The decision encourages CITES Parties to inventory frozen whale products possessed in commercial quantities and to collect samples for DNA identification from all inventoried stocks, as well as from baleen whales taken in indirect harvests and, where practicable, from aboriginal and incidental takes. It further invites all concerned countries to cooperate in determining sources of whale meat in cases of smuggling, or unknown identity, and to make relevant information available to the CITES Secretariat for dissemination to interested Parties.

It is anticipated that the subject will be reviewed at the next CITES meeting in April 2000.

Russian Harvest of Beluga Whales

Late in August 1999 the Marine Mammal Commission received unconfirmed reports that arrangements were being made to export 200 tons of beluga whale meat and blubber from Russia for sale in Japan. To provide this amount of meat and blubber, the reports claimed that Russian hunters planned to take more than 2,000 beluga whales from stocks in the Barents Sea, the Bering Sea, the Sea of Okhotsk, the White Sea, and waters off western Kamchatka. The reports, initially provided by the International Fund for Animal Welfare and subsequently substantiated by Russian

officials, also indicated that an initial shipment of whale meat was imminent.

The reports were troubling for several reasons. First, it was not clear whether the whale stocks from which the animals had been or would be taken could sustain such removals. In addition, there currently is no international trade in meat from small cetaceans, and the export could set an alarming precedent encouraging harvests of other small cetaceans.

Although the IWC reviews the status of small cetacean populations, such as those of beluga whales, and provides non-binding management advice on their conservation, disagreement among IWC members over the scope of the organization's management authority has prevented the IWC from adopting regulatory measures, such as harvest quotas, for small cetaceans. However, beluga whales are listed on Appendix II of CITES and, because Russia and Japan are Parties to the Convention, any shipment of beluga whale products to Japan would first require the issuance of a CITES export permit by the appropriate Russian agency. Under provisions of the Convention, export permits for species listed on Appendix II are not to be issued unless it can be shown that the proposed trade will not threaten stocks of the listed species and that specimens are legally acquired.

To assess the impact of commercial harvests on affected stocks, the Commission immediately contracted for a review of information on the status of beluga whale stocks in Russian waters (see also Chapter IX and Appendix C, Reeves 1999). The contractor examined published data on the status of Russian beluga whale stocks, as well as data and conclusions from reviews of beluga whale stocks conducted earlier in 1999 by the small cetacean subcommittee of the IWC's Scientific Committee and an *ad hoc* Working Group on the Population Status of Beluga and Narwhal in the North Atlantic of the North Atlantic Marine Mammal Commission's Scientific Committee. The contractor's report indicated that information is insufficient to reliably define the boundaries of discrete beluga whale stocks in Russia, and that data on the abundance of beluga whales in different areas of Russia are both limited and out of date. Based on past abundance estimates, however, it appeared that

planned harvests could pose a significant threat to stocks in at least some areas.

In light of the contractor's report and its understanding that a decision on the Russian CITES permit was imminent, the Commission wrote on 8 September 1999 to the Chairman of Russia's State Committee for the Environment, the agency responsible for issuing CITES permits in Russia. In its letter, the Marine Mammal Commission expressed its view that information was insufficient to reach definitive conclusions about the status of beluga whale stocks in Russia. It therefore noted the inappropriateness of considering action to authorize permits for the planned export of beluga whale meat to Japan. In separate letters of 9 September 1999 the Commission also wrote to the State Department, the National Oceanic and Atmospheric Administration, and the Council on Environmental Quality. In its letters, the Commission advised the agencies of its actions and urged intervention in the issue at the highest levels of government.

On 10 September 1999 the State Department cabled the U.S. embassies in Russia and Japan. The cables requested that the embassies contact officials of both governments to remind them of the U.S. position opposing commercial whaling and international trade in whale meat. They also asked that the governments be advised of the strong U.S. public and likely Congressional response that would result, should the proposed trade proceed. The cables also requested that the Russian IWC Commissioner be asked to provide information on the status of the Russian CITES permit, Russia's intent to pursue commercial harvests of beluga whales, and the stocks to be exploited, and that the Japanese government be asked to provide information on its intent to import beluga whale meat from Russia. In response to these communications, it was learned that the Russian Government had issued four separate CITES permits on 3 September 1999 to export beluga whale meat to Japan.

In light of these actions by the Marine Mammal Commission and the Department of State, as well as public attention brought to bear by the International Fund for Animal Welfare, Congressional concern organized by Congressman William Delahunt of Massachusetts, and other expressions of international concern, the Russian Government revoked the permits

to export beluga whale meat to Japan on 14 September 1999. Although one shipment of 13 tons of beluga whale meat arrived in Japan on 14 September, the other three permits were withdrawn, and as of the end of 1999 the Commission was aware of no further shipments of beluga whale products from Russia to Japan or any other countries.

Conservation of Marine Mammals and Their Habitats in the Southern Ocean

Six species of large whales, six species of seals, and nine species of small cetaceans live throughout the year or seasonally in the Southern Ocean (the seas surrounding Antarctica). They include blue, fin, sei, humpback, minke, and sperm whales; crabeater, Weddell, leopard, Ross, elephant, and fur seals; and killer, long-finned pilot, Arnoux's beaked, and southern bottlenose whales; hourglass, dusky, Commerson's, and southern right whale dolphins; and the spectacled porpoise.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, conducts a continuing review of activities in Antarctica and surrounding waters that could affect marine mammals directly or indirectly. Commission representatives participate in interagency meetings to develop U.S. policies regarding activities in Antarctica and the Southern Ocean. Commission representatives have served on U.S. delegations to most regular and special Antarctic Treaty consultative meetings in the last 20 years and to most meetings of the Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources. Related activities carried out in 1999 are described below.

The 23rd Antarctic Treaty Consultative Meeting

The Antarctic Treaty, which was concluded in 1959 and entered into force in 1961, requires that the Treaty Parties meet periodically to consider and recommend to their governments measures necessary to give effect to the Treaty, including measures necessary to conserve living resources in the Treaty Area. Since the Treaty came into effect in 1961,

there have been 23 regular consultative meetings and 11 special consultative meetings. Special consultative meetings are held to consider particular matters and to conclude separate agreements, such as the Convention for the Conservation of Antarctic Seals, the Convention on the Conservation of Antarctic Marine Living Resources, the Convention on the Regulation of Antarctic Mineral Resource Activities, and the Protocol on Environmental Protection to the Antarctic Treaty. The Antarctic Treaty and the related measures and independent agreements adopted by the Treaty Parties are known collectively as the Antarctic Treaty System. Previous Commission reports describe the key provisions of the Antarctic Treaty and the other components of the Antarctic Treaty System.

[Each Antarctic Treaty Party has designated a national contact point where information on the Treaty System can be obtained. The U.S. contact point is the Director, Office of Ocean Affairs, Room 5805, U.S. Department of State, Washington, DC, 20520-7818. The contact points for the other Treaty Parties are listed in the reports of recent Treaty Meetings. A current list of national contact points can be obtained from the U.S. national contact.]

The 23rd Antarctic Treaty Consultative Meeting was held in Lima, Peru, from 24 May to 4 June 1999. The Committee for Environmental Protection, established by the Protocol on Environmental Protection to the Antarctic Treaty, met for the second time during the first week of the meeting. Immediately before the meeting, a workshop was held to identify steps that could be taken to improve the Antarctic protected areas system as envisioned in Annex V of the Environmental Protocol.

Subjects considered by the Committee for Environmental Protection included requirements for reviewing drafts of comprehensive environmental evaluations circulated in accordance with Annex I of the Environmental Protocol; guidelines for preparation of environmental impact assessments; species afforded special protection under the Environmental Protocol; diseases of Antarctic wildlife; specially protected areas; environmental monitoring; development of a report on the state of the Antarctic environment; emergency response and contingency planning; and data and

information exchange. Subjects considered by the Consultative Meeting included liability for damage to the Antarctic environment; establishment of a permanent secretariat; cost and scheduling of future Treaty meetings; and the advice of the Environmental Committee concerning the previously noted topics.

Consideration of Draft Environmental Impact Assessments — As noted in the Commission's previous report, the most contentious issue at the first meeting of the Committee for Environmental Protection was its role in providing advice on draft comprehensive environmental evaluations. Most delegations believed that the Committee was required by the Protocol to consider and provide advice to the Treaty Parties on all draft comprehensive environmental evaluations circulated for comment, as required by Annex I of the Protocol, and that the activities for which comprehensive evaluations are prepared should not be undertaken unless the Committee reviews and advises the Treaty Parties of the merits of both the activity and the environmental impact evaluation. The U.S. delegation pointed out that the purpose of environmental assessment is to ensure that the possible environmental impacts of activities are identified during the planning stages and that judgments on the acceptability of possible environmental impacts, and the decision whether to proceed with a particular activity, are made by the party planning the activity, not by the Committee or the consultative meeting.

At the meeting in Lima, it was recognized that there are differing interpretations as to whether the Protocol requires the Committee to consider and provide advice on all draft comprehensive environmental evaluations. Possible means for resolving the differing interpretations were discussed in an informal contact group chaired by the United States. The group suggested and both the Committee and the Consultative Meeting subsequently agreed that (1) the agenda for all future Committee meetings should include an item entitled "Consideration of Draft Comprehensive Environmental Evaluations Forwarded to the Committee in Accordance with Paragraph 4 of Article 3 of Annex I to the Protocol"; and (2) what constitutes appropriate Committee consideration of draft comprehensive evaluations will be determined by the Committee through practice, on a case-by-case basis. It also was agreed that, in some cases, it would

be useful for the Committee to establish open-ended contact or correspondence groups to facilitate consideration of particular scientific or technical matters related to draft evaluations.

Guidelines for Environmental Impact Assessment — At its first meeting in Tromsø, Norway, in 1998 the Committee established an open-ended correspondence group to work during the intersessional period before the meeting in Lima to develop guidelines for meeting the requirements of Protocol Annex I regarding environmental impact assessment. The environmental officer at the National Science Foundation's Office of Polar Programs provided U.S. input to this group. The guidelines developed by the group were presented to the Committee at its 1999 meeting and were revised to take into account comments provided by Committee members. The revised guidelines were endorsed by the Consultative Meeting and are included in the report of the meeting. The guidelines parallel those used by U.S. government agencies to give effect to corresponding provisions in the National Environmental Policy Act.

Specially Protected Species — Annex II of the Environmental Protocol provides that special protection may be afforded to certain species of mammals, birds, and plants indigenous to Antarctica. Fur seals and Ross seals, which were afforded special protection under the Agreed Measures for the Conservation of Antarctic Fauna and Flora adopted by the Consultative Parties in 1964, were listed as specially protected species when the Annex was adopted in 1991. Populations of fur seals have grown substantially and much has been learned about the distribution and abundance of Ross seals since the Agreed Measures were adopted in 1964. Over the same time period, longline fisheries have developed that have a high level of incidental bird mortality and appear to be jeopardizing the continued existence of several bird species (see the following section regarding activities related to marine living resources).

At the meeting in Lima, the United Kingdom proposed that a review be undertaken of the list of specially protected species attached as Appendix A to Annex II of the Environmental Protocol. The Committee recommended, and the Consultative Meeting concurred, that the Scientific Committee on Antarctic

Research (SCAR) should be requested to review and advise the Committee of those species of Antarctic flora and fauna it believes merit special protection. The review is to be completed by 2001.

Diseases of Antarctic Wildlife — As noted in Chapter VI and in previous Commission reports, there appears to have been an increase in the last 20 to 25 years in the frequency and magnitude of unusual marine mammal mortality events. A number of these events were or may have been caused by new or unusual diseases.

The increase in tourism, fisheries, and science-related activities in Antarctica brings with it an increasing potential for introducing diseases to the indigenous wildlife. To assess the risks, and what might be done to reduce them, the Antarctic Division of the Australian Department of the Environment held a Workshop on Introduction of Disease to Antarctic Wildlife in August 1998. A member of the Commission's Committee of Scientific Advisors participated in the workshop (see page 182 in the Commission's previous report). A paper describing the preliminary results of the workshop was presented for consideration at the 1999 meeting of the Committee for Environmental Protection.

The Committee (1) suggested that the full workshop report, when completed, be provided for consideration to the Treaty Parties, SCAR, and the Council of Managers of National Antarctic Programs; and (2) agreed that an open-ended contact group should be formed to consider and report to the Committee on practical measures that might be taken to reduce the risk of introduction and spread of diseases to Antarctic wildlife, and to detect, determine the cause, and minimize the adverse effects of unusual wildlife mortality events in Antarctica. An offer by Australia to chair the contact group was accepted.

U.S. input to the contact group will be provided through the National Science Foundation's Office of Polar Programs.

Specially Protected Areas — As noted earlier, a workshop was held before the beginning of the Committee meeting in Lima to consider and provide advice on measures needed to effectively implement

Annex V (Area Protection and Management) of the Environmental Protocol. The workshop was organized and hosted by Peru. An oral report of the workshop proceedings was provided to the Committee. Following consideration of the report, the Committee agreed to establish an intersessional correspondence group to develop guidelines or a framework for identifying areas that should be afforded special protection to create the protected area system envisioned in Article 3 of Protocol Annex V.

The contact group will be led by New Zealand. The National Science Foundation's Office of Polar Programs will be responsible for providing U.S. input on this matter.

Environmental Monitoring — Among other things, Article 3 of the Environmental Protocol calls for regular and effective monitoring to facilitate early detection of the possible unforeseen effects on the Antarctic environment of activities carried out both within and outside the Antarctic Treaty Area. As noted in previous Commission reports, a meeting of experts on environmental monitoring was held in Buenos Aires, Argentina, in June 1992 to identify the most probable sources of environmental impacts and the monitoring that would be required to provide early warning of such impacts. Subsequently, SCAR and the Council of Managers of National Antarctic Programs were asked to identify and provide advice on priority needs and the design of monitoring programs required to meet those needs.

SCAR and the program managers council held workshops in Oslo, Norway, and College Station, Texas, in October 1995 and March 1996 to consider the request from the Treaty Parties. Their findings were provided to the 21st Antarctic Treaty Consultative Meeting, held in New Zealand in May 1997, in a report entitled "Monitoring of Environmental Impacts from Science and Operations in Antarctica." Among other things, the report proposed, and the Treaty Parties endorsed, preparation of a technical handbook describing standard monitoring techniques, and consideration of steps that could be taken to coordinate environmental monitoring by the various Treaty Parties so as to avoid wasteful duplication and ensure the most effective use of resources.

With regard to the last point, the United States presented a paper at the 22nd Consultative Meeting in Tromsø, Norway, describing pollution prevention and abatement measures carried out by the National Science Foundation at McMurdo Station since 1987. Among other things, the paper noted that the National Science Foundation has banned open burning, cleaned up and closed the waste dump, and developed and implemented a program to prevent and contain fuel spills at McMurdo Station. The paper illustrated actions that other Treaty Parties could take to clean up and reduce the production of environmental contaminants at their stations in Antarctica.

During the 1999 meeting of the Committee for Environmental Protection, SCAR and the program managers council jointly presented a paper describing their follow-up to the workshops held in 1995 and 1996. They advised that a coordinating group had been established to identify priority indicators of environmental impacts and that a handbook of standardized monitoring techniques for those indicators was being prepared. They also advised that the Antarctic Environmental Officers Network was planning to hold a workshop on environmental monitoring during the program managers council meeting in Goa, India, in September 1999 to consider ways in which national programs might coordinate their environmental monitoring activities.

The Committee asked the program managers council and SCAR to report on these efforts at its next meeting. Both agreed to do so.

State of the Antarctic Environment Report — As noted in previous Commission reports, at the 21st Consultative Meeting in 1997 New Zealand proposed that the Treaty Parties cooperatively support development of a report on the status of the Antarctic environment. The United States and others questioned whether the usefulness of such a report would justify the time, personnel, and financial investment that would be required to produce it. At the 22nd Consultative Meeting in 1998 New Zealand presented a concept paper developed after consultation with other interested Parties during the intersessional period. The concept paper failed to address the range of questions that had been raised during the Consultative Meeting in 1997. It was agreed that an open-ended

correspondence group, chaired by Sweden, would consider the matter further and report back to the Committee in 1999.

The report presented by Sweden at the 1999 meeting of the Committee described a range of possible approaches from a simple assessment of variables that would have to be considered in developing and periodically updating an environmental status report to a comprehensive, multi-year compilation and analysis of available information identifying critical uncertainties and what would be required to resolve them. SCAR offered to prepare a scoping paper describing (1) the key environmental variables that would have to be considered in assessing the status of the Antarctic environment, (2) the present and future threats to that environment, and (3) possible links with environmental status reports done or being done for other parts of the world. The offer was accepted and SCAR will present a paper for consideration at the next meeting of the Committee.

Emergency Response and Contingency Planning

— At the 22nd Consultative Meeting in Tromsø, Norway, the Antarctic program managers council was asked to undertake an assessment of the risks of environmental emergencies arising from activities in Antarctica, including an analysis of incidents that have occurred in the Treaty Area over the past 10 years, and the types of future incidents that could occur in connection with science programs and related support activities. In response, the program managers council provided two papers for consideration at the 1999 meeting of the Committee. The first described the range of incidents that have occurred and either had or could have had environmental impacts that could have been prevented or minimized by emergency response and contingency planning. It concluded that spills of diesel fuel and other petroleum products were responsible for most incidents requiring response actions and that most spills occurred on land. The second paper recommended development of contingency plans for incidents in addition to oil spills that could have environmental consequences.

The Committee requested that the Council and the International Association of Antarctica Tour Operators obtain information on environmental emergencies and contingency planning from national programs and tour

operators, and provide that information to the Committee at the next meeting. Both the program managers council and the tour operators association agreed to do so.

Data and Information Exchange — Both the Antarctic Treaty and the Protocol on Environmental Protection require that the Parties annually exchange information on their past and planned activities in Antarctica. SCAR and the Council of Managers of National Antarctic Programs also have data and information exchange requirements.

At the Consultative Meeting in Tromsø, Norway, in 1998 the United States presented a paper suggesting ways that the various information exchanges might be coordinated and done electronically. At the 1999 meeting in Lima, the program managers council indicated that it has begun using electronic mail for advanced exchange of operational information and is providing some operational information on its website (www.comnap.aq). The United States indicated that at least three Parties had posted their 1998 Antarctic Treaty Information Exchange Reports on the World Wide Web and that it has begun to establish links between the various websites. It was agreed that consideration should be given to integrating the various reporting requirements and using modern technology to facilitate the exchange of information.

It was suggested that a contact group be established to provide advice on a model or framework for integrating the various information exchange requirements imposed by the Treaty, the Environmental Protocol, SCAR, and the Antarctic program managers council. Australia offered to coordinate an exchange of views among interested parties to identify and assess possible options. The matter was included on the tentative agenda for consideration at the next Consultative Meeting.

Liability for Damage to the Antarctic Environment — Article 16 of the Environmental Protocol calls upon the Parties to elaborate rules and procedures for determining liability for environmental damage arising from activities in the Antarctic Treaty Area. As noted in previous Commission reports, a series of meetings of legal experts has been held to discuss and attempt to reach agreement on (1) what

should be viewed as damage to the Antarctic environment and to dependent and associated ecosystems, (2) the types of damage for which Parties should be liable, (3) whether there should be any defenses or limits to liability, and (4) the mechanisms that might be used to determine damage and liability for damage.

At the Consultative Meeting in Norway in 1998 it was agreed that further consideration of these matters should be undertaken by a working group that meets during the Consultative Meetings with simultaneous interpretation in the four official Treaty languages (English, French, Spanish, and Russian). This working group, open to representatives from all of the Treaty Parties, met during the first week of the Consultative Meeting in Lima. As in the past, little progress was made toward reaching agreement on the various points noted above.

There was recognition that further work on preventive measures and response actions could help identify criteria that might be used to define damage and liability for damage to the Antarctic environment. Consequently the program managers council and SCAR were asked to present a joint paper to the next Consultative Meeting addressing the following five questions: (1) What criteria could be used to determine whether an impact causes harm to the environment?; (2) What is the scientific meaning of dependent and associated ecosystems?; (3) What, in the circumstances of Antarctica, are incidents that could cause environmental harm, distinguishing immediate harm from gradual or cumulative harm?; (4) Under what circumstances would it be possible and/or practicable to take containment, mitigation or clean-up action, and to restore the environment?; and (5) Is there an operational or scientific definition of the term “irreparable” and, if so, what criteria could be used to determine if harm is “irreparable?”

The “question of liability” was included on the preliminary agenda for the next Antarctic Treaty Consultative Meeting.

Operational Issues — Antarctic Treaty Consultative Meetings are organized and hosted by the Consultative Parties on a rotating basis. As noted earlier, information on member states’ activities in Antarctica is shared through an annual information exchange.

The number of Consultative Parties has increased from 12 to 27 since the Treaty entered into force in 1961. An additional 17 countries have acceded to the Treaty without seeking consultative status. As the number of Parties has increased, there has been growing awareness that organization of Consultative Meetings, exchange of information, and implementation of the Protocol on Environmental Protection could be enhanced by establishment of a small, permanent secretariat. Agreement in principle was reached at the 17th Consultative Meeting in 1992 on the need for and the functions of the secretariat. However, consensus on where the secretariat should be located has not been reached. It was agreed at the Lima meeting that, pending agreement on the location, work should proceed to reach agreement on the functions, composition, legal status, and funding of a permanent secretariat.

As noted earlier, Antarctic Treaty Consultative Meetings normally are organized and hosted by the Consultative Parties on a rotating basis. Poland was expected to host both the next Consultative Meeting and the next meeting of the Committee for Environmental Protection. At the meeting in Lima, the Polish delegation indicated that it had been unable to obtain the funding necessary to host the meetings in 2000, but might be able to do so in 2001. It was agreed that the United States, as the depository government for the Treaty, would consult the other Treaty Parties to try to find a volunteer to host a Consultative Meeting and a meeting of the Committee for Environmental Protection in 2000. At the end of the year, no party had offered to host the next meetings of either the Committee or the Consultative Parties.

Nongovernmental Activities in Antarctica

The Antarctic Science, Tourism, and Conservation Act of 1996 provides the statutory authority for the United States to implement the Protocol on Environmental Protection to the Antarctic Treaty. Among other things, the Act requires that the Environmental Protection Agency, the Coast Guard, and the National Science Foundation promulgate regulations to implement particular provisions of the Act.

The Environmental Protection Agency is responsible for promulgating regulations to provide for

assessment of the environmental impacts of nongovernmental activities, including tourism, for which the United States is required to give advance notice under paragraph 5 of Article VII of the Antarctic Treaty. The Agency also is responsible for promulgating regulations for coordinating review of information on environmental impact assessment, including draft comprehensive environmental evaluations, circulated by other Treaty Parties in accordance with Articles 3 and 6 of Annex I of the Environmental Protocol.

In 1996 the Environmental Protection Agency established an interagency group to help identify legal, policy, and practical matters meriting consideration in the development of the regulations. This group also has reviewed and provided comments on environmental impact assessments of nongovernmental activities planned to be carried out in the Treaty Area by U.S. entities during the 1997-1998, the 1998-1999, and the 1999-2000 austral summers. A member of the Marine Mammal Commission's staff represents the Commission on this interagency working group.

The Environmental Protection Agency published interim regulations for environmental impact assessment of nongovernmental activities in the *Federal Register* on 30 April 1997. At the request of the Antarctic tourist industry and environmental organizations, the interim regulations were extended to apply through the 2000-2001 austral summer. Notification of this extension was published in the *Federal Register* on 15 April 1998.

The interim regulations require that U.S. nongovernmental organizations planning to conduct activities in Antarctica provide appropriate impact assessment documentation to the Environmental Protection Agency at least 90 days before the planned commencement of the activity. All nongovernmental activities to date have required an initial environmental evaluation. In 1999 initial environmental evaluations were provided for the following activities:

- the Grand World Voyage aboard the MS *Rotterdam* to be conducted from 6 January to 11 April 2000 including scenic cruising in the Antarctic Peninsula area on 28-30 January 2000 (submitted by Holland; America Line-Westours Inc., Seattle, Washington);

- ship-based tours and landing of tourists at selected sites in the Antarctic Peninsula area planned to be conducted by eight U.S. tour operators from November 1999 through March 2000 (submitted by the International Association of Antarctica Tour Operators on behalf of Abercrombie & Kent/Explorer Shipping, Oak Brook, Illinois; Clipper Cruise Line, St. Louis, Missouri; Mountain Travel-Sobek, El Cerrito, California; Quark Expeditions, Darien, Connecticut; Society Expeditions, Seattle, Washington; Lindblad Special Expeditions, New York, New York; Zegrahm Expeditions, Seattle, Washington; and Expeditions, Inc., Bend, Oregon);
- ship-based tours of the Ross Sea area, including landings at several sites, to be carried out aboard the Russian icebreaker, *Kapitan Khlebnikov*, from 15 December 1999 to 1 February 2000 (submitted by Quark Expeditions, Darien, Connecticut);
- ship-based tours of the South Shetland Islands and sites on the Antarctic Peninsula to be conducted aboard the *M/V Marco Polo* from December 1999 through February 2000 (submitted by Orient Lines, Fort Lauderdale, Florida);
- filming a recreation of Sir Ernest Shackleton's 1914-1917 epic expedition (submitted by White Mountain Films, New York, New York); and
- research planned for the 1999-2000 austral summer to continue characterizing selected tourist visitor sites in the Antarctic Peninsula (submitted by Oceanites, Chevy Chase, Maryland).

In 2000 the Commission will continue to work with the Environmental Protection Agency, the Department of State, the National Science Foundation, other federal agencies, and the affected nongovernmental organizations to facilitate promulgation of final regulations. As possible, it also will help in implementing the provisions of the Protocol and the Antarctic Science, Tourism, and Conservation Act regarding prior assessment of the possible environmental impacts of activities in Antarctica.

Activities Related to Marine Living Resources

Fisheries began to develop in the Southern Ocean in the 1960s. Concern that these fisheries, particularly the fishery for Antarctic krill (*Euphasia superba*) — a key component in the diets of many whale, seal,

bird, and fish species — could adversely affect many non-target species, as well as the target species, led the Antarctic Treaty Consultative Parties to negotiate and adopt the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR). The Convention was concluded in May 1980 and entered into force in April 1982. Its objectives are to ensure that harvesting of marine living resources and associated activities in the Convention Area — the marine area south of the Antarctic Convergence — are carried out so as to (1) prevent harvested populations from being reduced or maintained below their maximum net productivity levels; (2) maintain the ecological relationships among harvested, dependent, and related populations; and (3) minimize the risk of changes in the Antarctic marine ecosystem that are not potentially reversible in two or three decades — *i.e.*, to maintain the fullest possible range of management options for future generations.

The Convention established the Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources. These bodies meet annually to identify and take such actions as are necessary to meet the Convention objectives. The Marine Mammal Commission's involvement in negotiating the Convention and the first 17 meetings of the Commission and Scientific Committee are described in previous annual reports. The 18th annual meetings of the Commission and Scientific Committee were held in Hobart, Tasmania, Australia, 25 October-5 November 1999. The principal results are described below.

[Meeting reports and other information concerning the Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources can be obtained from the Commission Secretariat, P.O. Box 213, North Hobart, Tasmania 7002, Australia.]

Fisheries Managed under the Convention — Vessels from 15 member countries participated in CCAMLR-managed fisheries in the 1998-1999 season (1 July 1998 to 30 June 1999). The principal species harvested were Antarctic krill, Patagonian toothfish (*Dissostichus eleginoides*), Antarctic toothfish (*D. mawsoni*), and mackerel icefish (*Champscephalus gunnari*).

The reported krill catch in the 1998-1999 season was 103,318 metric tons (mt) compared to 80,802 mt reported caught in 1997-1998. The catch was taken by vessels from Argentina, Japan, Poland, the Republic of Korea, and the Ukraine, mostly in the areas around the South Shetland, South Orkney, and South Sandwich Islands (north and east of the Antarctic Peninsula). The representatives of these countries indicated that they expected their fishing effort to be similar in 1999-2000. Argentina, Germany, Russia, Uruguay, and the United States indicated that vessels from their countries also could participate in the krill fishery in 1999-2000.

The reported catch of finfish in the Convention Area in the 1998-1999 split-year season was 18,006 mt, 17,435 mt of which was Patagonian or Antarctic toothfish, marketed in the United States as Chilean sea bass. In comparison, the total reported finfish catch in 1997-1998 was 11,419 mt.

Vessels from 10 member states and an uncertain number of non-member states participated in the toothfish fisheries in 1998-1999. The member states were Argentina, Australia, Chile, France, New Zealand, the Republic of Korea, South Africa, Spain, the Ukraine, and the United Kingdom. The non-member states included Belize, Panama, and Portugal, a member of the European Community, which is a party to the Convention.

Illegal, Unreported, and Unregulated Fishing — As the name implies, Patagonian toothfish occur and are harvested on the Patagonian shelf off Argentina and Chile and on other shelf areas in the Southern Hemisphere, as well as in the Convention Area. The fish has high market value and is being targeted both inside and outside the Convention Area. Illegal catches by vessels from member states and unreported catches by vessels from non-member states inside the Convention Area are thought to be substantially greater than the reported catches.

The illegal, unreported, and unregulated fishing for toothfish in the Convention Area is of great concern to the United States and the other members of the Commission for the Conservation of Antarctic Marine Living Resources. To try to address the problem, the Commission has adopted conservation measures that

(1) require Parties to the Convention to prohibit fishing by their flag vessels in the Convention Area except in accordance with a license or permit that specifies when and where fishing is allowed, the gear that can be used, reporting requirements, etc.; (2) establish precautionary catch limits for all parts of the Convention Area where fishing for toothfish is known to be occurring; (3) require that Party vessels fishing for toothfish in the Convention Area carry observers designated in accordance with the CCAMLR System of Observation and Inspection; (4) call upon Parties to inspect and prohibit landings of toothfish in their ports by vessels from non-contracting Parties sighted fishing in the Convention Area; and (5) require that Parties establish and use an automated satellite-linked tracking system to monitor the positions of their fishing vessels authorized to fish in the Convention Area for which catch limits, fishing seasons, or area restrictions have been set by the Commission.

As noted in the Marine Mammal Commission's previous report, the United States proposed at the 1998 meeting of the Commission for the Conservation of Antarctic Marine Living Resources that a system be established to track toothfish caught in the Convention Area and landed in the ports or transhipped to the vessels of contracting parties, or imported into the member states. This proposal was refined at an intersessional meeting in Brussels in April 1999, and led to adoption at the 1999 Commission meeting of a catch documentation scheme for *Dissostichus spp.* (Conservation Measure 170/XVIII). The system, which becomes binding on member states in May 2000, requires that each time the vessel of a contracting party lands or tranships toothfish, the master of the vessel is to provide with the fish a signed document that identifies (1) the name, address, telephone and fax numbers of the national authority responsible for issuing the catch documentation forms; (2) the name, home port, national registry number, and call sign of the vessel; (3) the number of the license or permit issued to the vessel by the contracting party; (4) the weight of each *Dissostichus spp.* landed or transhipped by product type and location of the catch; (5) the dates during which the fish were caught; (6) the date and the port at which the catch was landed, or the date and the vessel to which the catch was transhipped; and (7) the name, address, telephone and fax numbers of the receiver or receivers of the catch

and the amount of each species and product type received by that entity. Each contracting party is required to ensure that each shipment of toothfish imported into its territory is accompanied by a validated catch document or documents that account for all of the fish in the shipment.

Planned Synoptic Survey of Krill in Statistical Area 48 — Most of the Antarctic krill taken from the Convention Area has been taken from the waters surrounding the South Shetland, South Orkney, and South Sandwich Islands (CCAMLR statistical area 48). A precautionary catch limit for the area has been established based on a synoptic survey done in 1982, a year when krill abundance in the area appears to have been unusually high. Recognizing this, the United States proposed that a synoptic survey of krill in statistical area 48 be carried out as a matter of priority. Preliminary plans for the survey were developed at a workshop hosted by the United States at the National Marine Fisheries Service's Southwest Fisheries Science Center in La Jolla, California, in June 1998. Final plans were developed at a meeting held in the United Kingdom in March 1999. The survey, to be conducted in January and February 2000, will involve vessels from four countries: Japan, Russia, the United Kingdom, and the United States. A two-week workshop is to be held in La Jolla in May-June 2000 to analyze the results. Survey analyses will be presented later in the year to the Scientific Committee and its subsidiary bodies and will be used to advise the Commission of catch limits in the area that would be appropriately precautionary.

Assessment and Avoidance of Incidental Mortality — Many species of marine mammals, seabirds, and turtles, as well as non-target fish species, are caught and killed incidental to commercial fisheries throughout the world. Many also are caught and killed in lost and discarded fishing gear and die from eating plastics and other non-digestible items discarded at sea.

The Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources have recognized this problem and, since the early 1980s, have taken steps to assess and prevent such fishery-related mortality in the Convention Area. As examples, operators of fishing vessels are required to report lost fishing gear and incidental catches of

marine mammals, seabirds, and other non-target species. Placards and information brochures have been developed and provided to vessel operators to ensure that their crews are aware of hazards posed by lost and discarded fishing gear and other potentially hazardous materials, and to advise them of what they can do to prevent such materials from being lost and discarded at sea. To prevent seabirds from being attracted to and caught on baited hooks, the Commission, acting on the advice of the Scientific Committee, has adopted measures requiring that longlines be set only at night, that the use of lights be kept to a minimum when setting and retrieving longlines, that streamers be towed above longlines as they are set to discourage birds from attempting to take bait, and that offal from fish processing not be discarded when longlines are being set and retrieved or, if that is impractical, be discarded from the opposite side of vessels from which longlines are deployed.

Beach surveys carried out in parts of the Convention Area by several Parties during the 1998-1999 austral summer again found substantial quantities of marine debris originating from fishing vessels. The specific origin of this debris is uncertain. Therefore, the Commission requested that observers deployed on fishing vessels in accordance with the CCAMLR System of Observation and Inspection be instructed to gather data on garbage disposal and loss of gear by fishing vessels. Member states also were urged to ensure that their fishing vessels comply with the requirements of Annex IV, concerning prevention of marine pollution, to the Protocol on Environmental Protection to the Antarctic Treaty.

Data provided to and analyzed by the Scientific Committee in 1999 indicated that the bycatch of seabirds in regulated longline fisheries in the Convention Area has continued to decline due to (1) the delay in the start of the fishing season until the end of the breeding season for most albatross and petrel species, and (2) better compliance with the requirements that streamers be used to discourage birds from attempting to take bait from hooks as longlines are deployed and that offal not be dumped while longlines are being set and retrieved. Further, there have been few reports of incidental mortality of seabirds and marine mammals in trawl fisheries in the Convention Area since use of net monitoring cables was prohibited. Recog-

nizing that discharge of offal and use of lights could attract marine mammals and seabirds and make them more vulnerable to catch in trawl fisheries, as well as longline fisheries, the Living Resources Commission adopted a conservation measure requiring that lighting and discharge of offal in trawl fisheries be structured, as in longline fisheries, to minimize the incidental mortality of seabirds and marine mammals.

Although the various conservation measures have resulted in a substantial decline in the incidental take of seabirds and marine mammals by vessels licensed and permitted by the contracting parties to fish in the Convention Area, it is unlikely that vessels from non-contracting parties and vessels from contracting parties fishing illegally in the Convention Area are complying with these conservation measures. Thus, the incidental take of both seabirds and marine mammals may be underestimated and, in some cases, may be unsustainable and causing population declines.

One of the purposes of the catch documentation scheme described earlier is to reduce and eventually eliminate illegal, unregulated, and unreported fishing in the Convention Area. Until this goal is accomplished, there can be no assurance that incidental mortality is not jeopardizing the affected seabird and marine mammal species.

U.S. Antarctic Marine Living Resources Research Program

The Antarctic Marine Living Resources Convention Act of 1984 provides the legislative authority necessary for the United States to implement the Convention on the Conservation of Antarctic Marine Living Resources. Among other things, the Act directs 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, to prepare, implement, and annually update a plan for directed research necessary to effectively implement the Convention. The Secretary of Commerce has delegated responsibility for designing and conducting this directed research program to the National Marine Fisheries Service. The Service in

turn has assigned program responsibility to its Southwest Fisheries Science Center in La Jolla, California.

[Information on this program and related matters can be obtained from the Chief, Antarctic Ecosystem Research Group, Southwest Fisheries Science Center, P.O. Box 271, La Jolla, California 92038.]

The principal elements of the National Marine Fisheries Service's directed research program are (1) shipboard studies to document and monitor changes and trends in krill distribution, abundance, age structure, and related oceanographic conditions in the South Shetland Islands area (*i.e.*, the waters around Elephant, King George, and Livingston Islands); (2) trawl surveys to document the distribution, abundance, and trends of bottomfish in the waters around the South Shetland and South Orkney Islands; and (3) land-based studies of penguins and pinnipeds that could be affected indirectly by krill harvesting in the area around the South Shetland Islands. Additional land-based studies of penguins are carried out cooperatively with National Science Foundation grantees on Torgersen Island, adjacent to Palmer Station on Anvers Island.

Since 1996 shipboard studies have been conducted during the austral summer aboard the Russian research vessel, *R/V Yuzhmorgeologiya*, chartered by the National Marine Fisheries Service. Krill biomass estimates have been derived from these and earlier surveys near Elephant Island for the austral summers of 1992 and 1994 through 1999. In 1999 the biomass estimate declined for the third year in a row and was the second lowest in the seven-year time series.

The land-based studies of penguins and pinnipeds were conducted in 1999 at Cape Shirreff on Livingston Island. Previously, the land-based studies had been conducted at Seal Island, off the northwestern coast of Elephant Island. The studies at Seal Island were discontinued in 1997 because of the possibility of landslides destroying the facilities there. The studies at Cape Shirreff were conducted from 25 November 1998 to 26 February 1999.

The number of Antarctic fur seal pups born at Cape Shirreff increased in 1998-1999 compared to the previous year. Return rates for adult female and

yearling fur seals suggested good over-winter survival. The average length of the first six trips to sea by post-parturient females was greater in 1998-1999 than in 1997-1998. The difference, however, was due to the first two trips being longer in 1998-1999 than in 1997-1998. The difference may not have been due to a difference in the early season foraging environment. Females of similar length had less mass in 1998-1999 compared to the previous year, suggesting that the early season difference in trip length may have been due to a difference in arrival condition at the start of the pupping season. The mean parturition date for females in 1998-1999 was earlier than in 1997-1998, and subsequent foraging cycles in 1998-1999 were started earlier than in 1997-1998. There were no between-year differences in foraging trips three through six. Foraging location and trip duration changed from January to February. Females foraged much closer to Cape Shirreff in February than in January. Trip duration was shorter in February than in January, and they shifted from krill in January to a higher percentage of fish and squid in February.

Basic Marine Research in the Antarctic

The National Science Foundation's Office of Polar Programs has lead responsibility for U.S. government programs in the Antarctic. The Antarctic Marine Living Resources Convention Act of 1984 directs the Foundation to continue to support basic marine research in the Antarctic, as well as directs the Department of Commerce to conduct a directed research program in support of the Convention on the Conservation of Antarctic Marine Living Resources. As noted in previous annual reports, the National Science Foundation and the National Marine Fisheries Service have cooperatively supported several long-term research programs related to the Convention.

The complementary basic research supported by the National Science Foundation has included (1) the multidisciplinary, long-term ecological research program in the area around Palmer Station on Anvers Island, and (2) individual research projects in diverse scientific disciplines, including the biology, physiology, and ecology of seals, penguins, fish, and other marine species. In 1999 the Foundation provided support for a multidisciplinary study of seals that inhabit the Antarctic pack ice. The field aspects of

the program, which began in December 1999, are being carried out aboard the *R/V N.B. Palmer*. The program includes studies to document the distribution, abundance, feeding habits, general body condition, nutritional status, genetic relationships, and immunogenetics of crabeater, leopard, Weddell, and Ross seals that occur in the pack ice. It also includes studies of sea ice and hydrography, and corollary studies of seabirds, fish, squid, krill, and other zooplankton. The studies are being conducted by scientists from a broad range of organizations including the National Marine Mammal Laboratory, the University of Alaska, Hubbs Sea World Research Institute, the University of Minnesota, the University of Southern California, and Scripps Institution of Oceanography.

[Information concerning these programs can be obtained from the Manager, Antarctic Biology and Medicine Program, National Science Foundation, Office of Polar Programs, 4201 Wilson Boulevard, Arlington, Virginia 22230.]

The Arctic Council

Many species of marine mammals live seasonally or year-round in the Arctic Ocean and adjacent seas and coastal areas. They include polar bears; walrus; ringed, bearded, harp, hooded, ribbon, and spotted seals; narwhals; and bowhead, minke, fin, gray, and beluga whales. The ranges of most of these species cross international borders. Consequently, effective conservation of these species and their habitats requires cooperation among the Arctic nations.

Some species of marine mammals are important components of the cultures and diets of Alaska Natives and other Arctic residents. Congress recognized the importance of marine mammals to Alaska Natives when it enacted the Marine Mammal Protection Act of 1972. Section 101(b) of the Act exempts Alaska Natives from the Act's moratorium on the taking of marine mammals, provided the taking is not wasteful and is done for subsistence purposes or to create and sell authentic Native articles of handicraft and clothing. In 1994 Congress added section 119 to the Act, explicitly authorizing and encouraging the Secretaries

of Commerce and the Interior to develop agreements with Alaska Native groups to cooperatively manage species and populations of marine mammals that are important to Native subsistence and cultures.

Some species of marine mammals that occur in the Arctic, such as polar bears, walruses, harp seals, and bowhead whales, have been hunted commercially, as well as for subsistence. Commercial hunting was, in some cases, poorly regulated and resulted in over-exploitation and depletion of many stocks.

Other human activities in the Arctic, such as coastal and offshore oil and gas development, also may have adverse effects on marine mammals and their habitats. In addition, marine mammals and other components of Arctic food webs, including people who rely on fish and wildlife for subsistence purposes, may be affected by human activities outside the Arctic. For example, recent studies indicate that a variety of persistent organic compounds and other pollutants originating from human activities in the middle latitudes are being transported by air and water currents to the Arctic and may be adversely affecting humans, marine mammals, and other components of Arctic ecosystems.

This section provides background information and describes the Commission's efforts in 1999 to facilitate the work of the Arctic Council, established by the Arctic nations in 1996 as a successor to the Arctic Environmental Protection Strategy adopted in 1991.

Establishment of the Council

In September 1989 representatives of the eight Arctic countries — Canada, Denmark (for Greenland), Finland, Iceland, Norway, the Soviet Union, Sweden, and the United States — met in Rovaniemi, Finland, to discuss cooperative measures to protect the Arctic environment. The principal impetuses for this meeting were the Chernobyl nuclear accident and pollution from Russian mining activities near the Finnish border, both of which created a desire to help the Soviet Union (later the Russian Federation) address a number of environmental problems that had become evident in the *glasnost* era.

In June 1991 ministers from the eight Arctic countries signed the Declaration on the Protection of the Arctic Environment. At the same time, they adopted the Arctic Environmental Protection Strategy. The goals of the strategy were to preserve the environmental quality and natural resources of the Arctic, monitor and reduce pollution affecting the Arctic environment, and accommodate the traditional subsistence and cultural needs and practices of indigenous people insofar as these relate to the environment and natural resources of the Arctic.

The strategy called for cooperation in four program areas: assessment and monitoring of environmental pollutants; conservation of Arctic flora and fauna; emergency prevention, preparedness, and response; and protection of the Arctic marine environment. Working groups were established to recommend and oversee cooperative activities in these four program areas. In 1994 a task force was established to address issues of sustainable development and utilization of Arctic resources.

Senior government officials from the eight Arctic countries have met periodically to review the actions of the working groups and to identify additional cooperative efforts necessary to effectively implement the Arctic Environmental Protection Strategy. Ministerial-level meetings were held in 1993, 1996, and 1997 to receive reports from the working groups and the senior Arctic officials and to provide direction to these groups.

As noted in previous Commission reports, some of the Arctic countries believed that a more formal intergovernmental organization was needed to effectively implement the Arctic Environmental Protection Strategy and to provide a forum for addressing other issues of regional concern, such as health, education, and economic development. In March 1995 Canada proposed the establishment of an intergovernmental Arctic Council. The other Arctic countries agreed that a high-level intergovernmental forum would help to implement the Arctic Environmental Protection Strategy and to address other issues of mutual interest, but there was no consensus that a formal intergovernmental organization was necessary.

Representatives of the Arctic countries met in 1995 and 1996 to draft a declaration establishing the Arctic Council, as has been described in previous Commission reports. The Declaration on the Establishment of the Arctic Council was concluded and signed in September 1996. The declaration states that the Arctic Council is established as a high-level forum to (a) provide a means for promoting cooperation, coordination, and interaction among the Arctic countries, with the involvement of Arctic indigenous people and other Arctic residents on issues of common interest and concern, in particular issues related to environmental protection and sustainable development in the Arctic; (b) oversee and coordinate the programs established under the Arctic Environmental Protection Strategy; (c) adopt terms of reference for and oversee and coordinate a sustainable development program; and (d) disseminate information, encourage education, and promote interest in Arctic-related issues. Among other things, the declaration specifies that:

- the Council should normally meet biennially, with meetings of senior officials taking place more frequently to provide for liaison and coordination;
- responsibility for hosting meetings of the Council, including provision of secretarial support, should rotate sequentially among the Arctic countries;
- as its first order of business, the Council should adopt rules of procedure for its meetings and those of its working groups; and
- decisions of the Council are to be made by consensus of its members (*i.e.*, the eight Arctic nations).

Three organizations representing Arctic indigenous people were recognized as permanent participants under the Arctic Environmental Protection Strategy and were entitled to send representatives to all ministerial, senior official, and working group meetings. They are given the same status under the Arctic Council. These organizations are the Inuit Circumpolar Conference, the Saami Council, and the Association of Indigenous Peoples of the North, Siberia, and the Far East of the Russian Federation. The Arctic Council also provides for other organizations to be granted the same status, and at the first meeting of the Council, held in Iqaluit, Canada, in September 1998, the Aleut International Association was recognized as a permanent participant. Other actions taken by the

Council at its first meeting are described in the Commission's previous annual report.

Arctic Council Activities in 1999

Following the September 1998 meeting, the United States assumed the chairmanship of the Council until the close of the next ministerial meeting, scheduled for October 2000. In 1999 two meetings of the senior Arctic officials were held, one in Anchorage, Alaska, in May and one in Washington, DC, in November. The Marine Mammal Commission worked with the Department of State, other federal agencies, and the Alaska Governor's office to develop U.S. positions for these meetings. The Commission contracted with an independent scientist familiar with the work of the Arctic Council to represent the Commission on the U.S. delegations to both meetings. The contractor's reports (Appendix B, Huntington 1999a, 1999b) noted that the Arctic Council is making progress in developing a productive system of operation, although more time is required to resolve some of the matters concerning the efficiency and effectiveness of the organization and its subsidiary bodies.

The Sustainable Development Program — One of the most significant developments in 1999 involved the meetings of the Sustainable Development Working Group, established by the Council in 1998 following adoption of terms of reference for the Sustainable Development Program. The working group, comprised of the senior Arctic officials designated by the eight Arctic nations, is responsible for (1) facilitating preparation of development-related proposals for consideration by the Council, (2) recommending to the Council projects that appear to merit consideration, and (3) overseeing implementation of projects approved by the Council.

At the Arctic Council ministerial meeting in September 1998 three sustainable development projects were approved and are being carried out under the aegis of the Sustainable Development Working Group. They are (1) a U.S.-led project on the development of a tele-medicine network throughout the Arctic; (2) a Saami Council-led project on freshwater and coastal fisheries; and (3) a Canadian-led project on the future of youth and children in the Arctic.

During the meeting of the working group in Anchorage in May 1999 several countries pressed for the development of a strategic framework to guide and establish priorities for development-related activities in the Arctic. The United States, as the current chair of the working group, agreed to draft a brief framework document outlining the terms of reference for the sustainable development program and the areas of current focus. At the end of the year, the draft was being revised to take into account comments received during and following the senior Arctic officials meeting in Washington, DC. It is expected that a framework agreeable to all parties can be adopted by the Council at its meeting in October 2000.

The Arctic Monitoring and Assessment Program — The Working Group for the Arctic Monitoring and Assessment Program is charged with reporting on levels, effects, and sources of environmental pollutants in the Arctic. The National Oceanic and Atmospheric Administration has lead responsibility for U.S. participation in the working group.

In 1997 the working group delivered a report, entitled *Arctic Pollution Issues*, to the ministers of the Arctic Environmental Protection Strategy at their meeting in Alta, Norway. The report was a non-technical description of what is currently known about a wide range of pollutants and their effects on the environment and on human health in the Arctic. The full scientific report was delivered to the Arctic Council in September 1998. This report, *The AMAP Assessment Report*, is a comprehensive summary of pollution issues in the Arctic through 1997.

In response to the recommendations contained in the published reports, the working group was instructed by the Arctic Council to produce assessments on a number of specific pollution-related subjects. The assessments will update information on the topics covered in the initial reports and also will address emerging topics, such as the anti-fouling paint additive tributyltin, that were not covered in the initial reports. To continue planning for and begin conducting these assessments, the working group met once in 1999 and held meetings of its subsidiary assessment steering group and assessment steering committee. The Commission was not represented at these meetings.

The findings of the Arctic Monitoring and Assessment Program are of interest and concern to the Commission because pollutant levels in several marine mammal species found in the Arctic appear high and may be affecting both the animals and the health of Alaska Natives who consume them. These and other concerns regarding the effects of pollutants on marine mammals were considered during the October 1998 Workshop on Marine Mammals and Persistent Ocean Contaminants, described in Chapter VII.

Another topic of great concern to the Commission is climate change and its possible effects on the Arctic environment. Alaska Natives have expressed concerns about observed changes in sea ice and the condition of marine mammals in the Arctic. As described in Chapter IX, the Commission has worked with representatives of Alaska Native communities to convene a workshop, to be held in Alaska in February 2000, to evaluate information on the nature and causes of sea ice change and how it may affect Native communities in Alaska and elsewhere that depend on marine resources. Further, the Arctic Council has directed the Arctic Monitoring and Assessment Program Working Group to work with the Conservation of Arctic Flora and Fauna Working Group to assess the effects of climate change on Arctic ecosystems. The working groups, in cooperation with the International Arctic Science Committee, have developed a proposal for an Arctic Climate Impact Assessment, which the Arctic Council is expected to approve at its October 2000 meeting. The proposed assessment will address climate change, ozone depletion, and ultraviolet radiation and their impacts on the Arctic environment, human health, and human activities.

Conservation of Arctic Flora and Fauna — The Working Group on Conservation of Arctic Flora and Fauna provides a distinct forum for scientists, indigenous people, and conservation managers to exchange data and information on issues of mutual interest and concern regarding the biology, ecology, and utilization of fish, wildlife, forests, etc., in the Arctic. The Alaska Office of the U.S. Fish and Wildlife Service has lead responsibility for U.S. participation in the working group.

As noted in previous annual reports, the working group has made significant progress in a number of

areas. Its efforts to develop a more cohesive approach to its work through the use of its "Strategic Plan for the Conservation of Arctic Biological Diversity" appear to be paying off. This plan emphasizes five objectives: enhancing efforts to monitor Arctic biodiversity; conserving Arctic genetic resources, species, and their habitats; establishing protected areas as needed; managing activities outside protected areas; and providing conservation information to those making socioeconomic decisions.

The Conservation of Arctic Flora and Fauna Working Group met once in 1999. The previously noted Commission contractor attended this meeting. In his report to the Commission (see Appendix B, Huntington 1999b), the contractor noted that the working group appears to be improving the efficiency and effectiveness of its work and that its plans for further activities are better coordinated than in the past. Among other things, the working group is planning workshops to address circumpolar marine conservation issues and biodiversity monitoring. As directed by the Arctic Council ministers, the working group is preparing a report on the status of Arctic flora and fauna, which will highlight key issues and provide background information necessary for identifying conservation needs, planning conservation measures, and assessing their effectiveness.

As noted in its previous annual report, the Commission wrote to the National Marine Fisheries Service on 23 December 1997 recommending that the Service consider asking the working group to develop a plan for assessing and monitoring the status and trends of ringed and bearded seals throughout the Arctic. In response, the Service prepared a discussion paper outlining steps that possibly could be taken collectively by the Arctic countries to better determine and monitor the status of these species. The paper was presented to the members of the Conservation of Arctic Flora and Fauna Working Group prior to its

meeting in Yellowknife, Canada, in April 1999. Although some countries thought that the concept should be broadened to include additional species, such as harp and hooded seals, it was agreed that the possibilities should be considered further.

Coordinating U.S. Involvement in Arctic Activities

In the United States, the Department of State has lead responsibility for developing and overseeing implementation of U.S. policy regarding the Arctic. To help meet this responsibility, U.S. positions regarding policy-related matters to be considered at working group, senior Arctic official, and ministerial meetings are developed through an interagency Arctic Policy 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 National Science Foundation, and the Departments of Commerce, Defense, Energy, the Interior, and Transportation. Representatives of the State of Alaska, Alaska Native organizations, industry, and public interest groups are consulted to assist in developing policies regarding issues that affect them.

Federal agency interest and contributions to the work of the Arctic Council are increasing, due in part to growing recognition of both the global and regional importance of the issues and the increased visibility associated with the United States hosting and chairing the Council. The Commission will continue to take part in domestic discussions of Arctic Council issues, to send representatives to working group and other meetings under the Arctic Council bearing on the conservation and protection of marine mammals and their habitats in the Arctic, and to make recommendations as appropriate concerning the organization and content of work under the Arctic Council.

Chapter VI

MARINE MAMMAL MORTALITY EVENTS

In the past 20 to 25 years, there appears to have been an increase in the frequency and scale of unusual marine mammal mortalities. There also appears to have been an increase in unexplained marine mammal population declines, such as those involving sea otters in Alaska and California, described in Chapter III. Additionally, there appears to have been a general increase in the number of dead marine mammals washing up on shore in some coastal areas. For example, the number of dead marine mammals found on beaches in the southeastern United States has doubled since the mid-1980s. It is not known, however, whether these increases are due to better reporting, actual increases in the number of deaths, or some combination of factors.

Unusual marine mammal mortality events in the United States over the past 25 years have involved a broad range of species in widely separated geographic areas. They have included monk seals in the Northwestern Hawaiian Islands; harbor seals, humpback whales, white-sided dolphins, and harbor porpoises in New England; sea lions and gray whales on the Pacific coast; bottlenose dolphins along the east and Gulf of Mexico coasts; and manatees in Florida.

Similar events also have occurred elsewhere in the world. More than 17,000 harbor seals died in the North Sea late in 1988; more than 1,000 striped dolphins died in the Mediterranean Sea in 1990-1991; as many as 200 Mediterranean monk seals died off the northwestern coast of Africa in 1997; and more than 1,600 New Zealand (Hooker's) sea lions died on the Auckland Islands, south of New Zealand, in January-February 1998. The deaths of abnormal numbers of Florida manatees, Mediterranean monk seals, and New Zealand sea lions demonstrate the potentially devastating impact that unusual mortality events can have on endangered and threatened species.

Several of the recent mortality events are believed to have been caused by morbilliviruses, congeners of which cause distemper in dogs, measles in humans, and rinderpest in hoofed mammals. It is not known whether cetaceans and pinnipeds have been exposed to these viruses only recently, and thus have no acquired immunity to them, or whether more virulent forms of the viruses have evolved. Further, it is not known whether animals in the affected populations had been stressed in ways that could have compromised their immune systems or whether there simply are better means now than in the past for detecting both viruses and unusual mortality events.

High levels of several environmental contaminants were found in the blubber, livers, and other tissues of some of the bottlenose and striped dolphins that died during the unusual mortality events noted above. These contaminants may have affected the animals' immune systems and made them more vulnerable to the virus. Currently, however, available information is insufficient to determine how, at what levels, or in what combinations environmental contaminants may compromise the immune systems or otherwise affect various species and age/sex classes of marine mammals. As noted in its previous annual report, the Commission, in cooperation with the National Marine Fisheries Service, the U.S. Geological Survey, the Environmental Protection Agency, and the National Fish and Wildlife Foundation, held a workshop in October 1998 to better document and determine how to resolve the most critical uncertainties concerning contaminant effects. As discussed in Chapter VII, the Commission has provided the workshop report (see Appendix B, O'Shea *et al.* 1999) to scientists and organizations with related interests and responsibilities worldwide and has recommended that the National Oceanic and Atmospheric Administration establish an interagency working group to promote and coordinate efforts necessary to resolve the uncertainties.

At least two of the unusual events noted above were caused by naturally occurring toxins. The humpback whales that died in Cape Cod Bay (Massachusetts) in November 1987 did so after eating mackerel containing saxitoxin, a neurotoxin produced by the dinoflagellate that causes paralytic shellfish poisoning in humans. The deaths of manatees along the west coast of Florida in 1996 were caused by exposure to brevetoxin, a toxin produced by *Gymnodinium breve*, the organism that causes red tides. The unusually high mortality of bottlenose dolphins along the northwestern coast of Florida in 1999 (described below) also appears to have been caused by one or more blooms of toxic algae.

Toxic algal blooms appear to be occurring more frequently in many parts of the world, triggered perhaps by pollution or other environmental changes.

Unusual Mortality Events in 1999

Three unusual marine mammal mortality events occurred wholly or partially in U.S. waters in 1999. They involved harbor porpoises along the northeastern and mid-Atlantic coast, gray whales along the west coast, and bottlenose dolphins in the panhandle region of Florida.

Harbor Porpoises

During the 25-26 March 1999 meeting of the Working Group on Marine Mammal Unusual Mortality Events discussed below, the group was advised that 59 harbor porpoises, including 11 that were alive, had stranded along the east coast from Massachusetts to North Carolina since the beginning of the year. Although the number of strandings was higher than in past years and many of the animals were young and thin, the working group thought that both the numbers and the predominance of young animals could be within the range of normal variation. The group therefore believed that the situation should be monitored but that it was not an unusual mortality event.

In early May 1999 the Commission learned that the higher-than-normal stranding rate was continuing and that the Working Group on Marine Mammal Unusual

Mortality Events had not been consulted after the March meeting to determine whether the apparent increase in strandings should be viewed as an unusual event and, if so, what it believed should be done to determine the cause, magnitude, and measures that might be taken to minimize or mitigate the effects of the event. Therefore, by letter of 17 May 1999 the Commission recommended that the National Marine Fisheries Service immediately ask the working group for its advice on these matters and, if the working group concluded that the increase in strandings should be viewed as an unusual event, (1) designate an appropriately qualified individual to coordinate the response, and (2) make funding, personnel, ships, and aircraft available to carry out an appropriate response.

The Service initiated consultations with the members of the working group on 25 May 1999. The group was advised that, since the beginning of the year, there had been 216 strandings of harbor porpoises reported along the east coast from Maine to North Carolina and that the highest numbers reported during this time period in previous years were 103 in 1977, 91 in 1994, and 75 in 1997. The group also was advised that (1) the greatest increase had been in Massachusetts in February and March and in Maryland, Virginia, and North Carolina in March and April; (2) a number of the porpoises, particularly those that stranded in Massachusetts, were emaciated subadults, suggesting that reduced food availability may have been a factor in at least some of the strandings; (3) excluding the strandings in Massachusetts, 33 (60 percent) of 55 strandings fresh enough to find indications of interactions with fisheries had marks suggesting that they had been caught in or cut from nets; and (4) there had been only six strandings since 10 May, suggesting that the higher-than-normal rate of strandings had ended.

The Service advised the Commission by letter of 24 June 1999 that (1) the working group had been consulted and had advised the Service that, while there was reason for concern, the fact that animals had died from a number of causes, including entanglement in fishing gear, indicated that the increase in strandings did not constitute an unusual event; and (2) the Service consequently had decided not to appoint an on-site coordinator. The Service also advised the Commission that the working group had recommended

that it continue to monitor and conduct analyses to determine the causes of harbor porpoise mortalities and that the Service intended to do so.

Gray Whales

From 1 January to 1 October 1999, 273 gray whales were found stranded along the west coast of North America. Most of the whales were found dead and in various stages of decomposition. The highest number of reported strandings was in Mexico (118), followed by Alaska (73), California (42), Washington and Oregon (30), and Canada (10). By comparison, the highest number of strandings in the preceding nine years was 87 — 45 in Mexico, 15 in California, 14 in Alaska, and 13 in Washington and Oregon. Of 109 animals for which sex was determined, 74 (68 percent) were female and 35 (32 percent) were male. Of 175 animals for which length was measured, 125 (71 percent) were adults or subadults, 36 (21 percent) were juveniles, and 14 (8 percent) were calves. It is not known how many animals died and either decomposed at sea or were stranded and not found.

A number of the animals that stranded, as well as some live animals sighted and photographed offshore during the fall migration from the Bering Sea to the calving grounds in Baja California, Mexico, were emaciated, suggesting some type of nutritional problem. Concentrations of PCBs and DDT found in the blubber of the animals sampled were highly variable, ranging from 47 to 2,100 ng/g for total PCBs, and 15-770 ng/g for DDT and its derivatives.

During the annual meeting of the Commission and its Committee of Scientific Advisors on 19-21 October 1999 representatives of the Service reviewed what had been and was being done to document and determine the cause or causes of the unusually high number of deaths throughout the year. The Commission was advised that the Working Group on Marine Mammal Unusual Mortality Events had been consulted in July 1999, shortly after the high rate of strandings had become apparent, and had advised that the strandings should be investigated as an unusual mortality event. The Commission also was advised that the Service had contracted with an appropriately qualified individual to collect and compare data from the 1999 strandings with data from strandings in previous years and that

the results of the analysis would not be available before the end of December — by which time in 1998 the increase in strandings had already begun — and that the contractor's report would not be considered by the Working Group on Marine Mammal Unusual Mortality Events until its next scheduled meeting in April 2000.

Recognizing that the unusually high number of deaths could continue and that the schedule outlined by the Service at the Commission's meeting would not lead to timely development of a response plan, the Commission recommended by letter of 10 December 1999 that the Service take such steps as necessary to have a response plan in place by the end of the year. As noted in the gray whale section in Chapter III of this report, the Commission also recommended in its letter that the Service (1) continue to conduct adult and calf counts and photogrammetry studies during the northbound migrations for at least the next three years (2000, 2001, and 2002) to determine if significant changes occur in calf production or the size and condition of individual animals; (2) conduct a count during the southbound migration in 2001 to determine whether the increasing trend in total abundance continues; and (3) continue to assist efforts by Mexican scientists to prevent degradation of the critical breeding and calving lagoons in Baja California.

By the end of the year, the Service had not yet responded to these recommendations.

Bottlenose Dolphins

Between 8 August and 31 October 1999, 68 bottlenose dolphins stranded on beaches in and near Saint Joseph and Saint Andrews Bays on the Florida panhandle. Most of the animals were in advanced stages of decomposition, suggesting that they had died somewhere offshore and had been in the water three or more days before stranding. Early in December, high numbers of strandings began to occur again farther west in the more enclosed Choctawhatchee Bay, and by year's end, an additional 19 animals had stranded there. In previous years, fewer than 10 dolphins had stranded in these areas in the fall and early winter. Yearly totals for the panhandle area have been less than 36, with most animals stranding in February and March.

Large numbers of fish, birds, and turtles also have died in these areas. Blooms of *Gymnodinium breve*, the dinoflagellate that produces brevetoxin, also have been present in these areas, suggesting that the blooms are responsible for the deaths. Histologic and spectrographic studies funded by the National Marine Fisheries Service found lesions in the upper respiratory tracts and evidence of brevetoxin in the stomach contents, livers, and kidneys of several dolphins.

At the end of 1999 the locations and densities of the toxic algal blooms were being monitored, and additional tissue samples were being collected and analyzed to confirm that the deaths were caused by the blooms. Further, consideration was being given to follow-up studies to determine the effects of the deaths on the size and productivity of the local bottlenose dolphin population and to determine whether the animals that survived the event may be more susceptible to morbillivirus infections or other diseases.

Working Group on Marine Mammal Unusual Mortality Events

As noted in previous Commission reports, the deaths of hundreds of bottlenose dolphins along the U.S. mid-Atlantic coast in 1987-1988 led to the Marine Mammal Health and Stranding Response Act of 1992 (Title IV of the Marine Mammal Protection Act). Among other things, the Act directed the Secretary of Commerce to (1) establish an expert working group to provide advice on measures necessary to better detect and respond appropriately to future unusual marine mammal mortality events; (2) develop a contingency plan for guiding response to such events; (3) establish a fund to compensate persons for certain costs incurred in responding to unusual mortality events; (4) develop objective criteria for determining when sick and injured marine mammals have recovered and can be returned to the wild; (5) continue development of the National Marine Mammal Tissue Bank; and (6) establish and maintain a central database for tracking and accessing data concerning marine mammal strandings.

The Secretary delegated responsibility for these activities to the National Marine Fisheries Service.

In response, the Service, in consultation with the Commission and the Fish and Wildlife Service, in 1993 established the Working Group on Marine Mammal Unusual Mortality Events. The group held its first meeting in April 1993 and has met annually since then. The National Marine Fisheries Service designated a staff person to consult with the group whenever increases in stranding rates or other factors suggest that an unusual mortality event may be occurring.

The working group has developed criteria to assist in judging when an unusual mortality event may be occurring. The criteria are (1) a marked increase in the number of strandings compared to historic records; (2) animals are stranding at a time of year when strandings are unusual; (3) an increase in strandings is occurring in a very localized area (possibly suggesting a localized problem), is occurring throughout the geographical range of a species or population, or spreads geographically with time; (4) the species, age, or sex composition of the stranded animals differs from that which occurs normally in the area or time of the year; (5) stranded animals exhibit similar or unusual pathologic findings or the general condition (*e.g.*, blubber thickness) of stranded animals differs from what is seen normally; (6) living animals in the area where mortality is occurring exhibit abnormal behavior; or (7) critically endangered species are stranding. The working group also has assisted in preparing the National Contingency Plan for Response to Unusual Marine Mammal Mortality Events, published by the National Marine Fisheries Service in September 1996 (NOAA Technical Memorandum NMFS-OPR-9) and the Contingency Plan for Catastrophic Manatee Rescue and Mortality Events, published by the Fish and Wildlife Service in 1998.

The 1999 meeting of the working group was held on 25-26 March at the National Marine Fisheries Service's headquarters in Silver Spring, Maryland. Items on the agenda included reviews of information concerning the harbor porpoise and gray whale strandings described above; reports on the unusual marine mammal mortality events that occurred in 1998 and are described in the Commission's previous report; the results of the contaminants workshop described in Chapter VII; the National Oceanic and Atmospheric Administration's research and monitoring program

regarding harmful algal blooms; and the development of criteria for determining when rehabilitated marine mammals can be returned to the wild (see below).

During the meeting, the working group noted that the National Marine Fisheries Service had been able to initiate most of the activities mandated by the Marine Mammal Health and Stranding Response Act, but that funding constraints had limited the Service's efforts to develop accurate baseline information on stranding rates, contaminants, disease, and related factors important for detecting and determining causes of unusual mortality events. By letter of 23 April 1999 the chairman of the working group advised the National Marine Fisheries Service of the efforts that have been hampered by limited funding. The letter recommended that the Service seek increases in the authorized funding levels and appropriations for the stranding program and the Marine Mammal Tissue Bank. The letter also noted that the Marine Mammal Health and Stranding Response Act had provided for establishment of an interest-bearing Marine Mammal Unusual Mortality Event Fund, but that the Service apparently had neither requested appropriations nor sought funding from private sources to create this fund. It recommended that the Service request a \$1,000,000 authorization and appropriation to initiate the fund and to task a qualified individual or organization to identify and solicit contributions to the fund from potential private sector donors.

With regard to the last point, the letter noted that the Marine Mammal Protection Act had been amended in 1994 to allow money from the Unusual Mortality Event Fund to be used for the care and maintenance of marine mammals seized by the National Marine Fisheries Service or the Fish and Wildlife Service because the facility holding them for public display or other purposes no longer was able to care for the animals or to pay for transporting and maintaining them at other facilities. While recognizing the need to ensure the welfare of such animals, the working group believed that authorizing use of the Unusual Mortality Event Fund for this purpose was contraindicated for two reasons: (1) the fund could be depleted to care for animals seized because a facility failed to meet its obligations, and thus would not be available when an unusual mortality event occurred; and (2) some potential donors may be willing to

contribute to a fund to respond to unusual mortality events, but not to a fund for care and maintenance of animals seized because a facility failed to meet its responsibilities. The working group recommended that the Service seek deletion of the provision allowing money from the fund to be used for care and maintenance of seized animals.

The Commission was sent a copy of the 23 April 1999 letter to the Service from the Chairman of the Marine Mammal Unusual Mortality Event Working Group. By letter of 17 May 1999 the Commission advised the Service that it shared the view that efforts to fully implement the mandates of the Marine Mammal Health and Stranding Response Act had been hampered by funding constraints and that the Service should seek increases in its authorization levels and appropriations for collecting, archiving, and analyzing stranding and related data and for operating the National Marine Mammal Tissue Bank and related programs. Further, the Commission recommended that the requested funding be used, in part, to add at least one qualified veterinarian or biologist and a full-time data manager to the staff of the Marine Mammal Stranding Response Coordinator in the Office of Protected Resources.

The Commission also concurred with the working group's view that use of the Marine Mammal Unusual Mortality Event Fund for care and maintenance of animals seized because the facility holding the animal was unable to provide the required care and maintenance could make some potential donors unwilling to contribute to the fund and/or deplete the fund so that it no longer can support appropriate response to unusual mortality events. However, the Commission noted that the desired end might be achieved by simply establishing separate accounts and soliciting money independently for the two purposes. The Commission also questioned whether a \$1,000,000 appropriation was necessary to initiate the fund, and pointed out that the fund was intended to be maintained at least in part, if not primarily, by contributions from the private sector. Toward this end, the Commission recommended that the Service immediately either designate an appropriate staff member or contract with a qualified individual or organization to begin identifying potential private-sector donors and soliciting contributions from them.

The Service responded to the 23 April 1999 letter from the Chairman of the Working Group on Marine Mammal Unusual Mortality Events by letter of 21 May 1999. The response indicated that the Marine Mammal Protection Act was scheduled for reauthorization in 1999 and that the Service was in the process of developing recommendations for changes to the Act. The response also indicated that the Administration's FY 2000 budget submission included \$125,000 annually for the next five years for the Marine Mammal Unusual Mortality Event Fund. It also indicated that \$160,000 had been requested for the stranding database and information management.

Subsequently, the working group learned that the National Marine Fisheries Service staff member who had served as the group's executive secretary and primary liaison with the Service since 1993 would no longer be able to do so. By letter of 23 July 1999 the chairman of the working group conveyed the group's concerns that effective consultations could be affected if an appropriately qualified replacement were not appointed. The letter pointed out that a veterinarian on the Service's staff was the logical person to fill the post, but that she currently was carrying the responsibilities previously handled by three people. The working group recommended that the veterinarian be assigned to serve as executive secretary to the working group and that she be given a staff to enable her to meet both this responsibility and her other duties.

The Service responded on 14 October 1999 to the Commission's letter of 17 May 1999. The letter indicated that the Service was developing recommendations for changes to the Marine Mammal Protection Act; that the Service had requested additional funding in its FY 2000 budget request for the Marine Mammal Health and Stranding Response Program; that the request had included \$125,000 for the Unusual Marine Mammal Mortality Event Fund, \$160,000 for database and information management, and \$300,000 for contaminant monitoring and effects research; that Congress seemed unlikely to provide the requested funding; that the Service planned to hire a national stranding coordinator in the near future, but would be unable to add a full-time database manager; and that, because of the budget constraints, the Service would be unable to dedicate a staff member or contract a

professional fund-raiser to seek private contributions to the Unusual Mortality Event Fund.

On 18 October 1999 the Service responded to the letter of 23 July 1999 from the Chairman of the Working Group on Marine Mammal Unusual Mortality Events. In the letter, the Service advised the working group that the financial resources of the Office of Protected Resources were limited and that it would be difficult to find a replacement for the individual who had served as the executive secretary for the working group. The letter indicated that the Office of Protected Resources would be advertising for a national stranding coordinator in the near future and that the veterinarian referenced in the Chairman's letter of 23 July would serve as the executive secretary temporarily until such time as another permanent staff member is available to assume that role.

At the end of 1999 the Service had not yet designated a national stranding coordinator or an executive secretary for the working group. Further, the Service had not conveyed to either the Commission or the working group its recommendations for amending Title IV of the Marine Mammal Protection Act concerning the Marine Mammal Health and Stranding Response Program.

Development of Release Criteria

As noted earlier, the Marine Mammal Health and Stranding Response Program Act directs the Secretary of Commerce to develop objective criteria for use in determining when live-stranded animals have been rehabilitated to the point that they can be released to the wild without jeopardizing either their health and survival or the welfare of other animals. As noted in previous Commission reports, possible criteria were discussed during the meetings of the Working Group on Marine Mammal Unusual Mortality Events in 1994, 1995, 1996, and 1997. A draft paper setting forth possible release standards was provided to the working group for review and comment in May 1996. The document was expected to be completed in 1999. However, because of the funding and personnel constraints noted earlier, nothing was done in 1999 to complete formulation of release standards.

Chapter VII

EFFECTS OF POLLUTION ON MARINE MAMMALS

Marine mammals can be affected directly and indirectly by a variety of environmental contaminants of human origin. These include persistent organic compounds and toxic metals from point and non-point sources, lost and discarded fishing gear and other marine debris, and noise from a variety of anthropogenic sources. Direct effects include but are not limited to mortality from toxic chemical spills, entanglement in lost and discarded fishing gear, disorientation, and hearing loss or masking of communication sounds by sounds from human sources. Indirect effects include decreased survival and productivity due to contaminant-caused decreases in essential prey.

Actions taken by the Commission and others with regard to marine debris are described in the Commission's previous reports and in the sections of this report concerning Hawaiian monk seals (Chapter III) and conservation of marine mammals and their habitats in the Southern Ocean (Chapter V). The following sections of this chapter provide background information and describe efforts by the Commission, in consultation with its Committee of Scientific Advisors, to identify and precipitate actions necessary to minimize threats posed by chemical pollution and noise from various sources.

Effects of Chemical Contaminants

Virtually all marine mammals alive today have been exposed to a variety of chemical compounds and trace elements introduced into the marine environment by human activities. Many of these substances enter the marine environment directly as a result of runoff, dumping, and atmospheric transport. They are also dispersed in the environment via food webs. As high-order predators, marine mammals (except the sireni-ans and some baleen whales) can be exposed to high levels of some contaminants as a result of biomagnification. Like other air-breathers, marine mammals

also are exposed to contaminants via atmospheric gas exchange. Studies have confirmed high body burdens of some contaminants in marine mammals, but the physiological processes involved in storage, metabolism, and elimination of contaminant burdens are poorly understood. Also, there is great uncertainty about the mechanisms and pathways of contaminant flux in marine environments and food webs. Thus, it is difficult to verify that high body burdens of contaminants have directly impaired the health and well-being of individuals or populations.

Workshop on Marine Mammals and Persistent Ocean Contaminants

Concern regarding possible effects of chemical contaminants on the health of individual marine mammals and on the welfare of marine mammal populations has received increasing attention over the past three decades, and especially during the last few years. The reasons for the concern include (1) the apparently increasing incidence of disease outbreaks involving many animals with apparently high burdens of organochlorines or other contaminants, and (2) the growing experimental and other evidence that contaminants often found in marine mammal tissues have deleterious effects on reproduction in laboratory animals. Recognizing the growing significance of the problem, the Marine Mammal Commission, the Biological Resources Division of the U.S. Geological Survey, the National Marine Fisheries Service, the Environmental Protection Agency, and the National Fish and Wildlife Foundation jointly sponsored a Workshop on Marine Mammals and Persistent Ocean Contaminants in October 1998.

The workshop, held in Keystone, Colorado, was attended by more than 50 scientists from seven countries. Their expertise spanned the disciplines of environmental toxicology, environmental chemistry, marine mammal health and husbandry, pathology and

disease, physiology, immunotoxicology, marine mammal population dynamics and ecology, experimental design, and environmental risk assessment. A final workshop report was published in April 1999. The report includes a summary of priority uncertainties, a list of 20 principal conclusions and recommendations drawn from the working group reports, extended abstracts of the plenary presentations, and a series of appendices.

The report concluded that there is good reason to be concerned that the survival and reproduction of certain marine mammals may have been affected, and are being affected, by persistent contaminants, particularly organochlorines. Concern was also expressed about the effects of eutrophication of coastal waters by excessive inputs of nitrogen and phosphorus, which could diminish the capacity of coastal fish and invertebrate communities to support marine mammal populations and which might lead to more frequent and larger toxic algal blooms, occurrences that are known to kill marine mammals. The participants noted that there remains great uncertainty about specific effects of contaminants on marine mammals, the extent to which such effects may occur in marine mammals in the wild, and what impacts such effects are having on marine mammal population dynamics.

Areas of uncertainty identified at the workshop and noted in the report include (1) pathologic effects of persistent ocean contaminants on marine mammals, (2) relationships between exposure to environmental contaminants and immunotoxicity, (3) the role of environmental contaminants in marine mammal reproductive dysfunction, (4) potential impacts of endocrine-disrupting contaminants on marine mammals, (5) predicting the risk to individual marine mammals and to marine mammal populations associated with exposure to persistent contaminants, (6) future trends of currently known contaminants, and (7) future trends of new or less widely studied contaminants. The workshop concluded that closing these knowledge gaps will make science better able to guide those making policy, management, and regulatory decisions related to the impacts of contaminants.

Participants in the workshop emphasized the need for multidisciplinary studies that integrate physiological, behavioral, reproductive, clinical, pathologic, and

toxicological data to evaluate the relationships of immune status, health, reproduction, and survival of individuals to population-level and ecosystem-level trends. Participants recommended that such studies should be conducted on both wild and captive populations. Participants also pointed out the value of long-term research and monitoring programs and the importance of providing a stable funding base. Also, it was noted that *in vitro* studies using marine mammal cell lines or experimentation with laboratory animals will be necessary to understand the subcellular mechanisms by which contaminants affect marine mammals. Invasive experiments can use laboratory animals as surrogates for marine mammals, with acknowledgment that responses would vary among species. In this regard, establishment of dose-response relationships and response thresholds may require experiments with captive marine mammals.

Because most marine mammals are exposed to multiple contaminants in nature, experiments on cell lines, surrogate species, or captive marine mammals should ultimately include exposures to complex mixtures in addition to single chemicals. Biomarkers need to be developed and validated for marine mammals. Finally, participants emphasized potential future problems with well-known contaminants, substances not yet identified or monitored by current analyses, and new products under development.

Workshop Follow-Up

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the findings in the workshop report. It was evident that many federal and state agencies and international and academic institutions are conducting or supporting related research and that much of the research is focused on documenting the types and levels of contaminants present in marine species in different parts of the world. However, little is known about the effects of various contaminants and combinations of contaminants on growth, reproduction, or survival of any marine mammal species, and there is no mechanism in place to coordinate research and monitoring being conducted or supported by different entities. This makes it difficult to avoid duplication and to focus on the subjects of greatest practical importance. Therefore, the Commission recommended on 16 July 1999

to the Under Secretary of Commerce for Oceans and Atmosphere that the National Oceanic and Atmospheric Administration constitute an interagency working group to agree on priorities for contaminants research, review ongoing domestic and international research programs to improve coordination and content, and develop proposals for cooperative domestic budget initiatives to meet priority needs more effectively. The Commission noted that the interagency working group might include representatives of the National Marine Fisheries Service, the National Ocean Service, the Environmental Protection Agency, the Fish and Wildlife Service, the Biological Resources Division of the U.S. Geological Survey, the Minerals Management Service, the National Science Foundation, and the Marine Mammal Commission.

The Under Secretary responded on 1 November 1999, noting that the workshop proceedings were extremely informative, particularly in identifying actions needed to determine the potential impacts of persistent organic pollutants on marine mammals. The Under Secretary also stated that the Commission's recommendation to form an interagency working group was an excellent one and that National Oceanic and Atmospheric Administration staff was pursuing establishing such a group. The Commission responded to the Service's letter on 23 November 1999 agreeing to the utility of the workshop proceedings and noting that, had it not been for the support of the National Marine Fisheries Service, it would not have been able to hold the workshop. The Commission also reiterated the view that the National Oceanic and Atmospheric Administration should move forward with establishing the interagency working group.

Contaminants and California Sea Otters

As noted in the section on California sea otters in Chapter III, the California sea otter population appears to have been declining since 1995. The cause of the decline is not known but could include direct toxic effects of contaminants and increased susceptibility to disease as a result of immune suppression associated with contaminants. These possibilities were noted during the Commission's annual meeting on 19-21 October 1999. In response to issues brought up at the meeting, the Commission developed a draft action plan, which was provided to the Fish and Wildlife

Service on 23 December 1999. The Commission noted in the draft action plan that postmortem examination and analysis of samples collected from beach-cast sea otter carcasses have documented the presence of potentially harmful levels of DDT derivatives, butyltin, and other anthropogenic contaminants that may be adversely affecting the California sea otter population. The Commission therefore recommended that the Service coordinate the efforts of relevant state and federal agencies to better determine threats to sea otters posed by diseases and environmental contaminants. Specifically, the Commission recommended that results of studies done to date should be evaluated to identify and determine what can and should be done to answer critical questions concerning the presence and effects of disease and contaminants on the population. Further, the Commission noted that fishermen should be encouraged to keep any sea otters caught and killed during fishing operations and turn them over to experts to determine whether the incidences of disease and contaminants in those animals are comparable with those found in beach-cast animals. Further, the Commission recommended evaluating and, if necessary, augmenting existing research and monitoring programs to determine whether they are adequate to detect and eliminate sources of contaminants that may be posing threats to sea otters.

Contaminants in the Arctic

Pollutant levels in Arctic marine mammal species may be affecting both the animals and the Alaska Natives who rely on them for subsistence purposes. The Working Group of the Arctic Monitoring and Assessment Program under the Arctic Council is charged with reporting on levels, effects, and sources of environmental pollutants in the Arctic (see Chapter V). The working group has been instructed by the Arctic Council to produce assessments on a variety of subjects including current topics such as the anti-fouling paint additive tributyltin.

Effects of Noise

The behavior and, in some cases, the survival and productivity of marine mammals may be affected by human sources of sound in the world's oceans. How

and to what extent such sounds affect marine mammals depend on a number of variables. The variables include the nature and intensity (loudness) of the sounds, whether the source is stationary or moving, and the species, age, sex, reproductive status, activity, and previous experience of the animals exposed to the sound. Response may also vary depending on the environment. For example, animals may respond differently to the same sounds if they are in deep vs. shallow water, in murky vs. clear water, and in embayments vs. the open ocean.

The sources and pervasiveness of anthropogenic sound in the world's oceans have increased substantially since the Marine Mammal Protection Act was passed in 1972. For example, as noted below and in previous annual reports, sound is being used to locate and map offshore oil and gas deposits, to detect climate-related changes in ocean temperature, to detect and track the movements of submarines, and to minimize the risks of certain marine mammals being caught and killed in fishing gear. Also, the number, size, and speed of both recreational boats and commercial ships have increased.

Available information often is insufficient to identify and make reasoned judgments regarding the relative costs and benefits of human activities that use and produce sounds and that could affect marine mammals and other marine species. The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviews sound-producing activities that may adversely affect marine mammals and provides recommendations to the responsible regulatory agencies on measures needed to resolve uncertainties and to ensure that the activities do not have significant adverse effects on marine mammals or critical components of their habitats. The Commission's recommendations with regard to requests for small-take authorizations and assessment of the possible effects of seismic surveys and other activities associated with offshore oil and gas exploration and development are described in Chapters VIII and X. Background information and Commission actions in 1999 regarding other sound-producing activities that could affect marine mammals are described below.

Acoustic Thermometry of Ocean Climate Program

In 1993 the Defense Department's Advanced Research Projects Agency provided funds to the Scripps Institution of Oceanography for a study to determine if low-frequency sounds could be transmitted across ocean basins and used to detect changes in ocean temperature possibly indicative of global climate change. The study, entitled the Acoustic Thermometry of Ocean Climate (ATOC) Program, ultimately involved installing and periodically operating high-energy, low-frequency sound generators in deep-water areas off the northern coast of Kauai, Hawaii, and on the Pioneer Seamount offshore of California.

Available information was insufficient to determine how ATOC sound transmissions might affect marine mammals. Consequently, the program was expanded to include a marine mammal research component, and an advisory board of scientists not associated with the program was established to provide advice on study design. In addition, the Advanced Research Projects Agency and the National Marine Fisheries Service jointly prepared environmental impact statements regarding operation of both sound sources, and the ATOC principal investigator applied for and received permits from the National Marine Fisheries Service authorizing the taking of marine mammals in the course of the planned marine mammal studies. The Marine Mammal Commission's comments and recommendations regarding the environmental impact statements and the scientific research permits are described in previous annual reports. The Advanced Research Projects Agency also requested that the National Research Council constitute a committee to evaluate the results of the ATOC Marine Mammal Research Program.

This proof-of-concept study was completed in 1999. The results indicate that (1) low-frequency sound transmissions can provide a useful tool for detecting and measuring variability and trends in ocean temperature, and (2) although some changes in the distribution and behavior of marine mammals were documented in the vicinity of the two sound sources, the changes likely were negligible.

Meetings of the National Research Council's committee and the Marine Mammal Research Program Advisory Board were held in April and June 1999, respectively, to evaluate the study results. At that time, the fine-scale analysis of the research results had not yet been completed. By the end of the year, neither the National Research Council's committee nor the research program advisory board had completed analyses of the research results.

At the end of the year, it was the Commission's understanding that the participating oceanographers (1) were seeking funding to continue operation of the Kauai source for a minimum of five more years, and (2) were consulting with the National Marine Fisheries Service to determine whether it will be necessary and possible to obtain authorization under section 101(a)(5)(A) of the Marine Mammal Protection Act to take marine mammals incidental to operation of the Kauai source.

Operational Deployment of the Navy's Low-Frequency Active Sonar

In July 1996 the Department of the Navy published a *Federal Register* notice announcing its intent to prepare environmental impact statements on operational deployment of a surveillance towed array sensor system (SURTASS) low-frequency active (LFA) sonar. The notice indicated that the system used propagated low-frequency sound (<1,000 Hz) to detect objects on and under the surface of the sea and that the Navy proposed to make the system available to fleet commanders to enhance antisubmarine capability. The notice requested information and views on issues that should be addressed in the environmental impact statements.

The Commission's responses to the notice and subsequent efforts by the Navy to obtain information necessary to assess the possible environmental impacts of the proposed action are described in previous annual reports. In July 1999 the Navy made available for public review and comment its "Draft Overseas Environmental Impact Statement and Environmental Impact Statement for [the] Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) Sonar." The Marine Mammal Commission, in

consultation with its Committee of Scientific Advisors, reviewed the draft and forwarded comments and recommendations to the Navy on 27 October 1999.

The Commission noted that, although the conclusion that the proposed action would have negligible effects on marine mammals was based on the best available information, the information is insufficient to predict accurately any likely cause-effect relationships. Consequently, the conclusions are necessarily based on a number of assumptions and would be valid only to the extent that the assumptions are valid. The Commission recommended that (1) the Navy, if it had not already done so, consult with the National Marine Fisheries Service to determine the monitoring that would be required to confirm the validity of the key assumptions on which the "negligible effects" conclusion was based, and (2) the final environmental impact statement describe both the assumptions and the monitoring that will be done to confirm the validity of those assumptions. The Commission also recommended that the final environmental impact statement be expanded to (a) describe the data and analyses used to conclude that exposure levels greater than 145 dB could be hazardous to human divers, and (b) explain why exposure levels up to 180 dB were not expected to be hazardous to marine mammals. Further, the Commission recommended that the environmental impact statement be revised to more clearly and appropriately reflect the Marine Mammal Protection Act's definitions of level A and level B harassment.

In August 1999 the Navy submitted to the National Marine Fisheries Service a request for a letter of authorization pursuant to section 101(a)(5)(A) of the Marine Mammal Protection Act to take small numbers of marine mammals incidental to operational use of the SURTASS LFA sonar. On 22 October 1999 the National Marine Fisheries Service published notice of this request and an advance notice of proposed rule-making in the *Federal Register*. At the end of the year, it was the Commission's understanding that the Navy would publish a final environmental impact statement early in 2000 and that the National Marine Fisheries Service subsequently would publish proposed regulations to authorize the possible taking of marine mammals incidental to operational use of the sonar. Further, the Commission understands that the Navy and the National Marine Fisheries Service are

consulting to determine the monitoring that would be required to confirm that operational use of the sonar does in fact have negligible impacts on marine mammals.

Acoustic Deterrence of Harmful Marine Mammal-Fishery Interactions

Many species of marine mammals interact with commercial fisheries and aquaculture operations in ways that result in the death and injury of marine mammals and cause the loss of fish and damage to fishing gear and aquaculture facilities. Because many marine mammals use sound to communicate, navigate, and capture prey, both the fishing industry and the scientific community have experimented with a variety of sound reflectors and sound generators to try to prevent or reduce harmful interactions.

The National Marine Fisheries Service provided funds to the Commission in October 1995 for a workshop to identify critical uncertainties concerning the effects and effectiveness of acoustic devices used to prevent or reduce interactions. The results of that workshop, held in Seattle, Washington, on 20-22 March 1996, are described in previous annual reports (see Appendix C, Reeves *et al.* 1996).

In July 1997 the National Marine Fisheries Service provided funds to the Pacific States Marine Fisheries Commission to modify and determine whether pulsed-power devices used to clear blockages in oil wells might be used to stop California sea lions from preying on fish caught by recreational fishermen on commercial passenger fishing vessels. The device used by the oil industry was modified so that it could be used on such vessels. Subsequent tests indicated that the output from the modified device possibly could prevent sea lions from approaching areas where fish are being caught and that field tests should be conducted to evaluate the efficacy of the device and its possible effects on angler catch rates. Recognizing that testing of the device could have significant environmental impacts, the National Marine Fisheries Service's regional office in California prepared a draft environmental assessment in accordance with the National Environmental Policy Act. The draft assessment indicated that the impulses and sounds produced

by the generator could cause temporary or permanent hearing damage, or otherwise harm marine mammals, at distances of 100 meters or more. It concluded that field testing of a single device, using specified safety zones for pinnipeds and cetaceans, would have no significant environmental impacts.

The draft assessment was provided to the Commission for comment in January 1999. In its comments provided to the Service by letter of 23 February 1999 the Commission noted that, if the proposed testing could adversely affect both target and non-target species, as seemed possible, it followed that (1) the testing should be done under a scientific research permit issued by the Service after opportunity for public review and comment; (2) the study should be designed to document the possible effects of operation of the device on both target and non-target species, as well as to determine its efficacy in keeping seals and sea lions away from commercial passenger fishing vessels; and (3) if there are significant uncertainties concerning the possible environmental impacts of the proposed testing, as seemed to be the case, an environmental impact statement should be prepared. The Commission also suggested that the impact assessment should consider two additional alternatives: (1) using the pulsed-power device only periodically to establish and maintain a conditioned avoidance response to the generated sounds, and (2) removing animals that have learned to prey on caught fish using both lethal and non-lethal means.

On 5 October 1999 the National Marine Fisheries Service forwarded a revision of the draft environmental assessment to the California Coastal Commission with a request that the Coastal Commission concur with the Service's determination that the proposed field test was consistent to the maximum extent practicable with the California Coastal Management Program. During the meeting of the Marine Mammal Commission and its Committee of Scientific Advisors in Seaside, California, on 19-21 October 1999, representatives of the Service and the California Department of Fish and Game briefed the Commission on the Service's contract with the Pacific States Marine Fisheries Commission and the rationale for the finding of no significant impact in the draft environmental assessment forwarded to the California Coastal Commission for the consistency determination re-

quired by the Coastal Zone Management Act. The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, subsequently reviewed and by letter of 23 November 1999 provided comments to the Service on the draft assessment.

The Commission noted that it shared the views of the National Marine Fisheries Service and the California Department of Fish and Game that research is needed to determine whether there are practical, non-lethal means for preventing or reducing sea lion predation on caught fish and that the pulsed-power device described in the draft environmental assessment could be useful in this regard and merited evaluation. However, the Commission questioned whether the draft environmental assessment adequately evaluated the possible environmental impacts of the proposed field test. The Commission also questioned whether the full range of possible alternative actions had been identified and whether what was identified as the preferred alternative was in fact the best of the possible alternatives. The Commission recommended that, before field testing the pulsed-power device, studies be done to determine whether the device could be used to develop and maintain a conditioned avoidance response to a less-damaging signal. The Commission also recommended that the Service, if it had not already done so, make arrangements to have experienced sea lion trainers observe representative fishing operations to identify human behavior that may be contributing to sea lion predation on caught fish and to suggest steps that might be taken to prevent development of, or to extinguish, learned sea lion behavior contributing to the problem. Further, the Commission recommended that, if there are significant uncertainties as to whether sea lions can be detected before they get near enough to the device to be injured, studies should be done with captive animals before conducting any field trials to verify that exposure to compression waves and sound levels up to 205 dB will not cause hearing damage or other serious injury.

The California Coastal Commission subsequently determined that the information presented in the draft environmental assessment was insufficient to ensure that the proposed field test would not harm sea lions or comply to the maximum extent practicable with the California Coastal Management Program. Further,

the Coastal Commission advised the Service that additional information was needed to make the consistency determination, including evidence from an appropriately designed study demonstrating that the device would not adversely affect the behavior or physiology of California sea lions, and evidence that the pulsed-power device will not interfere with recreational fishing.

At the end of the year the Service was considering the alternatives suggested by the Coastal Commission.

Workshop on the Effects of Anthropogenic Noise in the Marine Environment

As noted in the previous annual report, the Office of Naval Research held a workshop on 10-12 February 1998 to identify critical research needs regarding the effects of anthropogenic noise on marine mammals and other marine organisms, including fish and sea turtles. The report of the workshop was published in 1999 by the Office of Naval Research. The report provides thorough overviews and assessments of available information concerning the sources and transmission of sound in the marine environment; the effects of anthropogenic sounds on the hearing of marine mammals; the physiological and behavioral effects of sound on human divers, marine mammals, sea turtles, and fish; and issues related to the monitoring and mitigation of the effects of anthropogenic noise on marine mammals and other marine organisms. Copies of the report can be obtained from the Marine Mammal Program Manager, Office of Naval Research, 800 North Quincy Street, Arlington, Virginia 22217-5660. The report also can be obtained from the Office of Naval Research's website at www.onr.navy.mil/sci_tech/engineering/onrtxaff.htm.

Gulf of Mexico Marine Protected Species Workshop

The Minerals Management Service has funded a broad range of studies to determine the possible effects of offshore oil and gas exploration and development on marine mammals and other components of the outer continental shelf marine ecosystem (see, for example, Appendix B, Waring 1981-1999). One such study was an assessment of the species, numbers, and

environmental factors affecting the distribution of cetaceans in the northern Gulf of Mexico where offshore oil and gas exploration and development occurs. This program, known as the GulfCet Program, was funded by the Minerals Management Service in response to information needs identified by participants in a Service-sponsored workshop on sea turtles and marine mammals in the Gulf of Mexico held in August 1989.

On 15-17 June 1999 the Minerals Management Service held a Gulf of Mexico Marine Protected Species Workshop in New Orleans. One of the purposes of the workshop was to review the results of the GulfCet Program and other studies done since the 1989 workshop. Participants included representatives of the Commission, the Minerals Management Service, the National Marine Fisheries Service, the National Ocean Service, the Biological Resources Division of the U.S. Geological Survey, the Army Corps of Engineers, the Office of Naval Research, the oil and gas industry, the environmental community, and several academic institutions.

With regard to marine mammals, the participants noted that oil and gas exploration and development have been ongoing in the northern Gulf for nearly 50 years and that marine mammals have been exposed regularly during this period to noise from seismic surveys, drilling, supply boat, helicopter, and other operations, and may have become accustomed to the noise. They also noted that some species may have altered their distribution to avoid certain noises or noisy areas and that, as development moves into deeper offshore waters, species and individuals that have not been exposed regularly to exploration and development-related noises will be exposed to and may be affected adversely by those noises. With regard to the last point, they noted that the GulfCet studies had documented that marine mammals throughout the northern Gulf likely are exposed frequently to noise from seismic surveys and provided circumstantial evidence that sperm whales may alter vocalization and movement patterns in response to impulse sounds used for detecting and delineating oil and gas resources. Among other things, they concluded that studies should be designed and conducted to (1) assess the possibility that marine mammals in areas where exploration and development have been

ongoing for decades have become accustomed to the activities or altered their distribution or behavior to avoid areas where the activities are occurring; (2) test the hypothesis that sperm whales alter vocalization and movement patterns in response to sounds associated with seismic surveys; and (3) determine what and how additional species may be affected as exploration and development move into deeper offshore waters.

By the end of the year, the workshop report had not been finalized for public distribution. However, based on the workshop findings, the Minerals Management Service has proposed studies for FY 2000 to measure ambient noise levels and test field methods for better assessing sperm whale responses to development-related sound sources. A more detailed description of this workshop is provided in Chapter VIII.

Workshop on the Possible Use of Active Acoustics to Reduce Right Whale Mortalities and Injuries from Ship Strikes

As noted in the previous annual report, the Navy provided support for research during the winter of 1996-1997 to determine if passive acoustic (listening) technology could detect and help Navy ships avoid right whales in the species' calving grounds off Florida and Georgia. The study found that whales could be located and tracked when they were vocalizing, but that they vocalized too infrequently to make the approach useful.

By letter of 20 July 1997 the Commission asked the Navy to consider additional testing to determine whether placement of networks of active sonar buoys along ship channels could be used to detect and enable ships to avoid whales in the channels. Navy representatives subsequently advised the Commission that they were willing to consider such research but were concerned that much time and money could be spent on research with no useful outcome and believed that, before proceeding, criteria should be developed to assist in identifying research that would have practicable application and no unacceptable side effects.

The Commission shared the Navy's concern and by letter of 12 November 1997 suggested that the Navy consult with relevant experts to determine minimum

performance standards that would have to be met for a sonar system to be judged practical and effective for reducing right whale mortalities and injuries caused by ship strikes. Further, the Commission expressed the view that, to be judged cost-effective, a system would have to be capable of detecting whales (1) when they are at or near the surface, particularly in shallow coastal waters; (2) at distances that would allow the ships adequate time to alter course or speed to avoid whales that are detected; (3) under the range of environmental conditions in which whales are likely to be present; (4) without adversely affecting the whales, other biota, or other uses of the sea; and (5) at a cost that would be considered reasonable.

As noted in the Commission's previous report, the Navy planned to hold a workshop in Jacksonville, Florida, on 8-9 October 1998 to obtain expert advice on criteria that could be used to solicit and evaluate research proposals. Those invited included private-sector scientists and engineers with relevant expertise. The possibility that some of those invited had related research interests raised concerns that their participation in the workshop could make them ineligible to respond to requests for proposals or to receive Navy funding of unsolicited research proposals related to the workshop findings. To avoid any such possibility, the workshop was cancelled.

Subsequently it was agreed that, rather than having a large workshop involving possible private-sector research interests, it would be preferable to have a small workshop, involving only agency experts, to determine the basic operational, environmental, and economic considerations that would have to be met for active sonar systems to be judged potentially feasible for reducing right whale mortalities and injuries from ship strikes. The workshop was held at the headquarters of the National Marine Fisheries Service in Silver Spring, Maryland, on 28 July 1999. Participants included representatives of the Commission, the National Marine Fisheries Service, the Navy, the Coast Guard, and the Minerals Management Service.

The workshop report was drafted by the Commission staff and is available from the Commission. It concludes that (1) at present there is no reason to believe that a hull-mounted active sonar could provide a safe and economically feasible means for preventing

or significantly reducing right whale mortalities and injuries from ship strikes; (2) although technically feasible, fixed sonar arrays appear unlikely to provide a practical means for preventing or reducing ship strikes, even in restricted areas such as shipping channels; and (3) projecting low-level, non-aversive sounds in front of ships transiting areas where right whales are likely to be encountered might reduce the risk of ship strikes and merits further investigation. With regard to the first point, the workshop participants noted that a number of active sonars could be useful as research tools. With regard to the second point, the participants suggested that an analytical study be done to validate the tentative conclusion that fixed sonar arrays are unlikely to provide a practical solution to the problem. With regard to the third point, the participants noted that priority should be given to determining the types and levels of ship noises likely to reach right whales at or above keel depths as they are approached by various classes of ships, traveling at different speeds in different environmental conditions, and how the whales respond to the different types and levels of noises.

Additional information concerning this workshop is provided in the right whale section of Chapter III.

Shock Testing the U.S.S. *Winston S. Churchill*

The National Defense Authorization Act requires that new designs for hulls and other critical components of Navy ships and submarines undergo shock tests before service in the fleet. The purpose of the tests is to evaluate the reliability of structural and electronic systems vital to the performance of the vessels and crews under combat conditions.

In December 1999 the Navy issued for public review and comment a draft environmental impact statement for the shock trials of the *Winston S. Churchill* (DDG 81). The Commission has requested copies of the draft statement and anticipates providing comments to the Navy early in 2000.

Chapter VIII

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 habitats. Under the Outer Continental Shelf Lands Act, the Department of the Interior's Minerals Management Service is responsible for assessing, detecting, and preventing or 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 on measures needed to ensure that those activities will not have adverse effects on marine mammals or endangered or threatened species.

The Marine Mammal 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 1999 are described below.

Section 101(a)(5) of the Marine Mammal Protection Act directs the Secretaries of Commerce and the Interior to authorize the taking of small numbers of marine mammals incidental to activities, such as offshore oil and gas exploration and development, when the taking will have negligible effects on the distribution, size, and productivity of the affected species or populations and will be no unmitigable adverse impacts on the availability of the affected species or populations for taking by Alaska Natives for subsistence purposes. In 1999 the Commission reviewed and provided comments and recommendations to the National Marine Fisheries Service and the Fish and Wildlife Service on several requests for incidental-take authorizations. These requests and

related actions by the Commission and the regulatory agencies are described in Chapter X.

Destin Dome Development and Production Plan

In August 1999 the Minerals Management Service's Gulf of Mexico Region distributed a draft environmental impact statement on the Destin Dome 56 Unit Development and Production Plan and Right-of-Way Pipeline Application. The project involves the proposed drilling of up to 20 gas wells and construction of an associated pipeline to carry gas from previously leased offshore tracts in the Gulf of Mexico about 25 miles south of Pensacola, Florida.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the draft statement and by letter of 15 October 1999 provided comments to the Minerals Management Service. The Commission noted that the draft statement provided a reasonably thorough and objective overview of the possible direct and indirect effects of the proposed action on marine mammals. It also noted that, because the proposed development involves natural gas only, there is little likelihood of potential problems associated with offshore oil production, such as catastrophic oil spills. In the Commission's opinion, however, there were a number of areas in which the statement should be clarified to better assess and identify measures to prevent possible impacts on marine mammals and their habitats.

The Commission noted, among other things, that, although manatees may be relatively uncommon in the proposed development area, manatee sightings in the area have increased in recent years. Considering the endangered status of the species, even a single manatee death associated with the proposed action could

exacerbate an already serious situation. Therefore, the Commission suggested that in the final environmental impact statement the Minerals Management Service describe actions it will undertake to ensure the safety of manatees that may be encountered in or near areas associated with development-related vessel traffic, and what will be done if one or more manatees are hit and killed or injured by boats or barges. The Commission recommended that, if it had not already done so, the Service consult with the Fish and Wildlife Service to determine the appropriate response if manatees are sighted, injured, or killed.

In its draft statement, the Service noted that the Destin Dome project calls for burying up to 90 percent of the proposed pipeline, which would result in an estimated 1 to 1.5 million cubic meters of sediments being resuspended in the water column. In its letter, the Commission noted that these resuspended sediments have the potential for releasing various contaminants, including spores of *Gymnodinium breve*, the dinoflagellate responsible for red tides. Toxins associated with red tides have been implicated in mortalities of many marine species in the Gulf of Mexico, including manatees and dolphins (see Chapter VI). The Commission therefore recommended that the Minerals Management Service contact the National Marine Fisheries Service and the Florida Department of Environmental Protection for information on factors believed to be responsible for red tides and steps that should be taken to assess and minimize possible risks associated with the proposed action. To assist the Minerals Management Service in strengthening sections of the environmental impact statement that address the possible effects of contaminants, the Commission forwarded a copy of the report from the October 1998 Workshop on Marine Mammals and Persistent Ocean Contaminants (see Chapter VII).

The Commission further suggested that the final statement clearly identify and describe what will be done to resolve or validate the uncertainties and the assumptions on which the Service based its conclusion that the proposed action will not have a significant impact on marine mammals.

Gulf of Mexico Marine Protected Species Workshop

As noted above, the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, routinely reviews and provides comments to the Minerals Management Service on draft environmental impact statements concerning proposed oil and gas lease sales on the U.S. outer continental shelf. When the leasing program began, available information often was insufficient to determine how exploration and development activities would affect marine mammals, either directly or indirectly through effects on food webs and ecosystems of which marine mammals are a part. The Commission has pointed out the uncertainties and has advised the Minerals Management Service of the range of research and monitoring programs needed to resolve them. The Service in turn has contracted for, or supported, a broad range of studies, the results of which have led to better understanding both of the possible direct and indirect effects of exploration and development activities on marine mammals and of measures that can be taken to avoid or minimize adverse effects.

As noted in previous annual reports, the Minerals Management Service held a workshop in New Orleans on 1-3 August 1989 to identify critical uncertainties concerning the possible effects of oil and gas exploration and development on marine mammals and sea turtles in the Gulf of Mexico and the research or monitoring programs required to resolve those uncertainties. Among other things, the workshop participants concluded that the basic biology, ecology, and demography of most marine mammal species inhabiting the Gulf of Mexico are either unknown or poorly known. Following the workshop, the Service provided funding to the National Marine Fisheries Service and Texas A&M University to conduct surveys and associated oceanographic studies to determine the seasonal distribution patterns and abundance of cetacean species that inhabit the northern Gulf and the environmental factors likely responsible for the observed distribution patterns. This program, known as the GulfCet Program, was completed in 1998.

The Minerals Management Service held a meeting in New Orleans on 8-10 December 1998 to review information on oil and gas exploration and development in the northern Gulf and its socioeconomic and environmental impacts. Information presented during the meeting indicated that the GulfCet Program had documented that there are both high species diversity and large numbers of marine mammals in the northern Gulf, particularly in offshore pelagic areas, and that the distribution of most species, including the endangered sperm whale, appears to be associated with cold water rings that produce upwellings and have high primary and secondary productivity. Recognizing that further studies may be needed to better predict and determine how best to avoid or minimize the effects of exploration and development activities on both marine mammals and sea turtles in the northern Gulf, the Minerals Management Service convened a workshop to solicit expert advice on information and research needs.

The workshop was held 15-17 June 1999 in New Orleans. Participants included representatives of the Marine Mammal Commission, the Minerals Management Service, the National Marine Fisheries Service, the National Ocean Service, the Biological Resources Division of the U.S. Geological Survey, the Army Corps of Engineers, the Office of Naval Research, the oil and gas industry, the environmental community, and several academic institutions. With regard to marine mammals, the following five points were noted.

(1) Studies done in Alaska and elsewhere indicate that the sounds produced by air guns used for geophysical seismic profiling and the noise associated with drilling, boat, ship, and aircraft operations can affect the distribution and biologically important behavior of many marine mammal species.

(2) Data collected during the GulfCet studies documented the seasonal distribution and abundance of the cetacean fauna that may have been or could be affected by exploration and development activities in the areas surveyed (mostly inside the 100-fathom depth contour). GulfCet data also identified environmental variables correlated with, and possibly responsible for, species-specific and seasonal variation in distribution patterns. They also documented that marine

mammals throughout the northern Gulf apparently are exposed frequently to sounds from air gun operations, and suggested that sperm whales may alter calling or movement patterns in response to those sounds.

(3) Oil and gas exploration and development have been ongoing in the northern Gulf for nearly 50 years. It is possible that coastal species of marine mammals exposed regularly to noise from seismic surveys, drilling, supply boats, helicopters, and other sources, have become accustomed to and are not affected by the noise. It is also possible that some species have altered their distribution or behavior to avoid certain noises or noisy areas and that, as development moves into deeper offshore waters, species and individuals that have not been exposed regularly to exploration and development-related noises will respond negatively and be harmed by those noises. Consequently, studies should be designed and conducted to (a) determine, to the extent practicable, whether marine mammals in areas where exploration and development have been ongoing for decades have become accustomed to the activities or altered their distribution or behavior to avoid areas where the activities are occurring; (b) test the hypotheses that sperm whales alter their vocalization and movement patterns in response to sounds associated with seismic surveys and that responses are insignificant (*i.e.*, negligible) with regard to survival and productivity; and (c) determine what and how additional species may be affected as exploration and development move to deeper waters.

(4) The ranges of many of the marine mammal species that occur in the northern Gulf extend beyond areas where oil and gas exploration and development are occurring or are likely to occur in the foreseeable future. Such species may be affected by activities in areas where exploration and development activities are not occurring. To be able to determine likely causes of changes in distribution, abundance, or productivity that may be observed in the northern Gulf, it will be necessary to know the full ranges of the affected species or populations and the activities occurring outside the northern Gulf that may be responsible for the observed changes. Although the Minerals Management Service may need such information to determine whether observed changes are or are not caused by activities under its jurisdiction, it would be unreasonable to expect the Service to attempt to document

where, what, and how activities outside their jurisdiction may be affecting marine mammals or other species within their jurisdiction. Thus, the Service should be working with the National Marine Fisheries Service, the Fish and Wildlife Service, the Environmental Protection Agency, the Navy, and other organizations and agencies in both the United States and other countries to identify and coordinate research and monitoring programs, the results of which could help the Service meet its responsibilities.

(5) The marine mammal stranding network in the northern Gulf of Mexico is an important source of information on the distribution, relative abundance, general health, and frequency and causes of mortality of marine mammals in the northern Gulf, particularly those that inhabit nearshore waters. Such information can be used by the Minerals Management Service to help assess and detect the possible effects of offshore oil and gas exploration and development on coastal marine mammal species. Such information also may be useful for differentiating oil and gas development-related effects from natural changes and effects of other activities. Therefore, the Service should work

with the National Marine Fisheries Service and regional volunteers to ensure that potentially useful data from stranded animals are collected, reported, and archived appropriately.

As noted in the section of Chapter VII concerning the effects of noise, the Minerals Management Service has proposed studies in fiscal year 2000 to measure ambient noise levels and test field methods for better assessing sperm whale responses to development-related sound sources. Further, the Minerals Management Service is working with the National Marine Fisheries Service and the oil and gas industry to identify additional measures that may be necessary to assess and minimize the effects of seismic surveys and related activities on marine mammals in the northern Gulf and elsewhere.

In 2000 the Commission will continue working with the Minerals Management Service and other agencies to better assess and determine how to minimize the effects of offshore oil and gas development on marine mammals and other species.

Chapter IX

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 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 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 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 on marine mammals and their habitats is conducted or supported by a number of federal departments and agencies. To determine the nature of this research and assess ways in which it can best be coordinated and used to facilitate marine mammal conservation, each year the Commission requests information on the marine mammal and related research being conducted, supported, and planned by these departments and agencies.

For the 1999 survey, the Commission requested information from 20 federal agencies, departments,

and offices. They were the Department of Agriculture; the Department of the Air Force; the Department of the Army's Army Corps of Engineers; the Department of Commerce's Office of Ocean and Coastal Resource Management, National Marine Fisheries Service, National Sea Grant College Program, and Office of Ocean Resources Conservation and Assessment, Marine Sanctuaries Division; the Department of Energy; the Department of the Interior's Fish and Wildlife Service, Minerals Management Service, Biological Resources Division of the U.S. Geological Survey, and National Park Service; the Department of the Navy; the Department of State; the Department of Transportation's U.S. Coast Guard; 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.

The information obtained will be summarized in the Commission-sponsored report "Survey of Federally-Funded Marine Mammal Research and Studies FY74-FY99," which will be available from the National Technical Information Service in 2000 (see Appendix B, Waring 1981 through 1999, for previous surveys).

Workshops and Planning Meetings

In 1999 the Marine Mammal Commission provided comments and recommendations to other federal agencies on a broad range of issues affecting the conservation and protection of marine mammals and marine mammal habitats. The issues included protection and recovery of endangered, threatened, and depleted species; interactions between marine mammals and fisheries; the possible direct and indirect effects of coastal and offshore development on marine

mammals; swimming and other interactions with cetaceans; response to marine mammal strandings and unusual mortality events; public display of marine mammals; applications for scientific research permits; and requests for authorization to take small numbers of marine mammals incidental to a variety of industrial, military, and scientific activities.

Members of the Commission, its Committee of Scientific Advisors, and its staff also helped organize or participated in meetings and workshops to:

- review and recommend actions to update or implement recovery plans for Hawaiian monk seals, Florida manatees, Steller sea lions, North Atlantic right whales, humpback whales, and the California population of sea otters;
- review and further develop take reduction plans for the east coast gillnet fishery and other fisheries that incidentally kill and seriously injure harbor porpoises, right whales, and other cetaceans;
- assess the possible use of active sonars to reduce the risk of ships hitting right whales;
- facilitate implementation of the Marine Mammal Health and Stranding Response Program;
- prepare for and participate in the 1999 meetings of the International Whaling Commission and its Scientific Committee, the Antarctic Treaty Consultative Parties, and the Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources;
- oversee U.S. participation in the Arctic Council and its working groups established to give effect to the Arctic Environmental Protection Strategy;
- identify and coordinate federal agency efforts to resolve uncertainties concerning the possible effects of anthropogenic noise on marine mammals;
- review the results of research funded by the Minerals Management Service to determine the species and numbers of marine mammals that might be affected by oil and gas exploration and development in the northern Gulf of Mexico and assess the need for follow-up studies;
- identify uncertainties concerning the effects of chemical contaminants on marine mammals and actions necessary to resolve them;
- review the National Marine Fisheries Service's research program to determine whether dolphin populations that have been depleted due to mortality

associated with the tuna purse seine fishery in the eastern tropical Pacific Ocean are recovering and, if not, whether the failure to recover is due to chase and capture by tuna purse seiners;

- prepare for and participate in the 1999 International Arctic Science Committee's Workshop on the Impacts of Global Change;
- prepare for and participate in the 1999 Society for Marine Mammalogy's 13th Biennial Conference;
- prepare for and participate in the 1999 Mexican Society for the Study of Marine Mammals' 24th International Meeting;
- prepare for the Commission's February 2000 Workshop on Impacts of Changes in Sea Ice and Other Environmental Parameters in the Arctic;
- review the scientific basis for the National Marine Fisheries Service's 3 December 1998 biological opinion regarding the interactions between Steller sea lions and Bering Sea and Gulf of Alaska pollock fisheries; and
- review the possible adverse effects of radio-tagging on right whale behavior and survival.

Commission-Sponsored Research and Study Projects

As funding permits, the Marine Mammal Commission supports research to further the purposes and policies of the Marine Mammal Protection Act. In particular, it convenes workshops and contracts for research and studies to help identify and determine how best to minimize threats to marine mammals and their habitats. Since it was established in 1972, the Commission has contracted for more than 1,000 projects ranging in amounts from several hundred dollars to \$150,000.

Inasmuch as the Commission's research budget is at present essentially non-existent, the Commission's investment in research usually is in the form of transfers of funds from other federal agencies, particularly the National Marine Fisheries Service, the Fish and Wildlife Service, and the Department of State, or from grants that have been made to the Commission. In the past, when the Commission had a substantial research budget, it occasionally would transfer funds to other agencies along with detailed scopes of work

describing precisely what the agency was to do or to have done, including requirements for reporting on progress to the Commission. In many instances, this 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. It also helped ensure that work supported by other agencies addressed priority needs in a non-duplicative, cost-effective manner. The Commission believed that it was essential to maintain agency involvement to the greatest extent possible and that such transfers were a useful means of doing so.

Research and studies supported by the Commission in 1999 are described below. Final reports of most Commission-sponsored studies are available from the National Technical Information Service (NTIS) or directly from the Commission. These are listed in Appendix B. Papers and reports resulting entirely or in part from Commission-sponsored activities and published elsewhere are listed in Appendix C.

WORKSHOPS, REVIEWS, AND ANALYSES

Possible Voluntary Measures to Reduce the Risk of Ships Hitting Northern Right Whales (Bruce A. Russell, JS&A Environmental Services, Chevy Chase, Maryland)

The northern right whale is the most endangered marine mammal in U.S. waters and the most endangered large whale in the world. Its largest population, about 300 individuals, occurs off the east coasts of the United States and Canada. About 36 percent of the known mortality for this population (16 of 46 deaths), based on records of strandings between 1969 and 1999, is attributable to ship strikes. The available data suggest that right whales are far more likely to be hit by ships than are other large whales, possibly because of typical right whale behaviors that occur at or near the surface of the water, such as logging (resting quietly), skim feeding, nursing, and mating, and the species' preference for coastal waters, where vessel traffic is greatest. The contractor has developed a draft list of possible voluntary measures that might be taken by shipping companies with vessels

operating in ports adjacent to critical right whale habitats to reduce the probability of ships hitting right whales. The draft list is to provide the initial focus for discussions with shipping company officials on measures they might take to minimize collisions between their vessels and northern right whales off the eastern seaboard of the United States and Canada. The project, also being supported with funds from the National Marine Fisheries Service, the Georgia Department of Natural Resources, and the Canadian Department of Fisheries and Oceans, is expected to be completed in 2000.

Production of a Promotional Brochure for the CD-ROM Version of *Marine Mammals Ashore* (Valerie J. Lounsbury, National Aquarium in Baltimore, Baltimore, Maryland)

Marine Mammals Ashore: A Field Guide for Strandings by Joseph R. Geraci, V.M.D., Ph.D., and Valerie J. Lounsbury was written to fulfill the need for training material and standardized protocols for tissue and data collection by U.S. regional stranding networks. It also provides an overview of marine mammal biology and social behavior as related to strandings. The guide, published in 1993, is now out of print. In response to continuing demand, the National Marine Fisheries Service's Office of Protected Resources and the National Ocean Service, in cooperation with the authors and the National Aquarium in Baltimore, produced a CD-ROM version that incorporated and updated information in the original book. The CD-ROM version also includes new information on special collection protocols, U.S. and international stranding network contacts, and data forms. The Marine Mammal Commission, which contributed to production of the original book, also contributed to production of a promotional brochure for the CD-ROM version of *Marine Mammals Ashore: A Field Guide for Strandings*. A portion of the proceeds from the sales are donated to the Marine Mammal Unusual Mortality Event Fund. Order forms are available on the National Aquarium's website at www.aqua.org/animals/conservation/cdrom.html.

Status Review of Beluga Whales (*Delphinapterus leucas*) in Russian Waters (Randall R. Reeves, Ph.D., Okapi Wildlife Associates, Hudson, Quebec, Canada)

Early in September 1999 the Marine Mammal Commission received an unconfirmed report that one or more importers in Japan had contracted with Russian hunters to buy 200 tons of meat and blubber from beluga whales for sale in Japan. The Russian Federation apparently had authorized the take of up to 2,100 animals: 500 from the Barents Sea; 500 from the Bering Sea; 900 from the Sea of Okhotsk; 100 from the White Sea; and 100 from waters off the western coast of the Kamchatka Peninsula. At the time, it was not known for certain where the whales had been or were to be taken; neither was it known whether the status of the potentially affected beluga whale populations had been assessed. Further, it was not known whether the effects of the removals on the populations had been considered.

The contractor provided a report that (1) summarized and analyzed available data on the discreteness, status, and past and current removals from the five beluga whale stocks mentioned above; (2) where possible, estimated the sustainable removal level for each population; (3) identified relevant stock assessments and management recommendations provided by the International Whaling Commission's Scientific Committee; and (4) where possible, identified the responsible management authority or authorities in the Russian Federation and determined what research, monitoring, and management programs were in place to ensure that the levels of removal were sustainable. The information provided in this report prompted the Commission to write letters to the State Committee of the Russian Federation for Environmental Protection and the U.S. Department of Commerce. As discussed in Chapter V in the section on the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the Commission's letters expressed reservations about the ecological acceptability of the proposed harvest and questioned the appropriateness of the proposed export to Japan. The harvest ultimately was halted.

Workshop on Impacts of Changes in Sea Ice and Other Environmental Parameters in the Arctic (National Fish and Wildlife Foundation, Washington, DC)

It is becoming increasingly clear that the world's climate is changing. Over the past 30 years, the seasonal sea ice in the Bering Sea appears to have been getting thinner, forming later, and breaking up earlier. These sea ice changes may be a product of global climate change and, if they continue, will affect the distribution, abundance, and productivity of fish and wildlife resources on which many Alaska Natives and communities depend for subsistence. The Marine Mammal Commission, with support from the University of Alaska's North Pacific Marine Research Initiative, the National Oceanic and Atmospheric Administration, and the National Marine Fisheries Service, is holding a Workshop on Impacts of Changes in Sea Ice and Other Environmental Parameters in the Arctic. Workshop arrangements are being made through the National Fish and Wildlife Foundation.

The purposes of the workshop are to review, from both traditional knowledge and scientific perspectives, how changes in sea ice and other environmental parameters may be affecting Arctic living resources and the Native cultures and practices that depend on those resources, and to identify possible measures that can be taken to mitigate the impacts of realized and anticipated changes. The workshop, which will involve representatives of the Native, scientific, and environmental communities, will be held in Girdwood, Alaska, 15-17 February 2000. It is anticipated that the workshop will help determine (1) whether Native observations of environmental change in the Bering Strait region are supported by independent environmental data; (2) whether there are significant gaps in current scientific investigations of environmental changes and their implications in the Bering Strait region and, if so, what they are and how they can be filled; (3) similarities and differences between Native traditional knowledge and formal scientific observations, and further identify promising areas of collaborative efforts including synthesis, research, and monitoring; (4) how well we understand the potential impacts that environmental changes may have on subsistence communities and identify possible ways to minimize those impacts; (5) if the results from the

Bering Strait region are applicable to the Arctic region as a whole; and (6) what should be done next, locally, regionally, and internationally, in anticipation of further significant changes in the Arctic environment.

The Value of Sanctuaries and Reserves (Protected Areas) as Tools for Conserving Marine Mammals (Randall R. Reeves, Ph.D., Okapi Wildlife Associates, Hudson, Quebec, Canada)

Domestic and international legislation provides for the protection of marine areas to further conservation goals. However, it is not clear whether areas afforded special protection are being selected and managed to optimize their value as conservation tools. It also is not clear whether the statutes and agreements that authorize designation of specially protected areas provide for or appropriately encourage protection and effective management of the full range of areas meriting protection. To evaluate the use of marine sanctuaries and reserves as conservation tools, the contractor has been asked to (1) identify and describe the key elements of federal and state statutes and international agreements that provide for the establishment of various types of marine protected areas to meet general or specific conservation goals; and (2) select and evaluate representative statutes and protected areas as case studies to determine the effectiveness of current management approaches and steps that usefully might be taken to improve their effectiveness, particularly with respect to marine mammals. The report, to be completed in 2000, will be made available to appropriate federal and state agencies for use in managing existing marine sanctuaries and reserves and designating new ones.

GENERAL

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

The Marine Mammal Protection Act requires that the Marine Mammal Commission conduct a continuing review of marine mammal research conducted or supported by federal agencies. Information concerning marine mammal research conducted or supported

by other federal agencies in fiscal year 1999 will be forwarded to the contractor, who will prepare a draft report synthesizing the information. The draft will be sent to the responding agencies to verify the accuracy of the information. The final report is expected to be completed by mid-2000. It will be reviewed by the Commission, in consultation with its Committee of Scientific Advisors, to identify possible duplicative research and how research might be planned and carried out cooperatively to avoid duplication. The report will be available through the National Technical Information Service.

Assessment of the Activities of the Arctic Council and its Subsidiary Working Groups (Henry P. Huntington, Ph.D., Huntington Consulting, Eagle River, Alaska)

In 1991 the eight Arctic nations (Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, and the United States) adopted the Arctic Environmental Protection Strategy, through which they address issues of pollution and conservation on a circumarctic basis. In 1996 the Arctic Council was established by the eight Arctic nations as a high-level forum to build upon the Arctic Environmental Protection Strategy so as to better address issues of common concern, in particular issues of environmental protection and sustainable development. The Council has subsumed the four programs and working groups established to help implement the Arctic Environmental Protection Strategy. They are the Arctic Monitoring and Assessment Program; Conservation of Arctic Flora and Fauna; Emergency Prevention, Preparedness, and Response; and Protection of the Arctic Marine Environment. The Council also has established a Sustainable Development Working Group. Persons designated by each nation as senior Arctic officials act as liaisons and provide coordination of activities between the biennial meetings of the Council. The contractor represented the Commission at the two meetings of the senior Arctic officials and at meetings of the Sustainable Development Working Group and the Working Group on Conservation of Arctic Flora and Fauna, as discussed in Chapter IV.

Chapter X

PERMITS AND AUTHORIZATIONS TO TAKE MARINE MAMMALS

The Marine Mammal Protection Act places a moratorium, subject to certain exceptions, on the taking and importing of marine mammals and marine mammal products. The Act defines taking to mean "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal." One exception to the moratorium provides for the issuance of permits by either the Secretary of Commerce or the Secretary of the Interior, depending on 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.

Amendments enacted in 1994 allow the issuance of permits to authorize the taking of marine mammals in the course of educational or commercial photography and for importing polar bear trophies from sport hunts conducted in Canada. Permit-related activities involving polar bear trophies and the export of marine mammals to foreign facilities are discussed in Chapters III and XI, respectively. Other permit-related activities are addressed here.

Also discussed in this chapter are interactions between wild marine mammals and members of the public who seek to approach, swim with, photograph, or feed wild marine mammals. Such direct interactions have become increasingly common in recent years. In many cases they clearly constitute harassment as defined under the Marine Mammal Protection Act and its implementing regulations. In other instances the responsible agencies must determine on a case-by-case basis whether marine mammals have been harassed. Steps to address interactions involving bottlenose dolphins and elephant seals are discussed.

Other provisions of the Marine Mammal Protection Act allow the Secretaries of Commerce and the Interior to authorize the take of small numbers of marine mammals incidental to activities other than commercial fisheries, provided the taking will have only a negligible impact on the affected stocks. Small-take authorizations incidental to several activities are also discussed in this chapter.

Permit-Related Regulations

In 1993 the National Marine Fisheries Service published a proposed rule that would have made extensive revisions to its permit regulations. However, many of the proposed changes, particularly those for public display permits, were nullified by the 1994 amendments to the Marine Mammal Protection Act. The Service therefore determined that it could issue final regulations only for some elements of its permit program based on the 1993 proposal and that it would need to publish new proposed rules for others. On 10 May 1995 it issued a final rule instituting several changes to its permit regulations, including some revisions to reflect the provisions of the 1994 amendments. These regulations, discussed in the Commission's 1997 annual report, did not include permit requirements for educational and commercial photography; neither did they reflect many of the 1994 amendments pertaining to public display. Proposed revisions to the public display regulations are expected to be published in the spring of 2000, and a separate rulemaking to promulgate regulations for educational and commercial photography permits is planned for late in 2000. Pending adoption of new regulations, the Service intends to continue to process applications and implement the Act's requirements for public display and photography permits using existing

regulations, interim guidelines, and applicable statutory provisions.

In addition to authorizing permits for scientific research, the Marine Mammal Protection Act, as amended in 1994, includes a general authorization for scientific research that involves taking only by level B harassment (*i.e.*, acts of pursuit, torment, or annoyance that may disturb, but not injure, a marine mammal or marine mammal stock in the wild). Researchers conducting aerial surveys, photo-identification studies, or other activities likely to cause no more than simple disturbance typically are covered by this general authorization and are no longer required to obtain a permit. However, researchers conducting such activities on marine mammals listed as endangered or threatened under the Endangered Species Act still must obtain permits. Interim regulations implementing the general authorization were issued by the National Marine Fisheries Service on 3 October 1994. In its comments on the interim regulations, the Commission noted several areas in which the regulations deviate from the statutory requirements and need to be clarified. The Service has indicated that final regulations, taking into account comments by the Commission and others, will be published in 2000.

Since enactment of the general authorization in 1994, from 6 to 16 researchers a year have availed themselves of this streamlined authorization process and received letters confirming that their activities may appropriately be conducted under the general authorization. It appears that, for certain types of research, the general authorization has alleviated delays associated with issuing permits for such activities. As noted above, one limitation on the usefulness of the general authorization is that it is not available for activities that may take endangered or threatened marine mammals. The Commission, therefore, in its 29 June 1999 testimony before the House Resources Committee's Subcommittee on Fisheries Conservation, Wildlife, and Oceans regarding reauthorization of the Marine Mammal Protection Act, recommended that the general authorization be expanded to include marine mammals listed under the Endangered Species Act.

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 permit provisions of the Marine Mammal Protection Act and related legislation. The Fish and Wildlife Service subsequently informed the Commission that it intended to defer adoption of revised permit regulations until the National Marine Fisheries Service finished its review of the applicable permit regulations. The Fish and Wildlife Service expected to propose its own regulations at that time, drawing on the National Marine Fisheries Service's regulations as appropriate. In its 29 June testimony before Congress, the Commission noted that, although required by statute to have promulgated regulations for the general authorization within 120 days of enactment of the 1994 amendments, the Fish and Wildlife Service had yet to publish a proposed rule. As of the end of 1999 the Service had yet to propose revisions to its Marine Mammal Protection Act permit regulations to reflect either the changes implemented by the National Marine Fisheries Service or the amendments to the Marine Mammal Protection Act enacted in 1994.

Permit Application Review

Permits for scientific research, public display, species enhancement, and photography all involve the same four-stage review process: (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 receipt 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 after consideration of comments and recommendations by the Commission and the public. If captive maintenance of animals is involved, the views of the Animal and Plant Health Inspection Service on the adequacy of facilities and transportation arrangements also must be considered.

Once issued, a permit can be amended by the responsible agency, provided the proposed change

meets statutory and regulatory requirements. Depending on the extent of the proposed change, an amendment may be subject to the same notice, review, and comment procedures as the original permit application. Major amendments, such as requests to extend work more than 12 months, to take additional animals, or to take animals in ways not originally authorized, are subject to review by the Commission.

The total review time for a permit (from initial receipt of an application by either department to final action) depends on many factors, including the completeness 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 agencies. During 1999 the Commission, in consultation with its Committee of Scientific Advisors, provided recommendations on 24 permit applications submitted to the Department of Commerce and 10 applications submitted to the Department of the Interior. Of these, seven awaited final action by the Department of Commerce and four awaited final action by the Department of the Interior at the end of 1999. The Commission's average review time — from the point at which the application was considered complete to the submission of the Commission's final letter of recommendation — for the 34 applications on which it commented in 1999 was 35 days (range: 10-99 days). The Commission also made recommendations on 24 requests to amend permits in 1999. The average time for Commission review of these requests was 30 days.

The Department of Commerce issued 24 permits during 1999, including 10 permit applications that had been received in 1998. The average processing time, from the date the application was received by the Department until final action was taken, was 176 days (range: 59-427 days).

The Department of the Interior issued eight permits during 1999, including three applications that had been received in 1998. Its average processing time was 182 days (range: 45-442 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 in 1999 were 149 and 121 days, respectively, compared with 94 and 125 days in 1998.

Interactions with Marine Mammals in the Wild

In recent years, there has been a widely recognized, but largely unquantified, increase in direct interactions between members of the public and wild marine mammals. These activities typically involve close approaches to observe, photograph, pose with, touch, or otherwise interact with animals. Other cases have involved feeding animals, including some cases in which commercial tour operators regularly feed particular groups of wild marine mammals to encourage them to approach their vessels. Passengers then pay a fee to view, feed, or swim with the marine mammals (see Fig. 13).

Although such activities generally are not motivated by a desire to harm animals, they can pose substantial risks to both the humans and wild marine mammals involved. For example, people may not fully appreciate the risk of injury or even death from being bitten, rammed, or otherwise attacked by wild animals. In addition, animals may be driven from preferred habitat, injured by people wishing to touch or prod them, debilitated by inappropriate, contaminated, or spoiled food, or have their behavior changed in ways that encourage them to interact with humans engaged in other activities and become pests. Because such human interactions can disturb or injure wild marine mammals, they constitute harassment under the Marine Mammal Protection Act. In this regard, the National Marine Fisheries Service revised its regulatory definition of the term "take" to include feeding marine mammals in the wild. Feeding is therefore clearly prohibited.

Two instances in which concerns involving specific types of interactions have increased are discussed below. A third, involving harassment of harbor seals, California sea lions, and elephant seals hauled out at the La Jolla Children's Pool, is discussed in the small-take authorizations section of this chapter.

Interactions with Bottlenose Dolphins in the Southeastern United States

In recent years, commercial operators have begun offering public tours featuring opportunities to swim

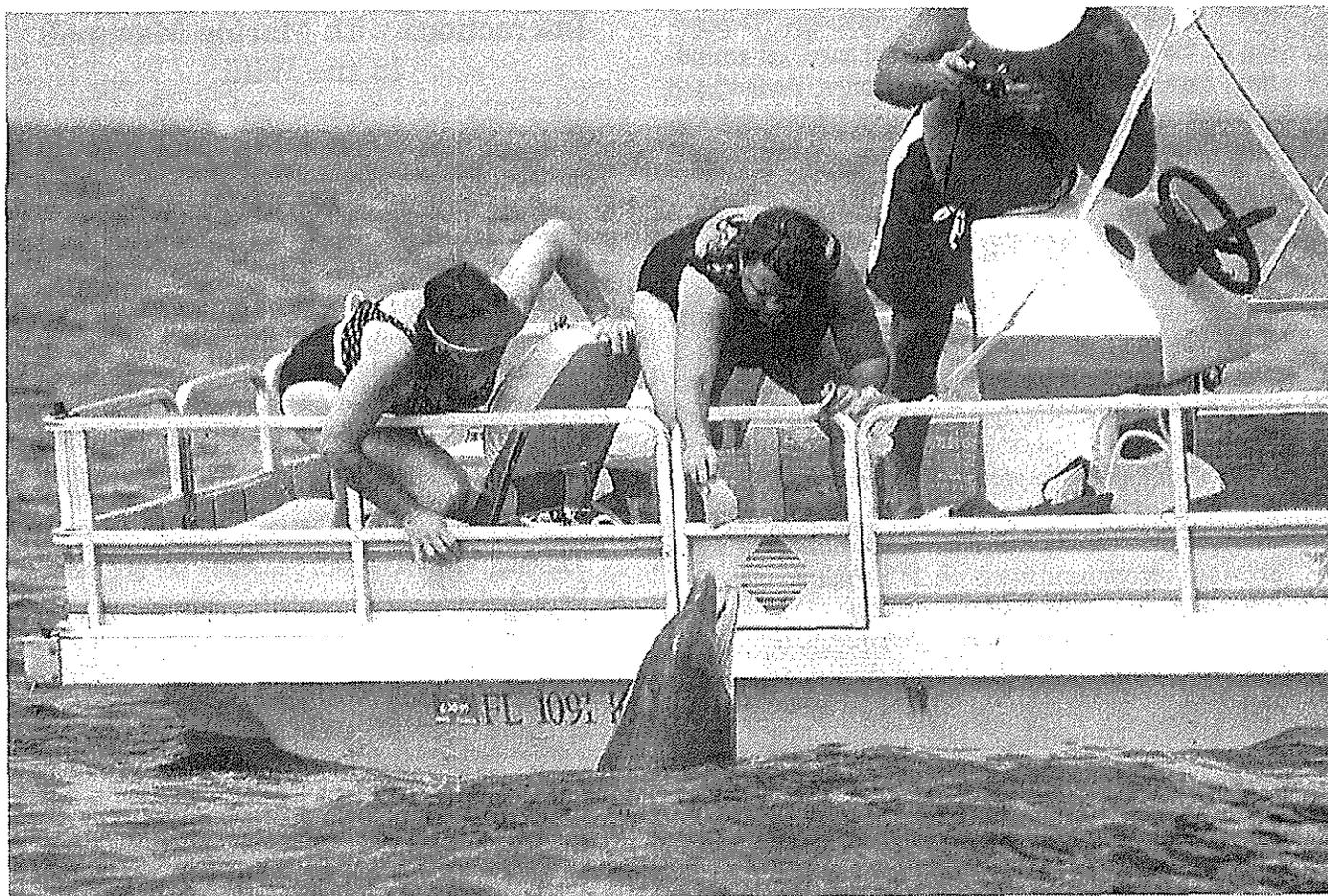


Figure 12. Recreational boaters feeding bottlenose dolphins in Florida.

with marine mammals in the wild. In many cases, swim programs appear to be facilitated by attracting the dolphins using food. To date, most of these operations have involved bottlenose dolphins in nearshore waters off the southeastern United States. As noted above, swimming with, feeding, and otherwise directly interacting with marine mammals in the wild can be dangerous for both the people and the animals involved. Even when no immediate injury results, marine mammals may become habituated to people and boats. This can embolden the animals and expose them to risks they might not otherwise face.

In light of these concerns, in December 1996 the Commission wrote to the National Marine Fisheries Service about the proliferation of recreational and commercial ventures featuring such interactions in the

southeastern United States. The Commission recommended that the Service take steps to advise both the public and tour operators that direct interactions constitute a taking of marine mammals without proper authorization and are against the law. The Commission noted that the regulatory definition of “take” includes feeding marine mammals in the wild and, as such, feeding bottlenose dolphins to attract them, or as part of a tour, clearly violates the Marine Mammal Protection Act.

In response to the Commission’s recommendations, the Service instructed its enforcement agents to pay more attention to these violations. In addition, in May 1997 the Service contracted with the Florida Marine Patrol to provide additional enforcement through the end of 1997. In July 1997 the Commis-

sion wrote to commend the Service for this effort and requested information on the status of the enforcement contract with the Florida Marine Patrol. The Commission was pleased to learn that in 1998 the Service assigned federal enforcement officers the tasks of preventing feeding and other activities that result in the harassment of dolphins. In 1999 staff members in the Service's Southwest Region began drafting marine mammal viewing guidelines. These guidelines will be included in a brochure that will be used to advise the public on appropriate ways to interact with marine mammals in the wild.

Despite these efforts, swimming and feeding activities in the southeastern United States have not abated and, in fact, appear to have increased. In 1998 the Commission, in cooperation with the Service, contracted with researchers to conduct a pilot study of interactions between humans and bottlenose dolphins near Panama City Beach, Florida. The objectives were to assess interactions between humans and dolphins and to design a more thorough study to evaluate how habitual in-water interactions with humans affect the behavior of wild bottlenose dolphins. A report of the pilot study, submitted in August 1998, described numerous encounters between humans and dolphins and noted that it seems likely that virtually all observed interactions between dolphins and humans in the region were based on attracting dolphins with food. To further evaluate such interactions, the Commission contracted for a literature review to compile information on human interactions with both marine and terrestrial animals in the wild. The literature review, accompanying database, and final report are expected to be submitted in 2000.

Interactions with Elephant Seals in California

Since recovery from near-extinction due to over-harvesting in the late 1800s and early 1900s, northern elephant seals have begun to establish colonies on beaches along the California mainland. In 1978 they were first noticed near Point Piedras Blancas, San Simeon, California. Prior to 1990 their numbers remained low, never exceeding more than two or three individuals at any one time. In December 1990, however, more than 170 seals hauled out at that location, and in January 1992 the first birth was reported. By 1994 more than 3,000 animals were

hauled out during the spring molting season, and almost 300 births were recorded. As many as 5,000 elephant seals now arrive during the spring molt, and more than 1,900 seals gave birth in 1999. Many of these seals use beaches that are visible and readily accessible from the coastal highway, and by 1994 the beaches had become a major seasonal tourist attraction. Large numbers of cars were parked on the shoulder of the road while people hiked down to the beach to walk among the seals.

Northern elephant seals, the world's second largest pinniped, can weigh more than 2,500 kg (5,500 pounds) and move with surprising speed on land as well as at sea. Concerned about interactions between people and elephant seals, the Commission wrote to the California Department of Fish and Game on 16 December 1994 noting the rapid increase in numbers of animals, the growing numbers of areas occupied by seals, the attendant risk of injury or death to humans walking among the seals, the possibility of disease transmission to the seals from dogs, and the risks to seals and automobile occupants should a seal be struck by a car on Highway 1. The Commission also suggested that responsibility for coordinating efforts to deal with the problems be vested with one state agency.

In January 1995 the California Department of Fish and Game wrote back, acknowledging that the problem was serious and describing what was being done. Also in January 1995 the National Biological Service's Piedras Blancas Research Station completed a report documenting, among other things, the routine occurrence of inappropriate behavior by people. Efforts to address the problem through such actions as increased official presence on weekends were only partially effective, and it was not until 1997, when the California Department of Transportation installed a fence between the highway and one of the beaches used by the seals, that significant progress was made. During the 1997-1998 breeding season (mid-December through February), the fence effectively kept elephant seals from reaching the highway; however, at nearby beaches with no fencing, three subadult male seals were killed by vehicles and two people were hospitalized with injuries from these accidents. In 1998 the Commission provided funding to install approximately 0.65 km (0.4 mile) of additional fencing in two

separate areas north of Piedras Blancas. The fencing, erected in January 1999, appears to have been effective because there were no reports of seals on the highway during 1999.

The extended fencing, combined with expanded public education efforts, has also helped decrease interactions between people and elephant seals on the beaches. Friends of the Elephant Seal, a citizens' group formed in response to the situation, has posted volunteer docents on the beaches during the elephant seal breeding season to help educate the public about the species and the potential dangers of close encounters with the seals. Unfortunately, there remains one area of the Hearst Ranch on which the Friends of the Elephant Seal have not been invited to place docents, and unsupervised interactions between elephant seals and humans are taking place. In other places, increased enforcement by the California State Highway Patrol, the National Marine Fisheries Service, and the Monterey Bay National Marine Sanctuary are helping to alleviate the problem.

Small-Take Authorizations

Section 101(a)(5) of the Marine Mammal Protection Act directs the Secretaries of the Interior and Commerce to authorize the unintentional taking of small numbers of marine mammals by U.S. citizens incidental to activities other than commercial fishing when certain conditions are met. This section was added to the Act in 1981 to eliminate the requirement to obtain a procedurally burdensome waiver of the Act's moratorium on taking of marine mammals when the number of animals likely to be affected is small and the impacts on the size and productivity of the affected species or populations are likely to be negligible. The section was amended in 1986 to allow authorizing the taking of small numbers of depleted, as well as non-depleted, species and populations. All forms of incidental taking, including lethal taking, may be authorized under section 101(a)(5)(A). A new provision, section 101(a)(5)(D), was added to the Act in 1994 to streamline the means of obtaining small-take authorizations when the taking is by harassment only.

Authorizations under section 101(a)(5)(A) require promulgation of regulations setting forth permissible methods of taking and requirements for monitoring and reporting, as well as a finding that the incidental taking will have negligible effects on the size and productivity of affected species or stock. Authorization of incidental harassment under section 101(a)(5)(D) does not require promulgation of regulations. Rather, within 45 days of receiving an application that makes the required showings, the Secretary is to publish a proposed authorization and notice of availability of the application for public comment in the *Federal Register* and in newspapers and appropriate electronic media in communities in the area where the taking would occur. After a 30-day comment period, the Secretary has 45 days to make a final determination on the application. Authorizations under section 101(a)(5)(A) may be issued for periods up to five years. Authorizations under section 101(a)(5)(D) may be issued for periods up to one year. Both types of authorizations may be renewed.

Requests for small-take authorizations considered by the Commission in 1999 are described below.

Authorizations under Section 101(a)(5)(A)

Incidental Take of Walruses and Polar Bears — Regulations governing the issuance of letters of authorization to take walruses and polar bears incidental to oil and gas activities in the southern Beaufort Sea and adjacent areas off Alaska were promulgated by the Fish and Wildlife Service in November 1993. In August 1995 the regulations were modified and extended to apply through 15 December 1998. As noted in the Commission's previous report, the Service on 17 November 1998 published in the *Federal Register* a proposed finding of negligible impact and proposed regulations to govern the authorization and monitoring of the incidental taking of walruses and polar bears in the course of oil and gas exploration and development off the North Slope of Alaska for an additional five-year period.

On 28 January 1999 the Service published final regulations to govern authorization of the unintentional take of small numbers of polar bears and Pacific walruses incidental to oil and gas exploration and development activities in the Beaufort Sea and

adjacent coastal areas of Alaska through 30 January 2000. The *Federal Register* notice announcing the regulations indicated that the Service intended to consider new information associated with subsea pipeline construction and, at a minimum, to propose early in 2000 an extension of the regulations for an additional four years.

In accordance with the regulations, letters of authorization are issued without opportunity for public review or comment. In 1999 the Fish and Wildlife Service issued 32 letters of authorization to take polar bears and walrus incidental to oil and gas exploration and development activities off Alaska. The authorizations were issued to Arco Alaska, Inc. (15); BP Exploration (Alaska), Inc. (10); Western Geophysical (4); Fairweather Geophysical (2); and Exxon Company U.S.A. (1). The authorization notices were published in the *Federal Register* on 18 March, 28 June, 1 September, 4 October, and 1 December 1999.

On 9 December 1999 the Service published in the *Federal Register* a proposed negligible impact finding and proposed regulations to govern authorization of the unintentional take of small numbers of polar bears and Pacific walrus incidental to oil and gas activities in the Beaufort Sea and adjacent coastal areas of Alaska for a three-year period, beginning on 31 January 2000. At the end of the year, the Commission, in consultation with its Committee of Scientific Advisors, was reviewing the proposed regulations and related information and expected to provide comments to the Service early in January 2000.

Development of Production Facilities at the Northstar and Liberty Sites in the Beaufort Sea —

On 25 November 1998 BP Exploration (Alaska), Inc. submitted a request to the National Marine Fisheries Service for promulgation of regulations to authorize the taking of small numbers of bowhead whales, gray whales, beluga whales, ringed seals, bearded seals, and spotted seals incidental to construction and operation of oil and gas production facilities at the Northstar and Liberty sites off the north coast of Alaska. The application notice and request for comments were published in the *Federal Register* on 1 March 1999.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the application and commented to the Service on 31 March 1999. The Commission noted that the request for regulations, under which annual letters of authorization to take marine mammals could be issued for a period of five years, was reasonable provided that programs are in place to ensure that only authorized taking occurs, that any effects on the size and productivity of the affected marine mammal stocks are negligible, and that there are no unmitigable adverse effects on the availability of the affected marine mammals to Alaska Natives for subsistence uses. The Commission recommended that the Service initiate the rulemaking as requested, provided that it was satisfied that the planned marine mammal and related monitoring programs would be adequate to verify how and over what distances marine mammals may be affected, that only small numbers of marine mammals are taken, and that cumulative impacts on the affected species and stocks are negligible.

With regard to monitoring, the Commission noted that site-specific monitoring may be insufficient to detect changes in the potentially affected species and stocks that could be caused by activities over the project's anticipated 20-year life span. The Commission recommended that the Service specify in the regulations that proposed monitoring plans and the results of the monitoring programs must be reviewed annually by the Service and independent experts to confirm that the programs are capable of detecting any non-negligible, cumulative, population-level effects and that the requirements will be revised if there is uncertainty in this regard. The Commission also recommended that the Service consult with the Fish and Wildlife Service to determine whether interactions between polar bears and ringed seals could be affected by the planned activities and, if so, to cooperatively specify monitoring requirements.

With regard to ringed seals, the Commission noted that the application indicated that dogs would not be used to locate ringed seal pupping lairs because of the possibility that dogs could disrupt seals and leave odors that could attract polar bears or foxes to the lairs. The Commission questioned whether a visual survey alone would be sufficient to detect seal lairs in the vicinity of the proposed activities and thereby

ensure that the activities would have the least practicable adverse impact. The Commission advised that, if the Service concurred that the use of dogs would put ringed seals at risk, it should consider alternative methods to locate lairs that could be affected after the beginning of the spring pupping season.

Finally, the Commission noted that the application indicated that as many as 1,380 bowhead whales possibly could be taken annually by harassment incidental to Northstar construction and operation and appeared to request that the regulations and letters of authorization allow intentional hazing of whales and seals to reduce the likelihood of them encountering oil if a spill occurs. The Commission pointed out that intentional taking cannot be authorized under section 101(a)(5)(A). Further, the Commission noted that it was not clear why possible cumulative effects on bowhead whales were expected to be negligible or why a take of up to 1,380 whales annually (6,900 over five years) was considered a small number.

On 14-15 October 1999 the Service held a workshop at the National Marine Mammal Laboratory in Seattle to assess requirements and means for monitoring the effects of on-ice activities on ringed seals. A member of the Commission's Committee of Scientific Advisors participated in the workshop.

On 22 October 1999 the National Marine Fisheries Service published proposed regulations to govern authorizing the take of bowhead whales, ringed seals, and other marine mammals under its jurisdiction incidental to construction and operation of the Northstar site. The Commission, in consultation with its Committee of Scientific Advisors, provided comments to the Service by letter of 21 December 1999.

The Commission concurred with the Service's preliminary determination that construction and operation of production facilities at the Northstar site are likely to have negligible impacts on marine mammals and no unmitigable adverse impact on the availability of marine mammals for taking by Alaska Natives for subsistence. The Commission noted, however, that available information is insufficient to be confident that there will in fact be no significant adverse effects on either marine mammals or their availability to Alaska Natives, particularly over the 15

to 20 years during which production and related activities are expected to occur. Further, the Commission noted that it was not clear whether the ongoing and proposed research and monitoring programs would be sufficient to detect non-negligible effects in time to take steps to assure that they do not lead to long-term or irreversible population-level effects. In this regard, the Commission pointed out that it was not clear (1) whether the estimate of the number of bowhead whales that might be affected considered the year-to-year variation in the path of the fall bowhead migration; (2) whether the proposed acoustic monitoring of the fall bowhead whale migration would, in fact, be able to detect changes in behavior or movement patterns that could affect the survival or productivity of the whales or their availability to Alaska Natives; (3) whether consideration had been given to the various ways that the planned construction activities could affect polar bears through effects on ringed seals; (4) whether proposed surveys for ringed seal breathing holes and pupping lairs would be sufficient to detect any changes in ringed seal distribution, densities, or behavior due to activities such as road and pipeline construction; and (5) whether monitoring of polar bears required by regulations and letters of authorization issued by the Fish and Wildlife Service would be coordinated with the ringed seal monitoring required by letters of authorization issued by the National Marine Fisheries Service to ensure that the noted uncertainties are resolved.

Among other things, the Commission recommended that, if it had not already done so, the National Marine Fisheries Service (1) review data from past bowhead whale surveys conducted by the Minerals Management Service to determine whether such surveys are likely to provide sufficient information to assess the efficacy of the proposed acoustic monitoring of the fall bowhead migration; and (2) if the Minerals Management Service's surveys are judged unlikely to provide sufficient data, require that additional aerial surveys be done during the Northstar construction phase to document the efficacy of the acoustic monitoring program. In addition, the Commission recommended that the Service, if it had not already done so, consult with the Fish and Wildlife Service to determine whether the monitoring program proposed by BP Exploration (Alaska), Inc. is sufficient to detect and verify the negligible significance of

any changes in the distribution, densities, or behavior of ringed seals and polar bears caused by construction and operation of production facilities at the Northstar site and, if not, take steps necessary to correct the deficiencies in the program.

Finally, the Commission noted that the 22 October 1999 *Federal Register* notice made no mention of the oil spill contingency plan developed by the applicant and approved by the Alaska Department of Environmental Conservation, the Coast Guard, and the Minerals Management Service. The Commission recommended that the Minerals Management Service (1) review the contingency plan and related information to ensure that the risk of oil spills had been estimated appropriately, that the planned measures for containing and cleaning up oil spills in both open-ocean and ice-covered areas were likely to be effective and that everything feasible would be done to minimize the impacts of both the oil and containment and clean-up operations on marine mammals; (2) require that the contingency plan be modified if everything feasible had not been done to minimize the risks of oil spills impacting marine mammals; and (3) provide for periodic site inspections, as part of the long-term monitoring program, to ensure that the contingency plan could be implemented as necessary. The Commission also recommended that an assessment of the contingency plan and related monitoring programs be included in any *Federal Register* notice published to promulgate final regulations authorizing the taking of marine mammals incidental to construction and operation of production facilities and related activities at the Northstar site.

Taking Incidental to Operation of the Seabrook, New Hampshire, Nuclear Power Plant — On 16 June 1997 the North Atlantic Energy Service Corporation submitted to the National Marine Fisheries Service a request for a five-year authorization to take small numbers of harbor, gray, harp, and hooded seals incidental to operation of the nuclear power plant in Seabrook, New Hampshire. The application indicated that cooling water for the plant is drawn through tunnels from three intake structures located about 1 mile (1.6 km) offshore and that, since 1993, the remains of 27 to 33 seals had been found in holding bays at the terminus of the intake tunnels. The letter transmitting the application noted that

studies were being done to determine steps that might be taken to minimize entrapment of seals.

As noted in the Commission's previous report, the National Marine Fisheries Service published proposed regulations to authorize the incidental taking on 25 August 1998. The Commission, in consultation with its Committee of Scientific Advisors, provided comments on the proposed regulations to the Service by letter of 8 October 1998. On 25 May 1999 the National Marine Fisheries Service published final regulations to govern the unintentional take of small numbers of seals incidental to routine operation of the power plant. Among other things, they required the North Atlantic Energy Service Corporation to report, within six months, on possible measures that could be taken to effect the least practicable adverse impact on the seals. Anticipating this requirement, and desiring to prevent or minimize the entrapment of seals in the water intake system, the North Atlantic Energy Service Corporation sponsored a workshop on 28-29 January 1999 to identify and evaluate possible mitigation measures. The workshop report, provided to the Commission in April 1999, recommended the installation of vertical barriers on each of the three water intakes to prevent seals from entering the intakes. Such barriers subsequently were installed on all three offshore water intakes.

On 22 December 1999 the North Atlantic Energy Service Corporation advised the National Marine Fisheries Service that no seals had been entrapped in the water intake system since 18 August 1999 when installation of the barriers had been completed. The Commission commends the North Atlantic Energy Service Corporation for its prompt and effective action.

Taking of Harbor Seals and California Sea Lions Incidental to Rocket Launches from Vandenberg Air Force Base — After section 101(a)(5)(D) was added to the Marine Mammal Protection Act in 1994, the U.S. Air Force requested and received a series of one-year authorizations to take harbor seals and possibly other marine mammals incidental to launches of Delta II, Titan II, Titan IV, Taurus, and Lockheed Martin rockets at Vandenberg Air Force Base on the central California coast. As noted in previous reports, the Commission has expressed the

view that, if launches of these and other rockets from Vandenberg Air Force Base are expected to continue indefinitely, it would be more appropriate to obtain a five-year authorization under section 101(a)(5)(A) of the Act, rather than annual authorizations for each type of vehicle. The Commission also has questioned whether the monitoring required by the National Marine Fisheries Service has been sufficient to detect possible long-term cumulative adverse effects.

On 30 September 1997 the Air Force applied to the National Marine Fisheries Service for a five-year small-take authorization under section 101(a)(5)(A). Notice of receipt of the application and proposed regulations to authorize the unintentional take of harbor seals and sea lions incidental to rocket launches at Vandenberg Air Force Base were published in the *Federal Register* on 21 July 1998. The Commission's comments on the application and the proposed regulations were provided to the National Marine Fisheries Service on 2 September 1998 and are discussed in the previous annual report.

Final regulations were published by the Service on 1 March 1999. The regulations, effective through 31 December 2003, specify measures that must be taken to minimize, to the greatest extent practicable, the adverse impacts of the rocket launches and related activities on marine mammals. They also specify research and monitoring required to confirm that any impacts on the size and productivity of the potentially affected marine mammal populations are negligible.

On 2 April 1999 the Service issued a letter of authorization to the 30th Space Wing, Department of the Air Force, in accordance with the regulations issued on 1 March. The authorization, valid until 1 April 2000, specifies research, monitoring, and reporting that must be conducted during the period of authorization.

On 3 August 1999 the Air Force requested that the letter of authorization be modified to include taking incidental to launches of the Minotaur, a modified Minuteman II rocket not included in the authorization issued on 2 April. Notice of the request was published in the *Federal Register* on 8 August 1999. The Commission, in consultation with its Committee of Scientific Advisors, reviewed the request and by letter

of 8 September 1999 advised the Service that it believed the requested modification should be granted, provided that the Service is satisfied that the marine mammal monitoring being done will detect any possible cumulative adverse effects.

Taking of Bottlenose and Spotted Dolphins Incidental to Oil and Gas Structure Removals in the Gulf of Mexico — In 1989 the American Petroleum Institute, representing companies that remove structures no longer being used for oil and gas activities in the Gulf of Mexico, requested authorization from the National Marine Fisheries Service to take small numbers of bottlenose dolphins and spotted dolphins incidental to structure removal. Regulations governing taking of the two species incidental to structure removal were published in the *Federal Register* on 12 October 1995. The regulations, effective through 13 November 2000, authorize the issuance of letters of authorization to harass up to 200 dolphins per year.

On 3 May 1999 the National Marine Fisheries Service published a *Federal Register* notice indicating that one-year letters of authorization had been issued to Amerada Hess Corporation of Houston, Texas, on 29 December 1998; Taylor Energy Company of New Orleans, Louisiana, on 27 January 1999; Vastar Resource, Inc., and Sonat Exploration Co., both of Houston, Texas, on 1 March 1999; and Samedan Oil Corporation of Houston, Texas, and Chevron U.S.A. Production Company of New Orleans, Louisiana, on 27 April 1999.

The letters of authorization specify measures that must be taken to minimize the possibility that structure removal will kill or injure dolphins. The measures have nearly eliminated the risk of dolphins being killed or injured incidental to structure removal. The Commission presumes that the companies that conduct structure removals will seek renewal of the regulations before they expire in November 2000.

Authorizations under Section 101(a)(5)(D)

Taking Incidental to Geophysical Seismic Surveys in the Alaska Beaufort Sea — On 15 April 1998 the National Marine Fisheries Service received an application from Western Geophysical/Western

Atlas International of Houston, Texas, for authorization to take small numbers of bowhead whales and other marine mammals by harassment incidental to seismic surveys in the south-central Beaufort Sea between 1 July and 20 October 1998. Notice of receipt of the application and proposed taking authorization were published on 20 May 1998.

In its 19 June 1998 comments on the application, the Commission noted that neither it nor the previous applications for authorization to take marine mammals incidental to seismic activities in the Beaufort Sea indicated how much more seismic work would be required to delineate possible oil- and gas-bearing structures in the area or the types and scale of exploration and development activities that may follow if promising structures are found. The Commission also noted that, while the Service's preliminary determination was that the seismic surveys were likely to have no more than short-term effects on behavior, the *Federal Register* notice appeared to imply that the Service believed that seismic surveys and subsequent exploration and development activities could have cumulative adverse effects. The Commission recommended that the Service, if it had not already done so, consult with the applicant, the Alaska Department of Fish and Game, and the Native communities whose hunting of marine mammals could be affected by exploration and development activities in the Beaufort Sea to determine the long-term monitoring that would be required to confirm that the planned seismic surveys and possible follow-up actions will not cause changes in the distribution, abundance, or productivity of marine mammals in the area.

On 28 May 1999 the Service published a *Federal Register* notice indicating that it had received an application from Western Geophysical requesting authorization for the harassment of small numbers of bowhead whales and other marine mammals incidental to seismic surveys to be conducted between western Camden Bay and Harrison Bay in the Alaska Beaufort Sea between 1 July and mid- to late October 1999. The notice indicated that Western Geophysical had provided, as part of its application, a monitoring plan to assess impacts to marine mammals and that this monitoring plan would be subject to peer review by technical experts before formal acceptance by the Service. The notice also indicated that the Service

had tentatively determined that the seismic surveys were likely to have negligible impacts on marine mammals and that the requested authorization was warranted.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the application and on 1 July 1999 provided comments to the Service. The Commission concurred with the Service's preliminary determination that the planned seismic surveys were likely to have no more than short-term effects on the behavior of the potentially affected marine mammals. The Commission also concurred with the preliminary determination that the monitoring and mitigation measures proposed by Western Geophysical likely would be adequate to ensure that the planned surveys do not result in the mortality or serious injury of any marine mammal or have unmitigable adverse effects on the availability of marine mammals for taking by Alaska Natives. The Commission recommended that the authorization be issued, provided that the Service was satisfied that the monitoring and mitigation programs would be carried out as described in the monitoring plan.

The Commission also concurred with the view, set forth in the application, that studies done to date in the nearshore waters of the Alaska Beaufort Sea have reasonably documented the short-term effects of seismic surveys on marine mammals and that "it would be appropriate to discuss circumstances in which project-specific measurements might no longer be needed if the results are predictable based on previous closely related projects." The Commission recommended that the peer group established to review the proposed monitoring and mitigation programs be asked to consider (1) whether continuation of marine mammal observations in association with seismic surveys in the nearshore waters of the Alaska Beaufort Sea beyond 1999 was likely to produce significant new information on either the short- or long-term effects of seismic surveys on marine mammals, and (2) whether the types of site-specific monitoring programs conducted to date have been sufficient to verify that seismic surveys and related activities do in fact have negligible population-level effects. The Commission questioned whether there was sufficient basis for concluding that the planned 1999 seismic surveys, coupled with past and

possible future surveys and subsequent development activities, would have negligible cumulative adverse effects on the potentially affected marine mammal species or their availability to Alaska Natives. The Commission recommended that the Service, if it had not already done so, assess whether the monitoring required as a condition of this and possible future incidental harassment authorizations would be adequate to detect non-negligible cumulative effects, and, if not, what more must be done to detect possible cumulative effects before they reach significant levels that could be irreversible.

On 30 July 1999 the Service published a *Federal Register* notice indicating that it had issued the requested incidental harassment authorization. Among other things, the notice referenced and described the Service's response to the comments provided by the Commission. With regard to the questions that the Commission recommended be considered by the peer review group, the Service indicated that the group had concluded that the applicant's proposed research and monitoring programs, coupled with existing bowhead whale monitoring programs, should be sufficient to detect long-term, cumulative impacts on the whales.

As noted in its previous annual report, the Commission believes that, if seismic surveys are expected to be conducted in a particular area for more than a year or if surveys are likely to lead to additional activities that could have adverse cumulative effects, incidental harassment, authorizations should be obtained under section 101(a)(5)(A) rather than section 101(a)(5)(D) of the Act. The Commission also believes that further assessment is required to ensure that ongoing and future research and monitoring programs will be adequate to detect and prevent long-term cumulative adverse effects.

Taking Incidental to Marine Hazards Investigations in Southern California — On 5 March 1999 the National Marine Fisheries Service published a *Federal Register* notice announcing receipt of a request from the U.S. Geological Survey for authorization to take small numbers of marine mammals by harassment incidental to seismic surveys planned for a two-week period between May and July 1999 to investigate (1) the hazards posed by landslides and potential earthquake faults in the nearshore marine

area from Santa Barbara to San Diego, and (2) the invasion of seawater into freshwater aquifers that are critical to the water supply for people in the Los Angeles-San Pedro area.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed and by letter of 26 April 1999 provided comments to the Service. The Commission questioned one of the assumptions used to calculate the safety zones that would be established to ensure that no marine mammals would be seriously injured incidental to the planned surveys. The Commission recommended that either a more conservative assumption be used to calculate the safety zone or that measurements be made at the beginning of the surveys to confirm that the generated sounds would be attenuated as calculated. The Commission also recommended that the U.S. Geological Survey be required to (1) report at the end of each 24-hour period the species and numbers of marine mammals observed approaching and entering the designated safety zones during the day and during the night; and (2) suspend nighttime operations if the species and number of animals observed approaching and entering the safety zones at night were significantly less than observed during the day, suggesting that nighttime observations were failing to detect many of the animals that were entering the designated safety zones.

The California Coastal Commission also considered the planned hazards survey at a public hearing on 11 May 1999. During the hearing, the applicant indicated that the survey design had been modified to avoid operating within the state three-mile limit and to expand the safety radius for odontocetes to 100 meters, the radius previously proposed for mysticetes. However, the Coastal Commission determined that, even with these modifications, the project was not consistent to the maximum practicable extent with the state's coastal management program. The Coastal Commission further determined that there were practicable measures, such as prohibiting seismic surveys at night, that could be taken to better ensure consistency with the plan.

On 28 May 1999 the Geological Survey submitted a modification of its application to the Service, reflecting the modifications suggested by the Coastal

Commission. On 3 June 1999 the Service authorized the incidental harassment.

Taking Incidental to Strengthening the Richmond-San Rafael Bridge in San Francisco Bay — In 1997 the California Department of Transportation received authorization from the National Marine Fisheries Service to take small numbers of Pacific harbor seals and California sea lions by harassment incidental to strengthening the Richmond-San Rafael bridge to better withstand earthquakes. The work was not completed in 1998, and on 9 November 1998 the Service received a request to renew the authorization. Notice of the request was published in the *Federal Register* on 16 February 1999. The Commission, in consultation with its Committee of Scientific Advisors, reviewed the request and by letter of 10 March 1999 advised the Service that it agreed that harassment of marine mammals incidental to the bridge work likely would have negligible impacts on the affected stocks and that this determination was supported by information and analyses provided in the 16 February notice.

At the end of the year, it was the Commission's understanding that the requested authorization would be issued early in 2000.

Taking Incidental to Excavating Sand at the Children's Swimming Area in La Jolla, California — On 28 December 1998 the National Marine Fisheries Service received a request from the City of San Diego for authorization to take small numbers of harbor seals, California sea lions, and northern elephant seals by harassment incidental to excavating 3,000 cubic yards of beach sand at the La Jolla Children's Pool. The pool was constructed in 1931 to provide a sheltered swimming area for children and adults. Over time, the beach behind the breakwater has gradually widened as sand has accumulated. By 1998 the beach area had advanced to near the end of the breakwater, leaving little area for recreational swimming. Further, harbor seals and occasionally

California sea lions and northern elephant seals have begun to use the beach as a haul-out area, causing fecal coliform bacteria counts to increase above state water standards for bathing beaches. As a result, the Children's Pool was determined unsafe for humans and was closed for swimming and wading in September 1997. The city proposed to restore a safe swimming area and acceptable water quality by removing sand to reduce the beach width.

Notice of the application and the Service's proposed response were published in the *Federal Register* on 22 February 1999. The Commission, in consultation with its Committee of Scientific Advisors, reviewed the request and provided comments to the Service on 24 March 1999. From the information contained in the request and the notice, the Commission concluded that the planned removal of sand likely would have no more than a temporary effect on the behavior of harbor seals, sea lions, and elephant seals that haul out in the area. The Commission also noted that there appeared to be other suitable haul-out sites in the area so that population-level effects would be negligible even if the seals and sea lions stopped hauling out on the Children's Pool beach. The Commission also pointed out that intentional harassment cannot be authorized under section 101(a)(5)(D) of the Act. Thus, the Commission advised that, if intentional harassment is necessary to cause seals or sea lions to leave the area, the Service should ensure that this intentional taking is done by a person authorized to do so under section 109(h)(1).

On 8 April 1999 the Service was notified by the City of San Diego Parks and Recreation Department that it was considering possible alternatives to sand removal to reduce the level of fecal contamination in the Children's Pool water and was withdrawing its request for an incidental harassment authorization. The letter noted that an application could be resubmitted in the future. Notice of the withdrawal was published in the *Federal Register* on 28 April 1999.

Chapter XI

MARINE MAMMALS IN CAPTIVITY

Under the Marine Mammal Protection Act, permits to take marine mammals may be issued by the Secretary of Commerce or the Secretary of the Interior, depending on the species of marine mammal involved, for several purposes, including public display, scientific research, or enhancing the survival or recovery of a species or stock. Such permits may, among other things, authorize the maintenance of marine mammals in captivity. Under the Animal Welfare Act, the Animal and Plant Health Inspection Service of the Department of Agriculture has responsibility for ensuring that facilities for maintaining marine mammals are adequate. Since its inception, the Marine Mammal Commission has worked with the Service to ensure the safety and well-being of marine mammals in captivity.

Amendments to the Marine Mammal Protection Act enacted in 1994 limited the authority of the National Marine Fisheries Service and the Fish and Wildlife Service over marine mammals once they are removed from the wild and placed in captivity. Although no corresponding amendments to the Animal Welfare Act were enacted, the practical effect was to place greater emphasis on the role of the Animal and Plant Health Inspection Service in matters concerning the care and maintenance of captive marine mammals. Among other things, the Animal and Plant Health Inspection Service assumed sole responsibility for regulating programs that allow humans to interact with captive marine mammals, such as swim-with-the-dolphin programs.

Care and Maintenance Standards

The Animal and Plant Health Inspection Service regulates the humane handling, housing, care, treatment, and transportation of marine mammals and other warm-blooded animals under the Animal Welfare Act. The Service originally adopted standards

applicable to marine mammals in 1979 and incorporated amendments in 1984. The standards have not been updated since then to reflect advances in animal husbandry and marine mammal science.

As discussed in previous annual reports, in 1990 the Marine Mammal Commission urged the Animal and Plant Health Inspection Service, along with the National Marine Fisheries Service and the Fish and Wildlife Service, to consider a joint review to revise the 1984 standards. As a first step, in July 1991 the Commission provided the Animal and Plant Health Inspection Service with a comprehensive discussion paper, identifying shortcomings in the standards and raising questions that the Commission thought needed to be addressed as part of the review.

The Animal and Plant Health Inspection Service subsequently indicated its intention to use negotiated rulemaking to review and revise its marine mammal standards and guidelines. A negotiated rulemaking committee composed of representatives of the public display and animal welfare communities and government agencies was formed by the Service in 1995. The Commission, the National Marine Fisheries Service, and the Fish and Wildlife Service participated as non-voting observers.

The negotiated rulemaking committee met three times between September 1995 and July 1996 and developed consensus language for a proposed rule to be published by the Animal and Plant Health Inspection Service to revise certain sections of the standards. The committee reached agreement on sections addressing the following: feeding; sanitation; employees and attendants; transportation; veterinary care; general facility systems, such as water and power supplies and waste disposal; paragraph (a) of space requirements; and separation of animals. Consensus was not reached on the sections that address the most contentious and potentially costly issues, including special

considerations regarding compliance and variances; indoor facilities (which includes provisions on ambient temperatures, ventilation, and lighting); outdoor facilities (which includes temperature and shelter requirements); space; and water quality. Voting members of the rulemaking committee were not allowed to comment negatively or in opposition to any of the consensus language at the proposed rule stage. Observers such as the Marine Mammal Commission, however, were not similarly constrained.

After considering projected costs for additional negotiating sessions and the likelihood of the committee reaching consensus on the remaining issues, the Animal and Plant Health Inspection Service decided to hold no further negotiating meetings and to develop remaining sections of the proposed rule itself.

In December 1997 the Commission wrote to the Service noting that during the negotiating sessions, consensus had been reached on several sections of the proposed rule and that the proposed rule was to have been published during the first half of 1997. The Commission asked the Service to advise it as to what work remained to be done and what clearances needed to be obtained before publication. The Service's response indicated that it had decided to bifurcate the rulemaking process and address those portions of the proposed regulations not based on the agreement of the negotiated rulemaking committee separately.

Proposed regulations based on the consensus language were published in the *Federal Register* on 23 February 1999. A final rule is currently undergoing clearance within the Department of Agriculture and the Office of Management and Budget. It is expected to be published early in 2000. The Service is now focusing on development of a proposed rule for the non-consensus sections of the marine mammal care and maintenance regulations under the Animal Welfare Act. Expected publication of this proposed rule is mid-2000.

Swim-with-the-Dolphin Regulations

In a separate rulemaking initiated in 1995, the Animal and Plant Health Inspection Service proposed

to regulate swim-with-the-dolphin programs, which, prior to the 1994 amendments, had been regulated by the National Marine Fisheries Service. As discussed in previous annual reports, the Commission commented in March 1995 recommending, among other things, that the Animal and Plant Health Inspection Service conduct on-site inspections of current and proposed facilities; clarify its authority to suspend a swim program's authorization if the facility is found to be deficient or is not adhering to the applicable regulations; and clarify what constitutes adequate training for dolphins in swim programs. On 4 September 1998 the Service published a final rule establishing standards for swim-with-the-dolphin programs. The rule, which became effective in October 1998, included standards for the humane handling, care, and treatment of cetaceans used in swim programs. It also established requirements on the size of enclosures in which swim programs could be conducted, veterinary care programs, personnel qualifications, the handling of animals, and recordkeeping. The Service did not adopt the Commission's recommendations.

Through its definition of "swim programs," the Service's regulations covered all programs in which humans enter the water to interact with cetaceans, including "wading programs." Wading programs were defined as programs in which human participants interact with dolphins while remaining stationary and non-buoyant. In response to complaints by facilities subject to the regulations solely because they offered wading programs, the Service on 14 October 1998 published a *Federal Register* notice announcing that, until further notice, it would not apply those provisions of the swim regulations pertaining to participant/attendant ratios and space requirements for the interactive areas to these facilities, but would examine these matters separately. On 2 April 1999 the Service published a notice in the *Federal Register* seeking public comment on such programs.

As discussed in Chapter II, on 29 June 1999 the Commission appeared before the House Subcommittee on Fisheries Conservation, Wildlife, and Oceans to present testimony on issues relative to reauthorization of the Marine Mammal Protection Act. In its statement, the Commission noted that the Animal and Plant Health Inspection Service has not moved very quickly to fill the void left by nullification of the

National Marine Fisheries Service's policies regarding captive marine mammals. The Commission noted, for example, that it had taken the Animal and Plant Health Inspection Service more than four years to replace the National Marine Fisheries Service's regulations that had governed swim-with-the-dolphin programs prior to the 1994 amendments. And then, as noted above, early in 1999 these regulations were in part suspended. In its statement to the subcommittee, the Commission noted the need for the Service to speed up issuance of specific regulations to resolve issues concerning swim and wading programs.

At the end of 1999 it was the Commission's understanding that the Service intended to publish proposed amendments to the current swim regulations along with the non-consensus portion of the marine mammal care and maintenance standards in mid-2000.

Exports of Marine Mammals to Foreign Facilities

Section 102(a)(4) of the Marine Mammal Protection Act, as amended in 1994, prohibits the export of marine mammals taken in violation of the Act or for any purpose other than public display, scientific research, or species enhancement. Marine mammals may be exported from U.S. facilities as long as the receiving facility meets requirements comparable to those applicable to U.S. facilities.

Before obtaining marine mammals from the United States for public display, a foreign facility must provide documentation to the National Marine Fisheries Service demonstrating that it meets comparable standards with respect to education or conservation programs and public accessibility. The facility must also provide documentation to the Animal and Plant Health Inspection Service demonstrating that it meets standards for care and maintenance of the marine mammals comparable to those applicable to U.S. facilities under the Animal Welfare Act. The Animal and Plant Health Inspection Service evaluates the documentation and provides the results to the National Marine Fisheries Service or the Fish and Wildlife Service, as appropriate. 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 adequate care of marine mammals transferred to foreign facilities can be assured. Should a foreign facility not meet the comparability requirements, the National Marine Fisheries Service and the Fish and Wildlife Service are required to block the export of species under their jurisdiction.

Some disagreement exists among the responsible agencies and the public display industry as to how such comparability findings are to be made and for what period the facility must remain comparable. The National Marine Fisheries Service believes that its responsibilities under the Marine Mammal Protection Act, and those of the receiving facility, do not end once an animal has been exported. It therefore requires the foreign government with jurisdiction over the facility to certify the accuracy of information submitted by the facility and to afford comity (*i.e.*, agree to recognize and facilitate enforcement of Service actions concerning the animals) to actions the Service may take to enforce the comparability provisions of the Act once animals are exported. The public display industry believes that there is no continuing U.S. jurisdiction after an animal is exported (*i.e.*, comparability requirements apply only at the time of export and a comity statement is not required).

As discussed in previous annual reports, the Animal and Plant Health Inspection Service in 1994 requested the Commission's comments on a document outlining the information required from a foreign facility to enable the Service to determine that comparable standards have been met. The Commission responded on 8 September 1994, noting that the only reliable way to ascertain whether a foreign facility meets the comparability requirements is to conduct an on-site inspection, as is done for U.S. facilities.

During 1995 the National Marine Fisheries Service requested the Commission's comments on four applications from foreign facilities requesting authorization to export unreleasable stranded marine mammals from the United States for purposes of public display. The Commission reiterated comments from its 8 September 1994 letter that an on-site inspection by a qualified individual (*e.g.*, an Animal and Plant Health Inspection Service inspector or an independent inspec-

tor approved by the Animal and Plant Health Inspection Service who is familiar with marine mammals) is the only reliable way to ensure that a facility meets standards comparable to those applicable in the United States. The Commission noted that, although the Animal and Plant Health Inspection Service does not have authority under the Animal Welfare Act to compel a foreign facility to consent to an inspection, it is within the authority of the National Marine Fisheries Service and the Animal and Plant Health Inspection Service to require a foreign facility to allow and pay for such an inspection as a condition of obtaining animals from the United States. Thus, inspection could be made mandatory. The Commission further noted that it would not be difficult to imagine circumstances in which it would be better to euthanize an animal than to transfer it to a foreign facility that was ill-equipped to maintain it.

After its November 1996 annual meeting, the Commission again wrote to the Animal and Plant Health Inspection Service about the export of marine mammals from the United States. The Commission noted that the Service was continuing to base comparability determinations solely on written submissions and reiterated its views that a foreign facility could and should be required to accept and pay for an inspection as a condition of obtaining marine mammals from the United States.

The Animal and Plant Health Inspection Service responded to the Commission on 8 January 1997. The Service stated that, although it does not have authority under the Animal Welfare Act to inspect facilities outside the United States and its territories officially, it would be willing to consider sending inspectors to foreign facilities for purposes of determining comparability with Animal Welfare Act standards if it were invited to do so by the foreign government and if the expenses associated with the inspection were covered. The Service noted that, if a deficiency is found, it does not have authority to compel correction. The Service also questioned the need for on-site inspections of foreign facilities because it was unaware of any problems associated with the care of marine mammals exported in the past.

The Commission also wrote to the National Marine Fisheries Service after its 1996 annual meeting about the export of marine mammals. The Commission noted that, in light of the provisions of section 104 of the Marine Mammal Protection Act, the Service has little choice but to require a comity statement or to implement some other mechanism to ensure continuing jurisdiction over foreign facilities that receive marine mammals from the United States. Nevertheless, the Commission noted that, given existing funding, it is unrealistic to assume that the National Marine Fisheries Service will be able to adequately monitor compliance by foreign facilities or take remedial actions if problems are detected. The Commission therefore suggested that it might make sense if the Marine Mammal Protection Act were amended to eliminate continuing jurisdiction over marine mammals once they are exported but to strengthen the mechanisms for ensuring comparability before authorizing an export.

The National Marine Fisheries Service responded to the Commission on 19 August 1997. The Service provided strong support for requiring on-site inspections of foreign facilities and agreed that the issue might best be addressed through amendment of the Animal Welfare Act or the Marine Mammal Protection Act. Until this occurs, however, the Service noted that requiring a comity statement and a certification of accuracy from the foreign government, combined with a comparability recommendation from the Animal and Plant Health Inspection Service, remained reasonable requirements consistent with the export provisions of the Marine Mammal Protection Act.

In its 29 June 1999 testimony before the House Subcommittee on Fisheries Conservation, Wildlife, and Oceans, the Commission recommended two ways in which marine mammal export provisions might be improved. Under the first alternative, as a trade-off to yielding jurisdiction over a marine mammal once it has been exported, the United States should strengthen the reliability of its comparability determination by requiring a physical inspection of the facility prior to approving an export. Under the second alternative, the United States would not look at the adequacy of a receiving facility at all, but rather would restrict exports of marine mammals to those countries that have demonstrated that they have in place a program

overseeing the welfare of captive marine mammals comparable to that established by the United States under the Animal Welfare Act. Therefore, a country would need to demonstrate that it has adopted minimum requirements for facility construction and other aspects of care and maintenance, that those requirements are enforced through periodic inspections, and that it has in place an effective means of preventing exports of marine mammals to facilities in other countries that do not meet certain minimum standards.

The National Marine Fisheries Service is working on a proposed rule regarding public display permits, including transfer/transport requirements, to cover both foreign and domestic facilities. The Service intends to publish the proposed rule in March 2000. This is discussed in more detail in Chapter X.

Release of Captive Marine Mammals to the Wild

Over the past few years, there has been increased debate over the appropriateness of returning long-term captive marine mammals to the wild. Whether such releases are in the best interests of the animal is questionable, and the procedures for preparing animals for release are still experimental. In addition, such releases could incidentally introduce diseases into wild populations. It is generally thought that release of long-term captive animals should be pursued only with adequate monitoring and in accordance with an appropriate research protocol, pursuant to a scientific research permit.

The Commission on 30 November 1994 wrote to the National Marine Fisheries Service, recommending that the Service refrain from considering any permit application seeking authority to release marine mammals to the wild until objective, generally accepted criteria had been developed for judging when release is appropriate. The Commission reiterated this recommendation in a letter to the Service on 6 December 1996. The Commission further recommended that the Service publish an unequivocal policy statement or, if necessary, regulations specifying that the release of captive marine mammals to the wild without proper authorization has the potential to injure marine mammals and is considered an illegal taking.

The Commission further recommended that, if the Service does not believe it has sufficient authority to prevent unauthorized releases, it seek amendment of the Marine Mammal Protection Act to obtain such authority.

As discussed in previous annual reports, one effort to release long-term captive marine mammals involved bottlenose dolphins maintained at a facility in Florida. The facility, which acquired the dolphins in 1994 under a public display permit, initially intended to seek a scientific research permit under which preparation for release, release, and post-release monitoring would occur. Instead of submitting an application, however, the facility operators decided to transport two of the dolphins to waters off Key West and release them without authorization. This was done despite warnings from the National Marine Fisheries Service that such action would constitute a violation of the Marine Mammal Protection Act. The facility contended that, because of the 1994 amendment that limited the National Marine Fisheries Service's authority over captive marine mammals, this did not constitute a violation of the Act.

Without sufficient preparation for the release, one of the dolphins appeared at a Key West marina after having sustained lacerations, begging for food. The second dolphin also sustained deep lacerations and, when recaptured several days later, was emaciated. The animals likely would have died, had they not been rescued by the National Marine Fisheries Service. As demonstrated by this experience, releasing marine mammals before they are properly prepared has the potential to injure the released animals. It also exposes the released and wild marine mammals to the risk of contracting diseases. Therefore, the Commission believes the unauthorized release of captive marine mammals has the potential to injure marine mammals and constitutes a form of taking as defined under the 1994 amendments to the Marine Mammal Protection Act.

The National Marine Fisheries Service and the Animal and Plant Health Inspection Service have both pursued enforcement actions against the facility. The Animal and Plant Health Inspection Service suspended the facility's Animal Welfare Act license, which provided a partial basis for the National Marine

Fisheries Service to seize a third dolphin maintained at the facility. The Animal and Plant Health Inspection Service concluded its enforcement action in 1996 by imposing a \$10,000 fine. The fine was suspended, however, when the licensee agreed to surrender its license voluntarily and cease participating in regulated activities. In 1998 the National Marine Fisheries Service brought charges against four individuals involved in the unauthorized release, alleging an illegal take by harassment and illegal transportation of each dolphin. The case was heard by an administrative law judge in February 1999 and resulted in the individuals and their respective corporate entities being ordered to pay civil penalties totaling \$59,500. This sum includes the maximum penalty of \$40,000 for illegally "taking" by harassment and illegally transporting each of the dolphins. The facility was fined an additional \$19,500 for failing to notify the Service prior to the transport of the dolphins.

On 6 December 1996, following the unauthorized release of the two dolphins, the Commission wrote the Animal and Plant Health Inspection Service regarding the issue generally. The Commission noted that Animal Welfare Act regulations require that facilities maintaining marine mammals be structurally sound and in good repair to protect and constrain the animals and to restrict entry of unwanted animals. The Commission noted that despite the clear requirement that marine mammals be contained in an enclosure, some facilities have been allowed to permit animals to venture outside the primary enclosure. Although this may be appropriate in certain situations (*e.g.*, open-water training of marine mammals by the Navy), such exceptions should be authorized only if necessary and only if safeguards are in place to ensure that the animals will be returned to their primary enclosure. The Commission recommended that the Animal and Plant Health Inspection Service work with the National Marine Fisheries Service and the Fish and Wildlife Service to review their respective authorities and consider the need for more decisive enforcement of existing statutory provisions and regulations, issuance of policy statements, and regulatory amendments. If the agencies determine that they have authority to respond to, but not prevent, unauthorized releases, the Commission recommended that the agencies seek statutory authority to do so.

In its 29 June 1999 testimony to the Subcommittee on Fisheries Conservation, Wildlife, and Oceans, the Commission recommended that the provisions of the Act be strengthened by specifically prohibiting the release of captive marine mammals, other than those being maintained under the stranding and rehabilitation program, without specific authorization. The Commission also noted the desirability of providing the National Marine Fisheries Service, the Fish and Wildlife Service, and/or the Animal and Plant Health Inspection Service with explicit authority to seek injunctive relief to prevent anticipated violations of the Animal Welfare Act or the Marine Mammal Protection Act when such violations pose risks to the welfare of the animals, the public, or wild marine mammal populations.

Another marine mammal being considered for possible release to the wild is Keiko, the killer whale featured in the movie *Free Willy*. Keiko, captured off Iceland in 1979 at the age of two, lived in an Icelandic aquarium for three years before being moved to a facility in Ontario, Canada. In 1985 the animal was sold to a facility in Mexico City. After nearly 20 years in captivity, in 1996 the animal was moved to the Oregon Coast Aquarium where the Free Willy/Keiko Foundation undertook to improve his health. In September 1998 Keiko was returned to Iceland for further rehabilitation and possible release to the wild.

Both before and after Keiko's export, the National Marine Fisheries Service made it clear to the Free Willy/Keiko Foundation that it must apply for a scientific research permit if release of Keiko to the wild is deemed a desirable option. In this regard, the Service has advised the Foundation and the Icelandic government of the need to develop a sound scientific approach to any release that may be considered, comparable with what would be required for a scientific research permit under the Marine Mammal Protection Act. To date, the Ocean Futures Society, the successor to the Foundation, has chosen to hold Keiko for public display purposes while continuing to evaluate future release possibilities. Information provided by the Society indicates that it is preparing a draft scientific protocol for review by the National Marine Fisheries Service and the Commission that would govern the release of Keiko.

APPENDIX A

MARINE MAMMAL COMMISSION RECOMMENDATIONS IN 1999

- 8 January Commerce, commenting to the National Marine Fisheries Service on a 16-17 December 1998 meeting to review the research program under the International Dolphin Conservation Program Act; commending the Service on the expertise of staff assigned to conduct and analyze results of research mandated by the Act; noting that requirements of the Marine Mammal Protection Act prevented Commission participants from making formal recommendations at the meeting; emphasizing the need to determine a value for the estimated maximum growth rate for dolphin populations; dismissing the need for a more detailed review of the legislative intent behind the term "significant adverse impact"; urging the Service to consider how the decision analysis framework will be published; concurring with the preliminary decision to include coastal spotted dolphins in Secretarial determinations; recommending that the Service obtain and review information concerning the frequency with which sets are made on spotted dolphins and numbers chased and encircled relative to stock size; recommending that the review of stress-related literature be made available for public comment; urging the completion of protocols for the mandated necropsy study; recommending that, if it has not already done so, the Service inform Congress of its apparent deviation from legislative directives with regard to necropsy research; commending the innovative nature of the various research proposals; and recommending that the Service provide a status report to Congress on International Dolphin Conservation Program Act research.
- 14 January Commerce, scientific research permit, Ronald J. Schusterman.
- 14 January Commerce, scientific research permit, Charles A. Mayo, III.
- 14 January Commerce, scientific research permit, Marcia L. Green.
- 22 January Commerce, commenting to the National Marine Fisheries Service on its notice of intent to conduct a status review of Cook Inlet beluga whales; supporting the proposal to initiate the status review; urging that ongoing efforts to conclude a co-management agreement with Alaska Native organizations be continued and that alternatives to the current co-management approach be pursued; recommending that the Service take emergency action to list the Cook Inlet stock of beluga whales as endangered or threatened under the Endangered Species Act and also pursue listing under normal procedures; recommending that the Service initiate a rulemaking to limit the allowable take from the Cook Inlet beluga population; further recommending that it explore the possibility of amending the Marine Mammal Protection Act to limit allowable take; and finally recommending that it initiate rulemaking to establish a marking, tagging, and reporting program for Cook Inlet belugas taken for subsistence purposes by Alaska Natives.
- 25 January State, commenting to the senior U.S. Arctic official on the meeting of the Working Group on the Arctic Monitoring and Assessment Program; noting that a copy of the report submitted by a Commission contractor had been forwarded to the State Department; concurring with the conclusions drawn in the report; adding that initiatives introduced to coordinate activities between various working groups of the Arctic Council should be continued; noting the desirability of developing an inventory of Arctic Council-related projects; suggesting that discussions be pursued concerning access to proprietary data for working group members; and concurring that efforts to clarify relationships between the working groups, the Arctic

Council, and senior Arctic officials should be pursued.

- 26 January Commerce, amendment of scientific research permit, Bruce R. Mate.
- 26 January Commerce, commenting to the Office of Global Programs on the Working Group on the Arctic Monitoring and Assessment Program meeting; transmitting the Commission contract report and noting that climate change may be adversely affecting marine mammals through changes in ice cover or other critical habitat components; noting also that Native communities in the Arctic depend on marine mammals for food; and requesting a meeting to discuss these issues.
- 4 February Commerce, amendment of scientific research permit, R. Michael Laurs, Southwest Fisheries Science Center.
- 4 February Commerce, amendment of scientific research permit, Douglas P. DeMaster, National Marine Mammal Laboratory.
- 4 February Commerce, amendment of scientific research permit, Douglas P. DeMaster, National Marine Mammal Laboratory.
- 4 February Commerce, amendment of scientific research permit, Rennie S. Holt, Southwest Fisheries Science Center.
- 12 February Interior, public display permit, Sammye Seawell, Anchorage Zoo.
- 12 February Commerce, commenting to the Southwest Fisheries Science Center on four documents related to research programs under the International Dolphin Conservation Program Act; noting that they were well written and appropriately focused; and providing specific comments and suggestions for each.
- 10 March Commerce, amendment of scientific research permit, Michael P. Sissenwine, Northeast Fisheries Science Center.
- 11 March Commerce, amendment of scientific research permit, D. Ann Pabst.
- 11 March Commerce, amendment of scientific research permit, William G. Gilmartin, Hawai'i Wildlife Fund.
- 23 March Commerce, scientific research permit, Craig O. Matkin, North Gulf Oceanic Society.
- 24 March Commerce, commenting to the National Marine Fisheries Service on the request from the City of San Diego Parks and Recreation Department for authorization to take by harassment small numbers of Pacific harbor seals, California sea lions, and northern elephant seals incidental to excavating and removing sand at the La Jolla Children's Pool; recommending that observers monitor the site to ensure the animals have cleared the area before work begins each day and are not present while work is being done; noting that the work needs to be completed as scheduled to avoid the peak pup occupation in June; and recommending that the applicant be advised that no intentional hazing is permissible.
- 25 March Commerce, scientific research permit, Paul J. Ponganis.
- 31 March Commerce, commenting to the National Marine Fisheries Service on its notice and the related petition from British Petroleum Exploration (Alaska) Inc., seeking promulgation of regulations

to authorize the taking of small numbers of bowhead whales, gray whales, beluga whales, ringed seals, bearded seals, and spotted seals incidental to construction and operation of the Northstar and Liberty oil and gas production facilities in the Beaufort Sea; recommending that the National Marine Fisheries Service initiate the rulemaking as requested, provided it is satisfied that the planned marine mammal and related monitoring programs will be adequate to verify how and at what distances marine mammals may be affected, that only small numbers of marine mammals are taken, and that the cumulative impacts on the affected species and stocks are negligible; further recommending that the Service specify in the regulations that proposed monitoring plans and the results of the programs be reviewed annually by the Service and outside experts to confirm that the programs are capable of detecting any non-negligible, cumulative, population-level effects and that the requirements be revised as necessary; also recommending that the Service consult with the Fish and Wildlife Service to determine and cooperatively specify monitoring requirements for polar bears and ringed seals; noting that aerial surveys may not be sufficient to effectively locate ringed seal lairs; suggesting that alternative methods to aerial surveys be considered; and noting that intentional hazing to keep seals and whales away from oil spills cannot be authorized under section 101(a)(5)(A) of the Marine Mammal Protection Act.

- 1 April Interior, commenting to the Truckee-Carson Coordination Office on the Draft Evaluation of the Southern Sea Otter Translocation Program and the Draft Memorandum concerning Re-initiation of Formal Consultation on the Containment Program for the Southern Sea Otter; stating that the two draft documents together are not sufficient to justify abandonment of the translocation or zonal management programs; urging the Fish and Wildlife Service to provide better explanations as to why the reasons for emigration or mortality cannot be identified and remedied; noting that the two draft documents do not indicate what is being done to resolve uncertainties concerning the causes of the apparent population decline and the movement of otters from the parent population into the management zone south of Point Conception; noting further that the drafts do not provide assessments of the likely success of steps being taken to reduce the risk and impacts of oil spills or the possible effects of the proposed actions on commercial and recreational finfish and shellfish fisheries; and providing specific comments on both drafts.
- 6 April Commerce, scientific research permit, Dennis Orthmeyer, U.S. Geological Survey.
- 7 April Commerce, amendment of scientific research permit, Douglas P. DeMaster, National Marine Mammal Laboratory.
- 9 April Interior, commenting to the Fish and Wildlife Service on the composition of the Florida Manatee Recovery Team; supporting efforts by the Service to reestablish the team; and recommending that two representatives from the environmental community and a representative of the Manatee Technical Advisory Council be added to the team before its next meeting.
- 12 April Commerce, scientific research permit, Christine M. Gabriele, Glacier Bay National Park and Preserve.
- 14 April Commerce, amendment of scientific research permit, Michael Castellini, Alaska Sealife Center.
- 14 April Commerce, amendment of scientific research permit, David K. Matilla, Center for Coastal Studies.
- 14 April Commerce, scientific research permit, Dennis Orthmeyer, U.S. Geological Survey.

- 16 April Interior, commenting to the Fish and Wildlife Service on its efforts to increase and reorganize support for enforcement of manatee-related regulations; commending the Service for its attention in this regard; and urging that changes not be made to the current law enforcement staffing.
- 22 April Commerce, scientific research permit, Teri Rowles, Marine Mammal Health and Stranding Response Program.
- 26 April Commerce, commenting to the National Marine Fisheries Service on the notice regarding the request of the U.S. Geological Survey for an incidental harassment authorization to take small numbers of marine mammals in the course of seismic surveys off southern California; requesting that the Service provide the rationale for the determination that sound level exposures of 180 dB and 190 dB will not adversely affect the hearing of cetaceans and pinnipeds; recommending that a more conservative estimate of the attenuation rate be used to calculate proposed safety zones or that measurements be made at the beginning of the survey to confirm the appropriateness of the chosen $25\log(R)$ rate within horizontal distances less than the depth of the water column; also recommending that the Service consult with the applicant to better determine the rationale for using two observers, and, if necessary, require additional observers or changes in the observation protocol to ensure that any taking of marine mammals is by Level B harassment only; and recommending that the applicant be required to (1) report at the end of each 24-hour period the species and numbers of marine mammals observed approaching and entering the designated safety zones during the day and night, and (2) suspend nighttime operations if the species and number of animals observed approaching and entering the safety zones at night are significantly less than observed during the day.
- 13 May Commerce, commenting to the National Marine Fisheries Service on interactions between Hawaiian monk seals and commercial lobster fishing; urging the Service to provide adequate funding for studies to resolve key questions about the importance of lobsters in monk seal diets, and to preclude lobster fishing at French Frigate Shoals until such studies have been carried out; requesting that the Service review and respond to previous Commission requests and recommendations in this regard; and repeating a past recommendation that the Service take the necessary steps to organize and carry out the clean-up of the 1998 lobster fishing vessel wreck.
- 13 May Western Pacific Regional Fishery Management Council, commenting to the Council on previous recommendations to address potential interactions between Hawaiian monk seals and commercial lobster fisheries; responding to points raised regarding the effects of lobster fishing on Hawaiian monk seals; and urging the Council to (1) support studies by the National Marine Fisheries Service to determine (a) the prey species eaten by different age/sex classes of monk seals, (b) the locations of key foraging areas for juvenile monk seals and nursing females at French Frigate Shoals and Pearl and Hermes Reef, and (c) the abundance of lobsters and other prey species in these key foraging areas, and (2) prohibit lobster fishing at atolls supporting major monk seal colonies until results of the recommended studies are available and sufficient to conclude that lobster fishing will not impede monk seal population recovery.
- 17 May Commerce, commenting to the National Marine Fisheries Service on the implementation of programs under the Marine Mammal Health and Stranding Response Act; noting that the Service has made substantial progress in implementing the mandated programs but that some efforts have been hampered by limited funding; concurring with the recommendation from the Chairman of the Marine Mammal Unusual Mortality Event Working Group that the Service seek increases in its authorization levels and request in full the authorized amounts for the programs referenced in sections 402 and 407 of the Act; recommending that the requested

funding be used to add at least one veterinarian or biologist and a full-time data manager to the staff of the Marine Mammal Stranding Response Coordinator in the Office of Protected Resources; suggesting that the Service consult with the appropriate Congressional committees to resolve uncertainties concerning the purpose of and means for using voluntary contributions to the Marine Mammal Unusual Mortality Event Fund to pay for the care and maintenance of animals seized by the government because the facilities in which they were being held failed to meet applicable standards; and recommending that the Service immediately either designate a qualified staff member or contract with a qualified individual or organization to begin identifying private sector donors and soliciting contributions to the Fund.

- 17 May Commerce, commenting to the National Marine Fisheries Service on the urgent need to address harbor porpoise stranding events along the Atlantic coast through the Working Group on Unusual Marine Mammal Mortality Events; recommending that (1) the Working Group be asked immediately for advice on determining the magnitude and cause of the event and steps that should be taken to minimize its effects, (2) if deemed an unusual mortality event, an appropriately qualified individual be designated to coordinate the response, and (3) necessary resources be made available to said coordinator to ensure an appropriate response; and requesting that the Service provide information on all steps being taken to investigate the stranding event.
- 27 May Interior, scientific research permit, Hubbs-Sea World Research Institute.
- 27 May State of Hawaii, commenting to the Department of Land and Natural Resources on the effects of lobster fishing on Hawaiian monk seals around French Frigate Shoals; requesting that the State consider exercising its authority over fishery resources by taking the precautionary measure of prohibiting lobster fishing in state waters around major monk seal colonies at Kure Atoll, Pearl and Hermes Reef, Lisianski Island, and French Frigate Shoals, pending the results of research on monk seal diets and the effects of commercial fisheries at those sites.
- 8 June Commerce, commenting to the National Marine Fisheries Service on the Draft Environmental Assessment of the Proposed Rule to Implement the International Dolphin Conservation Program Act; noting that the draft generally succeeds in identifying alternatives and discussing possible environmental impacts resulting from the implementation of the Act; also noting that some of the analyses are directed at issues that are addressed specifically by statute and over which the Service has no discretion; further noting that section 303(b) of the Marine Mammal Protection Act requires the implementing of regulations to be developed in consultation with the Marine Mammal Commission, the Department of State, and the Inter-American Tropical Tuna Commission; requesting that the Service therefore inform the Marine Mammal Commission of its plans for conducting the consultations; and providing specific comments on the assessment.
- 9 June Commerce, scientific research permit, Brent Stewart, Hubbs-Sea World Research Institute.
- 22 June Commerce, amendment of scientific research permit, James T. Harvey, Moss Marine Landing.
- 28 June Transportation, commenting to the U.S. Coast Guard on the interim rules for mandatory ship reporting systems; and commending the Coast Guard for its cooperative efforts to develop and support the reporting systems as a tool in the conservation effort of the endangered northern right whale.
- 28 June Commerce, scientific research permit, Douglas P. DeMaster, National Marine Mammal Laboratory.

- 28 June Commerce, scientific research permit, Robin W. Baird.
- 28 June Commerce, scientific research permit, John Calambokidis, Cascadia Research Collective.
- 30 June Commerce, commenting to the National Marine Fisheries Service on its actions with regard to the lobster fishery and Hawaiian monk seals in the Northwestern Hawaiian Islands; noting that the Service had not adopted or responded to the Commission's recommendation to prohibit lobster fishing at banks used by major monk seal breeding colonies; also noting that the Service has exceeded the 120-day limit allowable under the Marine Mammal Protection Act for providing the Commission explanations as to why its recommendations have not been adopted; recommending that, for the 1999 fishing season, the Service adopt a zero quota for lobster harvest at any Northwestern Hawaiian Island banks other than Maro Reef, Gardner Pinnacles and Necker Island; and further recommending that any action on the proposed rule be deferred pending the completion and review of consultation under section 7 of the Endangered Species Act on the effects of the new quota system and the resulting redistribution of fishing effort on Hawaiian monk seals and their critical habitat.
- 1 July Commerce, commenting to the National Marine Fisheries Service on the request by Western Geophysical for an incidental harassment authorization to allow the incidental take of whales and seals during an open-water seismic program in the Beaufort Sea and the Service's *Federal Register* notice proposing to issue the authorization; concurring with the Service's preliminary determination that the planned seismic surveys are likely to have no more than short-term effects on the behavior of certain cetaceans and pinnipeds; also concurring that the monitoring and mitigation measures proposed by the applicant appear adequate to ensure that the planned surveys will not result in the mortality or serious injury of any marine mammal or have unmitigable adverse effects on the availability of marine mammals for taking by Alaska Natives for subsistence uses; recommending that the requested incidental harassment authorization be issued, provided the Service is satisfied that the monitoring and mitigation programs will be carried out as described in the application; concurring that studies done to date in the nearshore waters of the Alaska Beaufort Sea have reasonably documented the short-term effects of seismic surveys on marine mammals; recommending that the peer review group established to review the proposed monitoring and mitigation programs be asked to consider (1) whether continuation of marine mammal observations in association with seismic surveys in this region beyond 1999 is likely to produce significant new information, (2) whether the types of site-specific monitoring programs conducted to date are sufficient to verify that seismic surveys and related activities have negligible effects on the distribution, size, and productivity of the potentially affected species and populations, and (3) if necessary, how to revise the current monitoring requirements to better meet the intent and provisions of the Marine Mammal Protection Act; noting that the application is for a one-year incidental harassment authorization and that the activity for which the authorization is requested is part of an effort likely to continue and lead to drilling and other activities related to gas and oil exploration and production; recommending that the Service, if it has not already done so, assess whether the required monitoring will be adequate to detect possible non-negligible cumulative effects and, if not, to determine what must be done to ensure that such effects will be detected before they reach a significant level; and finally requesting that the Service advise the Commission if it believes it does not have the authority to require the kinds of monitoring programs necessary to detect possible adverse cumulative population-level effects.
- 8 July Commerce, amendment of scientific research permit, Kimberlee Beckmen.
- 8 July State, transmitting to the Bureau of Oceans and International Environmental and Scientific Affairs a contractor's report on the 3-6 May 1999 meetings of the Arctic Council's Sustainable Development Working Group and senior Arctic officials; and recommending that

consideration be given to proposing that reports of such meetings be drafted and approved as a closing item of each meeting.

- 8 July Commerce, photography permit, Julian Hector, British Broadcasting Corporation.
- 16 July Transportation, commenting to the U.S. Coast Guard on past recommendations regarding conservation needs related to the handling of garbage by mariners, compliance with boat speed rules to protect Florida manatees, and actions to avoid vessel collisions and disturbance of right whales along the U.S. East Coast; commending the Coast Guard for its accomplishments in each of these areas; requesting that the Coast Guard continue public outreach efforts through its Sea Partners Program on regulations to prohibit disposal of garbage from ships, protect manatees and right whales, and prohibit the feeding of wild marine mammals, especially dolphins.
- 16 July Commerce, commenting to the National Oceanic and Atmospheric Administration on the Workshop on the Effects of Persistent Ocean Contaminants on Marine Mammals; transmitting copies of the workshop report; recommending that the Administration constitute an interagency working group to (1) discuss and agree on priorities for research, monitoring, and regulatory programs, (2) review the research and monitoring programs currently being conducted and planned by the agencies, (3) identify international organizations with related research and management responsibilities, (4) develop proposals for cooperative domestic budget initiatives to better meet priority needs, and (5) meet periodically to review progress and determine future actions; and recommending that the working group include representatives from the National Marine Fisheries Service, National Ocean Service, Environmental Protection Agency, Fish and Wildlife Service, Biological Resources Division of the U.S. Geological Survey, Minerals Management Service, National Science Foundation, and the Marine Mammal Commission.
- 23 July Commerce, commenting to the National Marine Fisheries Service on the draft report from the status review of the Cook Inlet stock of beluga whales and responding to the Service's request for consultation concerning a Marine Mammal Protection Act status determination for the stock; recommending that the Service promptly complete and publish either a proposed rule under the Marine Mammal Protection Act designating the Cook Inlet beluga whale population as depleted or a proposed rule under the Endangered Species Act to list the population as threatened or endangered; urging the Service to complete a thorough analysis of the risk of extinction faced by Cook Inlet beluga whales; and further urging the Service to determine a long-term solution to the overharvesting problem addressed through 1 October 2000 by a statutory provision.
- 26 July Commerce, amendment of scientific research permit, Scott D. Kraus, Edgerton Research Laboratory, New England Aquarium.
- 26 July Commerce, scientific research permit, James H. W. Hain.
- 30 July Commerce, amendment of scientific research permit, Paul J. Ponganis.
- 30 July Commerce, commenting to the National Marine Fisheries Service on the Steller sea lion decline; noting that, as concluded in the 3 December 1998 biological opinion on the walleye pollock fisheries in the Bering Sea/Aleutian Islands region and the Gulf of Alaska, the fisheries may be contributing to the decline; urging the Service to identify the research and monitoring activities necessary to verify that the reasonable and prudent alternatives set forth in the biological opinion have the expected effect and, if available resources are insufficient to undertake the identified programs, take all possible steps to acquire the needed funding,

personnel, and logistical support; further urging the Service to (1) document the principal foraging areas of the various age/sex classes of sea lions present at different times of the year at the major haul-out sites and rookeries in the Gulf of Alaska and the Bering Sea/Aleutian Islands area, (2) determine the quantities, sizes, and depth distributions of pollock, Atka mackerel, and other potential forage fish present in the principal sea lion foraging areas at different times of the year, and (3) monitor prey availability in areas that are and are not fished to determine how fishing effort and temporal and spatial variation in that effort affect prey availability; announcing the intent to highlight Steller sea lions at the Marine Mammal Commission annual meeting; requesting that the Service develop a research/monitoring plan and estimates of associated resource needs for distribution to the Commissioners and Committee of Scientific Advisors prior to the meeting; and recommending that, if this information is not available, the Service take immediate steps to acquire and provide it for comment.

- 30 July Commerce, commenting to the National Marine Fisheries Service on the proposed issuance of permits authorizing the taking of endangered and threatened species of marine mammals incidental to commercial fishing operations and criteria used to determine whether fisheries are having a negligible impact on affected stocks; recommending that the Service support an amendment to the Marine Mammal Protection Act to eliminate the requirement that take reduction plans be prepared for strategic stocks for which fishery-related mortality and serious injury are inconsequential; noting that using 10 percent of a stock's potential biological removal level as a threshold for a negligible impact determination may not be appropriate for stocks that are declining despite the fact that known human-caused injuries and mortalities are only a small fraction of the potential biological removal level; noting that the Service's criteria did not indicate how it intended to attribute and quantify adverse effects that may result indirectly from human activities; recommending that the Service discuss whether and how indirect human-related effects will be factored into negligible impact determinations; urging the Service to clarify its criterion for making negligible impact determinations for stocks that are declining; recommending that the Service, before authorizing any level of taking, explain why it believes the existing levels of fisheries-related taking are negligible for the western stock of Steller sea lions; and further recommending that Table 1 be expanded to include the calculated potential biological removal level, the estimated level of total human-related mortalities and serious injuries, and the estimated number of marine mammals killed or seriously injured by each of the involved fisheries.
- 4 August National Fish and Wildlife Foundation, commenting to the Southwest Region Partnership Office on a funding request for a cooperative, multi-agency marine debris clean-up project in the Northwestern Hawaiian Islands; noting the project's importance in reducing entanglement risks for Hawaiian monk seals; also noting the importance of Foundation support for past clean-up efforts; and urging the Foundation to grant the funding request.
- 16 August Commerce, scientific research permit, Thomas R. Keickhefer.
- 18 August Interior, public display and enhancement permit, Dallas World Aquarium.
- 19 August Commerce, amendment of scientific research permit, James T. Harvey, Moss Marine Landing.
- 20 August Interior, public display permit, Ferris State University.
- 24 August Commerce, amendment of scientific research permit, Carole A. Conway.
- 24 August Commerce, amendment of scientific research permit, Donald B. Siniff.

- 31 August Interior, public display permit, Toledo Zoo.
- 31 August Interior, scientific research permit, Gordon B. Bauer, New College of the University of South Florida.
- 31 August Interior, amendment of scientific research permit, Gordon B. Bauer, New College of the University of South Florida.
- 31 August Interior, public display permit, Aquarium of the Americas/Audubon Institute.
- 7 September Commerce, scientific research permit, John L. Bengtson, National Marine Mammal Laboratory.
- 8 September Commerce, commenting to the National Marine Fisheries Service on the notice concerning the U.S. Air Force request to modify its small-take authorization; offering no objection to the addition of the Minotaur rocket type to the list of rockets that may incidentally take small numbers of harbor seals and California sea lions during launches from Vandenberg Air Force Base, provided the Service is satisfied that the current monitoring program will detect any possible cumulative adverse effects.
- 8 September State Committee of the Russian Federation for Environmental Protection, commenting to the Chairman on the planned import from Russia of 200 tons of white whale meat to Japan; stating that the available information on (1) size, current status, and discreteness of potentially affected stocks; (2) the harvest methods to be used; (3) whether the numbers of animals struck and lost are to be reported and factored into the quota determinations; and (4) planned biosampling and monitoring programs is insufficient and calls into question the appropriateness of the harvest and the sale of the meat.
- 9 September Commerce, commenting to the National Oceanic and Atmospheric Administration on the status of white whales in Russian waters; noting the insufficiency of information for determining stock status; noting the precedent-setting potential of the proposed import of whale meat to Japan with regard to international trade of small cetaceans; and recommending that representations be made at the highest levels possible to bring a halt to the planned taking and sale of white whales.
- 9 September Commerce, commenting to the National Marine Fisheries Service on proposed revisions to regulations that govern the taking of marine mammals incidental to fishing operations by purse seine vessels in the eastern tropical Pacific Ocean to reflect the provisions of the International Dolphin Conservation Program Act; providing specific comments on the proposed rule; and recommending the adoption of the rule, subject to inclusion of the recommended changes.
- 15 September Commerce, amendment of scientific research and enhancement permit, R. Michael Laurs, Southwest Fisheries Science Center.
- 17 September Florida Fish and Wildlife Conservation Commission, commenting to the Executive Director on the need for continued support of the Manatee Technical Advisory Council, and requesting that the Commission advise the Commission on its plans for the future of the Council.
- 1 October Commerce, commenting to the National Marine Fisheries Service on three right whales entangled in fishing gear in the Great South Channel; recommending that the Service take steps, before the spring 2000 right whale migration through the area, to prohibit gillnet fishing throughout the entire Great South Channel area designated as critical habitat for northern right whales; further recommending that the Service amend its Atlantic Large Whale

- Take Reduction Plan to include provisions for temporarily suspending gillnet and lobster fishing in areas where concentrations of right whales are sighted; and requesting that the Service advise the Commission on its plans to address these concerns at the Commission's annual meeting.
- 4 October Commerce, amendment of scientific research permit, James Darling.
- 6 October Commerce, photography permit, Paul Atkins, Moana Productions, Inc.
- 13 October Interior, scientific research permit, Darlene Ketten.
- 13 October Commerce, scientific research permit, Randall S. Wells.
- 15 October Interior, commenting to the Minerals Management Service on the Draft Environmental Impact Statement for the Destin Dome 56 Unit Development and Production Plan and Right-of-Way Pipeline Application; suggesting that the final environmental impact statement address the possibility that the proposed pipeline construction will disturb sediments and precipitate blooms of *Gymnodinium breve*, the dinoflagellate responsible for harmful red tides in the Gulf; and providing specific comments on the draft statement.
- 26 October Interior, scientific research permit, Monterey Bay Aquarium.
- 27 October Defense, commenting to the Navy on the Draft Overseas Environmental Impact Statement and Environmental Impact Statement for the Surveillance Towed Array Sensor System Low Frequency Active Sonar; recommending that the Navy consult with the National Marine Fisheries Service to determine the monitoring program necessary to validate the assumptions on which the "negligible effects" conclusion is based; also recommending that the final environmental impact statement reflect this additional information; further recommending that the final statement reflect the Marine Mammal Protection Act's definitions of level A and level B harassment; additionally recommending that the final statement explain the rationale for concluding that human divers would be affected adversely by exposure levels as low as 145 dB, but that marine mammals would not be affected adversely by exposure levels up to 180 dB; and providing specific comments on the draft statement.
- 1 November Commerce, scientific research permit, Louis M. Herman, University of Hawaii at Manoa.
- 1 November Commerce, photography permit, Michael Kundu.
- 1 November Commerce, amendment of scientific research permit, Michael F. Tillman, Southwest Fisheries Science Center.
- 10 November Commerce, scientific research permit, Jeff Davis, University of California Museum of Natural History.
- 15 November Commerce, amendment of scientific research permit, Dan R. Salden, Hawaii Whale Research Foundation.
- 15 November Commerce, amendment of scientific research permit, Rachel Cartwright.
- 23 November Commerce, commenting to the National Marine Fisheries Service on the need to expand the gillnet fishing closure in the Great South Channel to protect northern right whales; noting previous recommendations on this subject; reiterating earlier recommendations that the Service take immediate steps to expand the existing gillnet fishing closure in the Great South Channel

before the spring 2000 right whale migration; and requesting that the Service advise the Commission on its funding priorities for right whale recovery work in 2000.

23 November

Commerce, commenting to the National Marine Fisheries Service on the draft environmental assessment concerning testing of a pulsed-power device designed to control California sea lion predation on fish caught by recreational fishermen on commercial passenger fishing vessels; noting that the compression waves and sounds produced by the pulsed-power generator are expected to exceed the pain threshold of California sea lions; further noting that previous attempts to use high-intensity sounds to prevent seal and sea lion predation on salmonids have failed because the animals have habituated to, learned to avoid, or were deafened by the sounds; recommending that the use of a less aversive "warning" signal to precede triggering of the pulsed-power device be tested before testing of the pulsed-power device; also recommending that experienced sea lion trainers observe representative fishing operations to identify human behavior that may be contributing to the predation problem; noting that the finding of "no significant impact" is based on a number of inadequately supported assumptions, and, unless the rationale for those assumptions can be better explained, the taking of marine mammals likely to occur in association with the proposed testing would have to be authorized by a scientific research permit or small-take exemption; recommending that studies be done with captive animals to verify that exposure to compression waves and sound levels up to 205 dB will not cause hearing damage or other serious injury; suggesting that the environmental assessment point out uncertainties concerning possible additive adverse effects on invertebrates, finfish, and higher trophic-level species; and urging the Service to include in the environmental assessment a comparison of impacts associated with lethally removing the predatory sea lions versus those from the operational deployment of the pulsed-power generator.

23 November

Commerce, commenting to the National Oceanic and Atmospheric Administration on the need for an interagency coordination group on the potential impacts of persistent organic pollutants on marine mammals; suggesting that the group would be useful for identifying and collectively promoting needed research, monitoring, and mitigation programs, as well as considering and recommending actions to assess, monitor, and mitigate human activities that may be threatening the health of other biota and marine ecosystems in general; and suggesting that the group should include representatives of the National Marine Fisheries Service, the National Ocean Service, the Environmental Protection Agency, the Fish and Wildlife Service, the Biological Resources Division of the U.S. Geological Survey, the Minerals Management Service, the National Science Foundation, and the Marine Mammal Commission.

23 November

Commerce, commenting to the National Marine Fisheries Service on Hawaiian monk seal recovery needs; recommending that the Service prohibit lobster fishing at all major monk seal breeding atolls until the importance of lobsters in monk seal diets can be determined; also recommending that the Service take immediate steps to prohibit longline fishing for sharks and establish a rule prohibiting all commercial fishing within 50 nautical miles of the Northwestern Hawaiian Islands until fishery management plans for sharks and other species have been prepared and reviewed for potential impacts on Hawaiian monk seals, pursuant to the consultation provisions of section 7 of the Endangered Species Act; and recommending that the Service consult with the Fish and Wildlife Service's Hawaiian Islands National Wildlife Refuge to identify and implement methods that would be unlikely to incidentally take monk seals and could be used for selectively culling Galapagos sharks observed patrolling waters off the monk seal pupping beaches at Trig Island.

23 November

Transportation, commenting to the U.S. Coast Guard on northern right whale and Hawaiian monk seal protection efforts; commending the Coast Guard for its support of a Bering Sea right whale survey during 1999; requesting the Coast Guard's aid in conducting a survey in

summer 2000; and recommending that the Coast Guard consult with the Fish and Wildlife Service to determine the timing and plans for constructing a new seawall at Tern Island, and that it take steps to fund and arrange for clean-up work to remove contaminated soils from old Coast Guard dump sites on the island prior to construction of the seawall.

23 November

Interior, commenting to the Fish and Wildlife Service on the sea otter population decline around Adak Island in Alaska; recommending that the Service reprogram funds, seek supplemental funding, or take other steps as necessary to conduct a sea otter survey in late spring or early summer of 2000; noting the desirability of including in the survey an assessment of representative sea otter habitats; recommending that the Service consult with the National Marine Fisheries Service to determine if there have been any changes in killer whale abundance, distribution, movements, foraging behavior, or general condition in the areas where the sea otter population decline has occurred; and recommending that the Service explore with the National Marine Fisheries Service the possibility of combining efforts to survey killer whale distribution, abundance, and general condition with the recommended rangewide sea otter survey.

23 November

Commerce, commenting to the National Marine Fisheries Service on Steller sea lions in Alaska; recommending that an update of the 1992 Steller Sea Lion Recovery Plan be made a priority and that the Steller Sea Lion Recovery Team be convened as soon as possible to provide advice on research and management needs and priorities; recommending that either a current Service employee be detailed or a contractor hired to help the Service's Steller Sea Lion Recovery Coordinator complete the update as quickly as possible; also recommending that a broadly based group of agencies and organizations with related interests and responsibilities, chaired by the Service, be established to develop and oversee an implementation plan; noting that the biological opinion concluded that the walleye pollock fisheries are likely to jeopardize the sea lion population; further recommending that the Service ask fishing groups to provide a dedicated vessel for a sufficient period of time to conduct surveys of pollock and other possible Steller sea lion prey species in and near critical habitat areas; additionally recommending that the Service establish priorities for completion of a Steller sea lion co-management agreement with Alaska Native organizations; and recommending that the Service, in consultation with the Fish and Wildlife Service and affected Native groups, initiate a marking, tagging, and biosampling program for Steller sea lions.

30 November

Commerce, commenting to the National Marine Fisheries Service on the tuna-dolphin research program; noting a pressing need to initiate the necropsy studies mandated by the International Dolphin Conservation Program Act to collect sufficient data on indicators of stress related to chase and encirclement; repeating a recommendation made last year that high-level officials within the Department of Commerce inform their counterparts in those countries whose vessels fish for tuna by setting on dolphins that failure to cooperate with the Service's efforts to collect necropsy samples will be viewed as a sign of bad faith that will result in the Service revoking its initial finding on the effects of chase and encirclement on depleted dolphin stocks; also recommending, if necessary, that the Service immediately approach Congress to seek amendments to the International Dolphin Conservation Program Act designed to compel foreign nations to cooperate with said studies; additionally recommending that the Service, in consultation with the Marine Mammal Commission, revisit its plans for the necropsy study and develop alternative plans for collecting and analyzing a statistically significant number of samples from each of the depleted stocks in a shorter period of time; further recommending that the Service initiate discussions with the appropriate Congressional oversight committees about extending the deadline by which the final determination on the effects of chase and encirclement is to be made; and recommending that the Service take steps to ensure that the Commission is consulted concerning all aspects of the research program.

- 30 November Commerce, commenting to the National Marine Fisheries Service on pinniped-fishery interactions on the west coast; noting that pinnipeds have the potential to have significant adverse effects on already depleted runs of salmonids; recommending that the Service continue to work closely with individual states to identify situations in which use of the pinniped removal authority of section 120(a) may be appropriate; also recommending that the Service prepare and distribute to fishermen and post at docks and other locations, educational materials describing what deterrence measures are permissible under the Marine Mammal Protection Act; further recommending that the Service convene a workshop of fishery specialists, marine mammal behaviorists, trainers, and other appropriate experts, including those involved in the development of technologies that could be brought to bear on the problem, to recommend a program of specific studies directed at identifying safe and effective deterrence measures; recommending that the Service investigate possible visual, auditory, and other cues that seals and sea lions may be using to locate fishing operations; and recommending that the Service coordinate with Sea World to conduct appropriate examinations of the hearing or ears of three sea lions exposed to the acoustic deterrent devices at Ballard Locks.
- 10 December Commerce, commenting to the National Marine Fisheries Service on the unusually high number of gray whale strandings along the Pacific coasts of the United States, Canada, and Mexico in 1999; recommending that, if it has not already done so, the Service take steps to adopt a die-off response plan by the end of the year in case the high level of mortality continues in 2000; and recommending that the Service (1) continue adult and calf counts and photogrammetry studies of gray whales during their northbound migrations for at least the next three years, (2) conduct a count during the southbound migration in 2001 to determine if there is a changing trend in total abundance, and (3) continue to provide advice to Mexican scientists regarding efforts to prevent degradation of the critical breeding and calving lagoons in Baja California.
- 10 December Commerce, scientific research permit, Stephen D. Busack, North Carolina State Museum of Natural Sciences.
- 10 December Commerce, scientific research permit, Thomas R. Loughlin, National Marine Mammal Laboratory and Alaska Fisheries Science Center.
- 13 December Commerce, photography permit, John Hyde, Wild Things Photography.
- 13 December Interior, scientific research permit, Lynn W. Lefebvre, Florida Caribbean Science Center.
- 14 December Commerce, commenting to the National Marine Fisheries Service on concerns about the adequacy of funding for the Hawaiian monk seal program; and recommending that the Service take steps through reallocating resources, seeking supplemental funding, or restructuring out-year budget requests to meet the needs of the program.
- 21 December Commerce, commenting to the National Marine Fisheries Service on the status and conservation needs of Cook Inlet beluga whales and on a proposed depletion designation for the stock; recommending that the Service publish a final depletion finding as quickly as possible; also recommending that the Service give high priority to implementing by 1 October 2000 a mechanism to govern the harvest, giving consideration to (1) concluding an enforceable cooperative management agreement with all Native hunting groups that will ensure that sustainable harvest levels are not exceeded, (2) promulgating regulations in accordance with section 101(b) of the Marine Mammal Protection Act to impose limits on the numbers of Cook Inlet beluga whales that can be taken for subsistence purposes, and (3) securing a long-term legislative solution that would prevent overharvesting; noting that it will most likely be difficult to obtain a binding agreement from all hunting groups to abide by harvest limits;

requesting a clarification as to how the Service interprets the term “Alaska Native organization,” and an assessment of whether the Service believes the definition is limiting its ability to pursue co-management agreements concerning Cook Inlet beluga whales; further recommending that the Service begin making all necessary preparations for initiating a rulemaking to limit the harvest as quickly as possible after issuing a final depletion designation; also recommending that the Service immediately consult with its legal counsel to confirm that procedures to govern the rulemaking process are in place; also recommending that the Service, if it has not already done so, take steps to advise Congress of the situation regarding Cook Inlet beluga whales and the possible need for additional remedial legislation; and finally recommending that the Service publish a proposed rule to list the Cook Inlet beluga stock as either endangered or threatened.

23 December

Interior, commenting to the Fish and Wildlife Service on the status and management of the California sea otter population; providing a discussion draft of an action plan to promote recovery of this population and develop a long-range conservation strategy; and recommending that the Service convene a meeting of appropriate representatives of the agencies and organizations with interests in and responsibilities for this population before the end of February 2000 to (1) review and assign priorities to the tasks identified in the draft plan, (2) identify ongoing or additional research, monitoring, and management programs that should be afforded priority consideration, (3) reach agreement on the agencies and the groups within agencies that have lead responsibility for the various tasks, (4) determine when the various tasks reasonably can be initiated and completed, given funding or other constraints, and (5) if available funding is insufficient to begin implementing the priority tasks immediately, determine whether the required funding can be obtained through reprogramming, requesting supplemental funds, or other means so that critical tasks can be started in fiscal year 2000.

23 December

Commerce, commenting to the National Marine Fisheries Service on the Great South Channel gillnet fishery closure; agreeing that the Service needs to consult with the Atlantic Large Whale Take Reduction Team; urging the Service to consider the steps needed to implement any final agreed measures before the arrival of right whales into the Channel; and requesting the Service to advise the Commission if it foresees any difficulty in having the needed measures in place by the time the whales return.

APPENDIX B

REPORTS OF COMMISSION-SPONSORED ACTIVITIES AVAILABLE FROM THE MARINE MAMMAL COMMISSION¹ OR THE NATIONAL TECHNICAL INFORMATION SERVICE (NTIS)²

- 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)
- Baur, D.C. 1995. Reconciling the legal mechanisms to protect and manage polar bears under United States laws and the international agreement for the conservation of polar bears. Final report for MMC contract T94071388. NTIS PB95-272092. 103 pp. (A07)
- Baur, D.C. 1996. Legal ramifications of the GATT panel reports on the United States' ban on the importation of yellowfin tuna products. Final report for MMC contract T94071375. NTIS PB97-104756. 102 pp. (A06)
- 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. Cattanaach. 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 MM2079341-0. 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 MM1300702-9. NTIS PB81-109860. 91 pp. (A06)

¹ Single copies of designated reports are available on request from the Marine Mammal Commission, 4340 East-West Highway, Room 905, Bethesda, Maryland 20814; telephone: (301) 504-0087; fax: (301) 504-0099.

² Price codes for reports available from NTIS 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.

- 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)
- Dedina, S., and E. Young. 1995. Conservation and development in the gray whale lagoons of Baja California Sur, Mexico. Final report for MMC contract T10155592. NTIS PB96-113154. 56 pp. (A04)
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APPENDIX C

SELECTED LITERATURE PUBLISHED ELSEWHERE RESULTING FROM COMMISSION-SPONSORED ACTIVITIES

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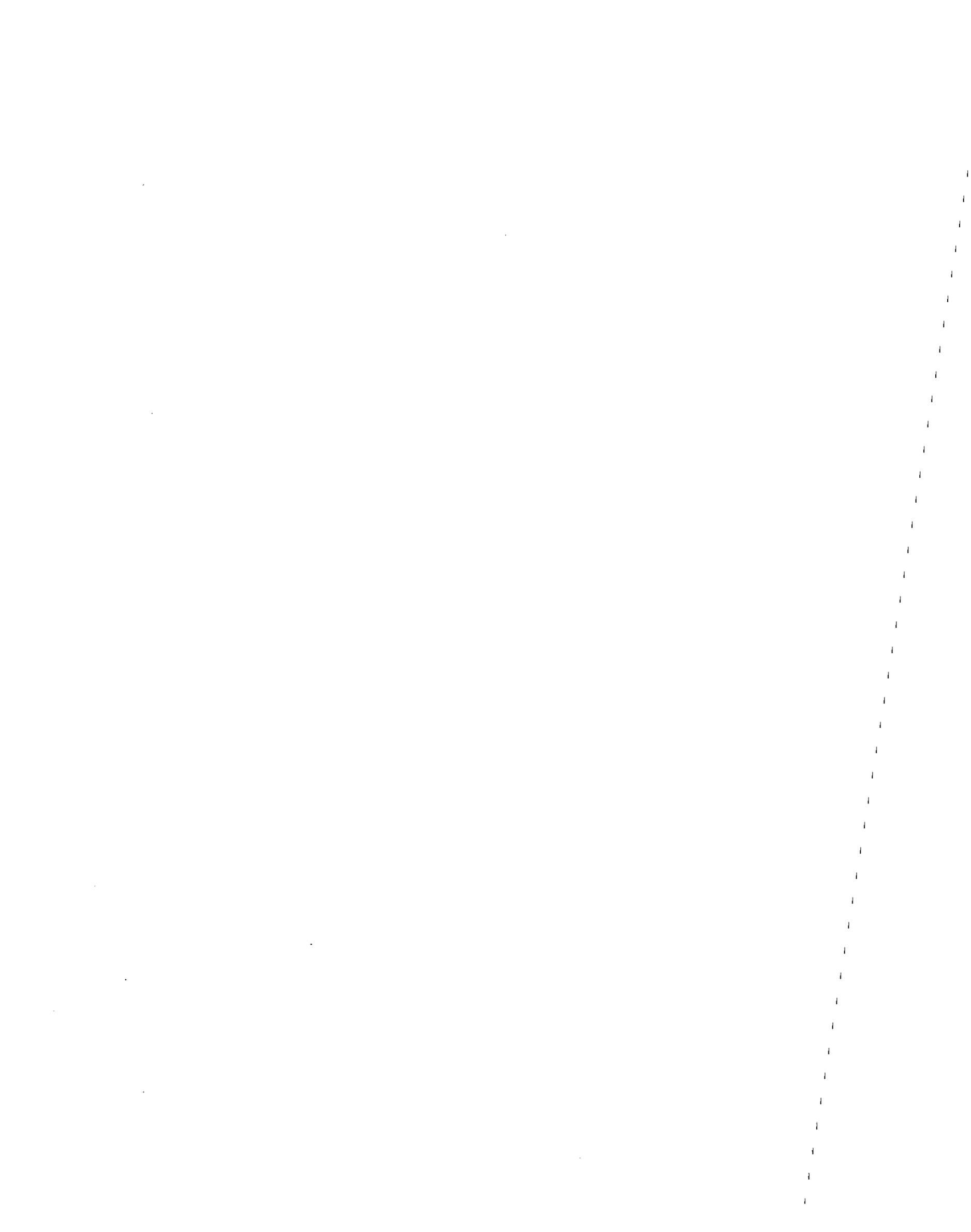
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APPENDIX D

STATEMENT OF THE MARINE MAMMAL COMMISSION

Submitted to the House Committee on Resources,
Subcommittee on Fisheries Conservation, Wildlife, and Oceans,
for the Oversight Hearing Regarding Implementation
of the 1994 Amendments to the Marine Mammal Protection Act

29 June 1999

Pursuant to section 204 of the Marine Mammal Protection Act, the Marine Mammal Commission transmits to Congress, by January 31 of each year, a report describing its activities and accomplishments during the preceding year and setting forth the recommendations made by the Commission to other Federal agencies along with their responses thereto. The Commission's annual report for calendar year 1998 was transmitted to this Committee earlier this year. Among the other duties of the Commission, as set forth in section 202(a) of the Act, is to recommend to the Secretaries of Commerce and the Interior and other Federal officials such steps as it deems necessary or desirable for the protection and conservation of marine mammals. Further, the Commission is tasked with recommending to the Secretaries and to Congress such additional measures as it deems necessary or desirable to further the policies of the Act, including provisions for the protection of Indians, Eskimos, and Aleuts, whose livelihood may be adversely affected by actions taken under the Act. In furtherance of these obligations, the Commission has prepared this statement reviewing steps taken to implement the 1994 amendments to the Marine Mammal Protection Act, to identify actions that remain to be completed, and to highlight areas in which we believe Congress should focus its attention as it considers reauthorization of the Act.

The Marine Mammal Protection Act Amendments of 1994, Public Law 103-238, made extensive changes to the Marine Mammal Protection Act. The amendments included the addition of four new sections to the Act and revisions to 15 pre-existing sections.

Taking Incidental to Commercial Fisheries, Sections 117 and 118

The centerpiece of the 1994 amendments was the adoption of a new regime to govern the take of marine mammals incidental to commercial fishing operations. The

new regime was structured in part upon scientifically based guidelines developed by the Commission and represented a compromise approach embraced by commercial fishing interests and environmental and animal welfare organizations. Rather than requiring fishermen to demonstrate that affected marine mammal stocks are at optimum sustainable population levels and will not be disadvantaged before any incidental taking could be authorized, as had been the case until 1988, the amendments allow incidental taking subject to the requirements that incidental mortality and serious injury of marine mammals be reduced to levels below a stock's potential biological removal level and, ultimately, to insignificant levels approaching a zero mortality and serious injury rate. A stock's potential biological removal level is calculated using a statutorily defined formula designed to ensure that any stock currently within its optimum sustainable population range will remain so, and that any stock below its maximum net productivity level will increase toward that level. The Commission believes that the current methodology for determining potential biological removal levels is scientifically sound, appropriately takes into account the amount and quality of information regarding a population, is appropriately conservative, and should be left unchanged.

The new incidental take regime replaced the interim exemption enacted in 1988 as section 114 of the Act. Inasmuch as section 114 is no longer in effect, the Commission recommends that, as a housekeeping measure, it be repealed. Conforming changes to other provisions that reference section 114, *e.g.* section 102(a), would also be necessary.

a. Stock assessments

Section 117, added by the 1994 amendments, requires the National Marine Fisheries Service and the Fish and Wildlife Service to publish and periodically update an

assessment for each stock of marine mammal that occurs in U.S. waters. Among other things, the assessments are to provide a minimum population estimate and determination of current population trend, estimate annual human-caused mortality and serious injury, estimate the stock's potential biological removal level, and indicate whether or not the stock is a strategic stock. A strategic stock is defined as one that is listed as endangered or threatened under the Endangered Species Act or declining and likely to be listed in the foreseeable future, designated as depleted under the Marine Mammal Protection Act, or for which human-caused mortality exceeds the estimated potential biological removal level. Section 117 also required the National Marine Fisheries Service to establish three regional scientific review groups to advise the Service on the information to be included in the stock assessments and on research needs. The Commission believes that the process for preparing and obtaining expert scientific review of stock assessments is working well and does not recommend any amendment of section 117.

b. Incidental take authorization

Section 118 sets forth the operational requirements of the new incidental take regime. It requires the National Marine Fisheries Service to classify commercial fisheries according to the frequency with which marine mammals are killed or seriously injured. Fishermen operating in fisheries that frequently or occasionally kill or seriously injure marine mammals (category I and II fisheries) are required to register and, when requested, carry observers on their vessels. All fishermen are required to report any marine mammal mortalities and injuries that occur incidental to their operations.

This process has been working reasonably well. In some fisheries, however, not all vessel owners required to register have been doing so. In this regard, the National Marine Fisheries Service apparently believes that there is some ambiguity as to whether it is a violation of the Marine Mammal Protection Act to conduct fishing operations in a category I or II fishery without first registering and obtaining an authorization certificate. As a result, the Service has been reluctant to take enforcement actions against these fishermen. Also, inasmuch as the requirement to carry observers only applies to registered vessels, the Service's ability to monitor some fisheries has been compromised by the lack of full compliance with the registration requirement.

The Commission believes that the applicable provision of the Act is clear. Section 118(c)(3)(C) specifies that it is a violation of the Act to engage in a category I or II fishery

without having obtained the required authorization — *i.e.*, without having registered. Failure to register constitutes a serious violation of the Act and should be treated as such, with the assessment of a substantial penalty under section 105. Although we believe that the existing provision is clear, this is an important enough issue that clarification, either by amendment or in report language, is appropriate. In addition, the Commission believes that Congress should consider strengthening the incentive for fishermen to register by amending section 106 of the Act to enable the Service to seek the forfeiture of the catch from any fishing operations conducted without obtaining the required authorization or to assess a substantial fine against the vessel.

The Commission also notes that available funding does not seem to have been sufficient to place observers within all fisheries and on all fishing vessels that need to be monitored or to place them at levels needed to provide statistically reliable results. To address this, the Commission recommends that Congress consult with the National Marine Fisheries Service to determine the cost of an adequate observer program and to explore alternatives that would require a contribution from the involved fisheries.

The amendments directed the National Marine Fisheries Service to develop and implement a take reduction plan for each strategic stock that interacts with a category I or category II fishery. The initial objective of a take reduction plan is to reduce incidental mortality and serious injury to less than the stock's potential biological removal level within six months of implementing the plan. The long-term goal is to reduce, within five years of the plan's implementation, incidental mortality and serious injury to insignificant levels approaching a zero mortality and serious injury rate. Each plan is to be developed based upon the recommendations of a take reduction team consisting of representatives of Federal and State agencies, fishery management councils, academic and scientific organizations, environmental groups, commercial and recreational fishermen, and, when appropriate, Alaska Native organizations or Indian tribes.

c. Take reduction plans

To date, the National Marine Fisheries Service has established five take reduction teams, all of which have submitted a recommended take reduction plan. In all but one case the Service has issued a final plan and has published regulations to implement the plan. The one exception is the Atlantic Offshore Cetacean Take Reduction Plan, which, because of restrictions on the swordfish gillnet fishery imposed under the Magnuson-Stevens Fishery

Conservation and Management Act, is no longer pertinent to the primary threat it was designed to address. This being the case, the National Marine Fisheries Service intends to reconstitute the take reduction team to consider whether the plan needs to be revised to reduce the taking of cetaceans in other offshore fisheries.

Among the plans that have been implemented, the most successful has been the Pacific Offshore Cetacean Take Reduction Plan. Regulations instituted in 1997 to require nets to be set at least 36 feet below the ocean surface and to require the use of pingers appear to have succeeded in reducing mortalities and serious injuries to less than the potential biological removal level for all strategic stocks. Although regulations establishing time and area closures and requiring that pingers be placed on nets have been adopted to implement the take reduction plans aimed at reducing the mortality and serious injury of harbor porpoises in the Gulf of Maine and in mid-Atlantic gillnet fisheries, it remains unclear that these measures will be effective in reducing take levels to anywhere near the stock's potential biological removal level. Also, the effectiveness of the Atlantic Large Whale Take Reduction Plan, aimed at reducing the take of right and humpback whales in coastal gillnet and lobster pot fisheries, is questionable. Thus far this year, at least four right whales have become entangled in gear from these fisheries. The potential biological removal level for this highly endangered species is less than one. While some progress has been made toward meeting the take reduction mandates of section 118, oftentimes actions have taken too long to implement and have not fully addressed the fishery-marine mammal interaction problems.

Of particular concern to Congress when it passed the 1994 amendments was the high level of take of harbor porpoise from the Gulf of Maine stock. Although a special provision was included to enable the National Marine Fisheries Service to expedite publication of the assessment of this stock, the Service did not avail itself of that opportunity. Congress also recognized the special difficulty there might be in reducing fishery-related mortality and serious injury of Gulf of Maine harbor porpoises to below the stock's potential biological removal level and allowed the Service to extend the time needed to meet that goal until 1 April 1997. Despite this specific time frame, mortality and serious injury have continued to exceed the stock's potential biological removal level by a considerable amount.

The Commission is hopeful that additional measures instituted by the Service earlier this year, including time and area closures and requirements to deploy pingers on nets, will result in substantial reductions in the number of harbor porpoises incidentally killed and injured. However,

it is doubtful that those measures alone will be sufficient to achieve the required reductions. Under a settlement agreement reached between the Service and environmental groups that challenged its failure to reduce the incidental take of harbor porpoise within the statutorily mandated time frame, estimates of mortalities and serious injuries for the first four months of this year are to be made available by the end of July.

As the Act is currently written, the National Marine Fisheries Service is required to prepare and implement a take reduction plan for all strategic stocks that interact with a category I or II fishery. It should be noted, however, that for some stocks, the frequency of interaction may be relatively low and that the reason a stock is considered strategic (*e.g.* it is listed as endangered or threatened) may have nothing to do with taking incidental to commercial fisheries. Although section 118(f)(3) assigns highest priority to developing plans for those stocks for which fisheries-related taking exceeds the potential biological removal level, those that have a small population size, and those that are declining most rapidly, there should be some recognition that some strategic stocks simply will not benefit from development of a take reduction plan. The Commission therefore recommends that the Act be amended to specify that plans need not be prepared for those strategic stocks for which mortality or serious injury resulting from commercial fisheries is inconsequential.

The Commission believes that certain stocks of bottlenose dolphins, which are taken in a variety of fisheries along the Atlantic Coast, can benefit from the development and implementation of a take reduction plan. Although it has been difficult to assess the impact of commercial fisheries and other human activities on this species because of considerable uncertainty regarding stock structure, based on the number of bottlenose dolphin carcasses recovered with net markings or other evidence of having been entangled in fishing gear, the impact could be substantial. In addition to preparation of a take reduction plan, it would be useful for the Service to institute an expanded observer program to get a better handle on the number of bottlenose dolphins being taken in commercial fisheries along the Atlantic coast.

d. Zero mortality rate goal

Regulations implementing most provisions of section 118 were issued by the Service in 1995. A couple of issues, however, remain outstanding. Section 118(b) mandates that commercial fisheries reduce the incidental mortality and serious injury of marine mammals to insignificant levels approaching a zero mortality and serious injury

rate within seven years — that is, by 30 April 2001. Beginning in 1997, the National Marine Fisheries Service was to review the progress toward meeting that goal on a fishery by fishery basis and submit a report of its findings to Congress by the end of April 1998. Although considerable work has been done, the report has yet to be completed. As we understand it, one of the sticking points has been how to quantify the zero mortality rate goal. In commenting on an earlier Service proposal, the Commission noted that, while it may be appropriate to equate the goal with reducing mortalities and serious injuries to some biologically insignificant level (*e.g.*, 10 percent of a stock's potential biological removal level), for certain large stocks, this would still allow large numbers of animals to be taken. The Commission therefore favors a two-tiered approach, pegged not only to some percentage of a stock's potential biological removal level, but to some numerical limit.

e. Serious injuries

Another issue that has yet to be fully resolved is determining when an injury to a marine mammal is to be considered serious. Under section 118, fishermen are required to report all injuries, but only mortalities and serious injuries are to be considered when classifying fisheries and developing take reduction plans and in determining if the zero mortality rate goal has been achieved. Implementing regulations define "serious injury" as any injury that will likely result in mortality. However, it is not always apparent at the time a marine mammal is released from fishing gear whether its injuries are life threatening. To address this issue, the National Marine Fisheries Service held a workshop in 1997 to establish more definitive criteria for differentiating between serious and non-serious injuries. The Service intends to draw on the report from that workshop to establish guidelines for determining when injuries will be considered serious. The Commission believes that the conclusions set forth in the workshop report are reasonable and encourages the Service to publish guidelines without delay.

f. Exclusions

There are also some noteworthy exclusions from the new incidental take regime. It does not govern the incidental taking of California sea otters, which remain subject to Public Law 99-625, or the taking of marine mammals in the eastern tropical Pacific fishery for yellowfin tuna, which is subject to separate provisions of the Act. Also, it prohibits fishermen from intentionally taking marine mammals by lethal means to protect fishing gear or catch. Further, the taking of marine mammals listed under the Endangered Species Act is authorized not only by section

118, but by special requirements set forth in section 101(a)(5)(E).

The National Marine Fisheries Service has interpreted the sea otter exclusion as being applicable to all elements of section 118. While documented mortalities and serious injuries of California sea otters are noted in the most recent list of fisheries, the Service does not factor such takes into its fishery categorizations or into its decisions with respect to allocating observers. For the past four years the California sea otter population, listed as threatened under the Endangered Species Act, has been declining. Among the suspected causes of the decline is fisheries-related mortality. To resolve the issue, the Marine Mammal Commission has recommended that an observer program be implemented for those fisheries that may be taking California sea otters, including pot and trap fisheries and the halibut gillnet fishery, which has expanded into the Monterey Bay area. Although observers are being deployed in the halibut fishery this year, this is primarily to monitor the take of harbor porpoises. If the level of harbor porpoise mortality detected is low, this observer program may be discontinued at the end of the year even if sea otter take is high. The Commission believes that there needs to be a better mechanism for documenting and addressing fishery-related takes of California sea otters. One way in which this could be accomplished would be to specify that this species is to be factored into classifications in the list of fisheries and decisions regarding observer placement even though no taking is authorized.

Taking of Endangered and Threatened Species Incidental to Commercial Fisheries, Section 101(a)(5)(E)

Section 101(a)(5)(E) directs the National Marine Fisheries Service to authorize the incidental taking of marine mammals listed as endangered or threatened if it determines 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 section 118, a monitoring program has been established, the vessels are registered, and a take reduction plan has been, or is being, developed. The Service 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 on the list, but which are not required to register, are covered by the authorization provided that they report any incidental mortality or serious injury.

In 1995, the Service made the required findings and authorized taking from three stocks — the eastern and western stocks of Steller sea lion and the central North Pacific stock of humpback whale. These authorizations, originally set to expire at the end of 1998, have been extended through the end of this month. On 27 May 1999 the Service published a proposal to extend these authorizations for three years and to issue authorizations allowing the incidental taking of fin whales from the western north Atlantic stock and humpback whales from the North Atlantic stock.

Pinniped-Fisheries Interactions, Section 120

Section 120, added by the 1994 amendments, called on the Secretary of Commerce to study pinniped-fishery interactions and provided 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.

a. Lethal removal authority

Under section 120(b), States may apply to obtain authorization for the intentional lethal taking of pinnipeds when individually identifiable animals are having a significant negative 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. 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 the National Marine Fisheries Service determines that the State has made the required showings, it is to establish a Pinniped-Fishery Interaction Task Force to examine the problem and recommend 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 Service is to take final action on the application within 30 days of receiving the task force's recommendation.

To date, only Washington State has applied for pinniped removal authority, this to remove sea lions preying upon

steelhead salmon migrating through Ballard Locks. Although lethal removal was authorized in that instance, non-lethal deterrence, along with the non-lethal removal of three problem animals to a public display facility, proved effective in addressing the situation. As demonstrated by this situation, it is possible for only a few individual pinnipeds to have a considerable impact on dwindling salmonid stocks at some sites. This being the case, such occurrences may be relatively simple to address by removing those problem animals and instituting deterrence measures to prevent others from taking their place. The Commission therefore recommends retaining the lethal removal authority unchanged to enable the Service and States to respond to specific problems involving localized predation of endangered, threatened, or declining salmonid stocks.

b. Pacific fisheries

The amendments also directed the National Marine Fisheries Service to undertake further study of pinniped-fishery interactions. Section 120(f) required the Service 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 Service was also to investigate the broader impacts that these pinnipeds may be having on the coastal ecosystems of Washington, Oregon, and California. The results of these studies were to be reported to Congress, along with recommendations developed by the Service in consultation with the Pacific States Marine Fisheries Commission to address the identified problems.

The Service transmitted its report to Congress earlier this year. The report concluded that, although pinniped predation did not appear to be a cause of any of the salmonid declines in California, Oregon, and Washington, such predation could have negative effects on salmon stocks in those areas where physical conditions (*e.g.*, bottlenecks) cause the fish to concentrate during their migrations. This conclusion was based primarily on the experience at Ballard Locks, where California sea lions had been preying upon a significant proportion of the few returning winter-run steelhead. Among other things, the Service recommended that State and Federal resource agencies be authorized to kill California sea lions and harbor seals in areas where they are known or believed to be preying on depleted salmonid stocks when 1) there are no non-lethal means available to address the problem as effectively or as economically, 2) a salmonid conservation or recovery plan is in place or under development, and 3) recovery efforts

to address other factors affecting the stock's status are underway.

The Commission shares the view that resource agencies should be given authority to stop pinniped predation that is preventing or impeding the recovery of depleted salmonid stocks and that lethal methods are appropriate when non-lethal measures are not likely to be practical or effective. However, the Commission believes that such authority should be available only in those instances when a conservation or recovery plan that appropriately addresses all factors responsible for the salmonid stock's depressed status is in place, the plan has been made available for review by interested parties and approved by the Service, and procedures have been established to verify that the authorized management actions have the expected results.

Section 120(g) authorized, but did not require, the Service 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. No such study has been undertaken.

c. Gulf of Maine aquaculture

Section 120(h) required the Service 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 Service provided Congress with a report of its findings, including recommendations regarding alternatives for mitigating such interactions, in August 1997. The report noted that both pinniped populations and aquaculture operations in the Northeast have grown in recent years. Along with this growth has come an increasing number of complaints that seals are targeting penned fish. Aquaculture operators report that fish are not only eaten or injured, but escape when net pens are damaged. Also, the presence of seals in and around pens is believed to expose the fish to stress, which makes them more susceptible to diseases and less marketable. While resulting economic losses may be substantial, the report concluded that better data on the nature and extent of damage being caused by seals was needed and called on the industry to collect and provide additional information. The report also placed responsibility on the industry to develop facilities and deterrence technologies that will prevent seals from getting to penned fish. The Service concluded that, in

those instances when a seal manages to enter a pen despite the operator having done everything feasible to prevent the entry, and when efforts to remove the seal could jeopardize human safety, lethal removal authority should be provided. The Commission concurs with this conclusion but stresses that, before being given such authority, an operator should be required to meet certain standards with respect to pen design and construction.

Non-Lethal Deterrence of Marine Mammals, Section 101(a)(4)

As noted previously, the new incidental take regime for commercial fisheries specifically excluded authorization for intentional lethal taking of marine mammals to protect fishing gear or catch. However, under section 101(a)(4), as amended in 1994, fishermen are authorized to use non-lethal means to deter a marine mammal from damaging their gear or catch. This provision also authorizes owners of private property or their agents to use non-lethal means to deter marine mammals from damaging that property and government employees to deter marine mammals from damaging public property. Non-lethal deterrence of marine mammals to prevent endangerment of personal safety was also authorized by the amendment. In each case, however, the deterrence measures used must not result in the death or serious injury of a marine mammal.

The Secretaries of Commerce and the Interior, in consultation with appropriate experts, were required to publish guidelines setting forth the measures that may be taken to deter marine mammals safely and to prohibit, by regulation, any form of deterrence that is determined to have a significant adverse effect on marine mammals. For species listed as threatened or endangered under the Endangered Species Act, the Secretaries were to specify nonlethal deterrence measures that may be used.

The National Marine Fisheries Service issued proposed deterrence regulations in 1995, but has yet to publish final regulations. No measures for safely deterring endangered and threatened marine mammals have been proposed. In this regard, it should be noted that, even if the Service were to identify measures for safely deterring endangered and threatened species under the Marine Mammal Protection Act, employing such measures likely would constitute a violation of the Endangered Species Act, which contains no similar provision authorizing intentional taking. The Fish and Wildlife Service has yet to take action to implement any portion of the deterrence provision.

Permits for Public Display, Scientific Research, and other Purposes, Section 104

The 1994 amendments included changes to most of the Act's permit provisions and added authority for the issuance of permits for commercial and educational photography and the importation of polar bear trophies from Canada. Among other things, the amendments resolved the issue of whether the Marine Mammal Protection Act confers authority for supplementing the care and maintenance requirements established by the Animal and Plant Health Inspection Service under the Animal Welfare Act. Permits issued under the Marine Mammal Protection Act may continue to impose conditions pertaining to the methods of capture, supervision, care, and transportation as they apply to the authorized taking or importation, but may not specify how a collector is to maintain marine mammals once they are housed in the captive facility.

In some instances, the Animal and Plant Health Inspection Service has not acted quickly enough to fill the void left by the nullification of National Marine Fisheries Service policies regarding captive marine mammals. For example, at the time the 1994 amendments were enacted, permits issued by the National Marine Fisheries Service to facilities conducting swim-with-the-dolphin programs included conditions designed to minimize the potential for harmful or dangerous interactions between human participants and dolphins. In addition, the Service contracted for a study of these programs by a marine mammal behaviorist, which raised safety concerns regarding the design of certain types of programs. The 1994 amendments ceded full authority for these programs to the Animal and Plant Health Inspection Service, which indicated its intent to issue regulations promptly to govern swim programs. Although such regulations were issued late in 1998, their applicability was suspended earlier this year. While the Service has been monitoring swim-with-the-dolphin programs for compliance with its general marine mammal care and maintenance regulations, the Commission urges the Service to speed its issuance of specific regulations for these activities in order to clarify safe program expectations and responsibilities.

Another issue that has arisen in the past few years concerns traveling marine mammal exhibits. Although a limited number of such shows involving pinnipeds have been permitted over the years, recently an exhibitor sought authorization for a traveling show involving dolphins. Recognizing the high level of stress and other undue risks to cetaceans presented by traveling exhibits, the National Marine Fisheries Service published a policy statement in

1974 announcing that it would not issue permits authorizing such exhibits. The applicability of that policy, however, was nullified by the 1994 amendments, which no longer allow permit denials to be based on animal care concerns other than those addressed in standards adopted under the Animal Welfare Act.

In commenting on this permit request, the Marine Mammal Commission noted that traveling cetacean exhibits, by their very nature, pose unacceptably high risks and recommended that the permit be denied. The Commission also recommended that the Animal and Plant Health Inspection Service adopt a policy statement or issue regulations to the effect that traveling cetacean exhibits are likely to cause the animals excessive stress and will not be licensed. Although this particular application ultimately was denied, the Animal and Plant Health Inspection Service declined to address the issue generically as the Commission recommended, stating that it did not have authority to prohibit such exhibits. The Commission disagrees with the conclusion reached by the Service concerning the breadth of its authority. We believe that the Animal Welfare Act provides clear authority for the Service to prohibit any type of exhibit that poses significant risks to the animals involved and that there is a sufficient basis for determining that traveling cetacean exhibits pose such risks. Regardless of how it is accomplished, action needs to be taken to ban traveling cetacean exhibits.

Another situation that put marine mammals at risk involved bottlenose dolphins being maintained at a facility under a public display permit for possible reintroduction to the wild. The facility argued that the 1994 amendments to the Marine Mammal Protection Act had invalidated pre-existing permit conditions established by the National Marine Fisheries Service that required additional authorization prior to releasing the dolphins into the wild. It also challenged the authority of the Animal and Plant Health Inspection Service to limit its activities related to the release of the dolphins. The ambiguities concerning the applicable law and their respective authorities dissuaded either agency from taking swift and decisive action to prevent the unauthorized release of the animals. As a result, the two dolphins were transported offshore and released, despite the fact that they had not been properly prepared to fend for themselves in the wild. Although the dolphins were ultimately recaptured, both sustained serious injuries. In addition, the dolphin that remained in the wild the longest was emaciated when it was recaptured and likely would have died of starvation. Not only does premature release of captive marine mammals pose risks to the animals involved but, without proper medical screening, may expose wild populations to disease. Also, some marine

mammals, unless undesirable behaviors have been extinguished prior to release, may pose a safety hazard to people they encounter.

In the case involving the released dolphins, the facility operators ultimately were found to have violated the Animal Welfare Act and the Marine Mammal Protection Act and civil penalties were assessed. Nevertheless, the Commission believes that the provisions of the Marine Mammal Protection Act should be strengthened by adding a specific prohibition against releasing captive marine mammals, other than those being maintained under the stranding and rehabilitation program, absent specific authorization (*e.g.*, a scientific research permit structured to require sufficient preparation, medical screening, and monitoring of released animals).

Furthermore, the experience regarding the release of the dolphins points out the desirability of providing the National Marine Fisheries Service and the Fish and Wildlife Service and/or the Animal and Plant Health Inspection Service with explicit authority to seek injunctive relief to prevent anticipated violations of the Animal Welfare Act or Marine Mammal Protection Act when such violations pose risks to the welfare of the animals, the public, or wild marine mammal populations. Including authority to seek injunctions under the Marine Mammal Protection Act would be consistent with the provisions of the Endangered Species Act and other natural resource statutes.

In making these recommendations, the Marine Mammal Commission is not advocating a return to the shared jurisdiction over captive marine mammals that existed prior to 1994. Rather, we are recommending specific solutions to specific problems that have arisen since enactment of the 1994 amendments.

a. Public display

Under the 1994 amendments, there are three primary requirements that must be met by a facility holding marine mammals for purposes of public display. The facility must offer an education or conservation program based on professionally recognized standards of the public display community, be registered or licensed under the Animal Welfare Act, and be open to the public on a regularly scheduled basis. The National Marine Fisheries Service has interpreted the requirement that a facility be registered or licensed under the Animal Welfare Act as limiting the availability of public display permits to exhibits of live marine mammals and has published a regulatory definition to that effect. The Marine Mammal Commission believes that, in some instances, there may be merit to displays of

parts from dead marine mammals. For example, educational and other benefits could be provided by allowing exhibition of artifacts containing marine mammal parts made by Natives in other countries. Thus, the Commission recommends that the public display provision of the Act be broadened, or a new provision added, that would allow for the issuance of permits for the display of marine mammal parts or products. In making this recommendation, the Commission cautions that any such amendment should be narrowly drawn so as not to allow such permits to be used as a subterfuge for the importation of hunting trophies or commercial products that otherwise could not be authorized.

b. Scientific research

The key amendment to the provisions governing the issuance of scientific research permits was the addition of a general authorization for research expected to take marine mammals by Level B harassment only (*i.e.*, harassment that may disturb, but not injure, a marine mammal). It was believed that compliance with the otherwise applicable permitting requirements and procedures unnecessarily delayed research that was likely to have only minimal impacts on marine mammals and marine mammal stocks. Since its enactment, approximately 50 research projects, such as aerial surveys and photo-identification studies, have gone forward under the general authorization. One shortcoming of the existing provision, however, is that it is not available for research on marine mammals listed as endangered or threatened under the Endangered Species Act. Endangered Species Act permits are still required for these species. The Commission thinks that it would be appropriate to expand the general authorization to include those marine mammals listed under the Endangered Species Act.

Although required by statute to have promulgated regulations establishing and implementing the general authorization within 120 days of enactment of the 1994 amendments, the Fish and Wildlife Service has yet to publish a proposed rule. The National Marine Fisheries Service issued interim regulations implementing the general authorization in 1994, but has yet to finalize those regulations.

c. Exports of marine mammals

Section 104(c)(9) of the Marine Mammal Protection Act, added in 1994, specifies that no marine mammal may be exported from the United States 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. Although applicable to all three permit types, the primary focus of this amendment was on exports for purposes of public display. While the statute is clear that the comparability requirement must be met at the time of the export, there has been some debate as to whether this is a continuing obligation on the part of the receiving facility. Relying in part upon the language of section 104(c)(2)(D), which authorizes the Secretary to revoke any applicable permit and/or seize the marine mammals of any facility that no longer meets the statutory criteria applicable to public display facilities, the National Marine Fisheries Service has determined that compliance with the Marine Mammal Protection Act is a continuing obligation of the foreign facility. That is, the United States continues to exert authority over marine mammals after they are exported.

Although we concur in theory with the Service's interpretation of the applicable statutory provisions regarding exports, the Commission also believes that once a marine mammal has been delivered to a foreign country, practically speaking, control has been lost. Also, while we believe that the Service's insistence that the government of the country to which the marine mammal will be exported submit a statement indicating that it will afford comity to any enforcement action taken or permit sanction imposed by U.S. authorities is reasonable given the statutory requirements, we think it is of questionable practical value and limited effectiveness in guaranteeing the continued welfare of marine mammals once they are exported. As a practical matter, the responsible U.S. agencies do not have sufficient resources to monitor continued compliance with the comparability requirements of the Marine Mammal Protection Act once an animal has been exported. Also, it remains unclear, notwithstanding the comity statements, that enforcement actions against foreign facilities would be an effective means of achieving compliance with the Marine Mammal Protection Act. As a further complication, once a marine mammal has been exported to a foreign facility there is no available means to ensure that it is not subsequently transferred to a facility with no jurisdictional tie to the United States.

Another shortcoming of the existing system regarding exports is that comparability determinations generally are based entirely on written submissions from the facility. Although the Animal and Plant Health Inspection Service requires that these submissions be certified by the responsible foreign government, it is not clear that such certifications are based on a physical inspection of the facility. Thus, in contrast to domestic facilities, which are subject to periodic inspections to ascertain compliance with Animal Welfare Act standards, it is not apparent that foreign

facilities are even inspected in the first instance. We believe that a better method for verifying the accuracy of the information submitted by a foreign facility, and upon which a comparability determination is based, is needed.

The Marine Mammal Commission suggests that the Committee consider two possible ways in which the provisions applicable to marine mammal exports might be improved. Under both alternatives, the United States would recognize the futility of trying to retain adequate oversight of marine mammals after they have been exported to foreign facilities. Under the first approach, as a tradeoff to yielding jurisdiction over a marine mammal once it has been exported, the United States would strengthen the reliability of its comparability determination by requiring a physical inspection of the facility prior to approving an export. Any such amendment should specify that the inspection is to be conducted by an Animal and Plant Health Inspection Service inspector or an inspector trained and certified by the Service and that the cost of the inspection is to be borne by the receiving facility.

Under the second alternative, the United States would not look at the adequacy of a receiving facility at all. Rather, exports of marine mammals would be restricted to those countries that have demonstrated that they have in place a program for overseeing the welfare of captive marine mammals comparable to that established by the United States under the Animal Welfare Act. Presumably, a country, before being certified as having a comparable program, would need to demonstrate that, among other things, it has adopted minimum requirements for facility construction and other aspects of care and maintenance, that those requirements are enforced through periodic inspections, and that it has in place an effective means of preventing exports of marine mammals to facilities in other countries that did not meet certain minimum standards.

d. Educational and commercial photography

A new permit category, allowing permits to be issued to authorize educational or commercial photography was added to the Marine Mammal Protection Act by the 1994 amendments. Under the statutory provision, 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. To date, neither the National Marine Fisheries Service nor the Fish and Wildlife Service have promulgated regulations to govern the issuance of photography permits. Further in this regard, the Fish and Wildlife Service has yet to publish any revisions to its Marine Mammal Protection Act permit regulations to

reflect the substantial changes made to the Act's permit provisions in 1994. The National Marine Fisheries Service has updated some of its permit regulations, but has yet to revise its regulations to reflect the amendments pertaining to public display. We understand, however, that proposed regulations are nearly complete and should be made available for public review and comment shortly.

e. Polar bear trophies

The 1994 amendments also added a new permitting authority under which polar bear trophies may be imported from Canada. Before such imports could be authorized, the Fish and Wildlife Service, in consultation with the Marine Mammal Commission, was required to determine 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 stocks at sustainable levels, 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 Service published a finding in 1997 that allowed trophies taken from five Canadian management units to be imported into the United States. Believing that the Service had interpreted the 1994 amendment too narrowly, Congress amended the trophy provision in 1997 to clarify that polar bear trophies legally taken in Canada from any management unit prior to enactment of the 1994 amendments may be imported into the United States.

At about that same time the amendment was being considered in 1997, the Marine Mammal Commission contracted for a report to evaluate Canada's polar bear management program and consider whether the programs in place for other Canadian management units might not also meet the statutory criteria. Based on that report, the Commission recommended that findings be made for two additional management units. Final regulations allowing imports from those areas were issued by the Service earlier this year.

The 1994 amendments directed the Fish and Wildlife Service 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. That fee has been set at \$1,000 per permit and, to

date, almost \$200,000 has been collected to be used for conservation efforts.

The 1994 amendments also directed the Service to undertake a scientific review of the impact of issuing import permits on the polar bear populations in Canada. No more import permits could be issued if the review indicated that allowing polar bears to be imported into the United States is having a significant adverse effect on Canadian polar bear stocks. The review originally was to have been completed by 30 April 1996. However, regulations authorizing any imports had yet to be finalized by that date. The Service therefore indicated in its 1997 final rule that it would delay the review for two years. The Service has not yet made public the results of any review.

Prohibitions — Exports of Marine Mammals, Section 102(a)(4)

The portions of the 1994 amendments directed at the Marine Mammal Protection Act's permit provisions also included changes to the Act's prohibitions section. Section 102(a)(4) was amended to add a prohibition against exporting any marine mammal or marine mammal product taken in violation of the Act or for any purpose other than public display, scientific research, or species enhancement. The Commission agrees with the thrust of this change — exporting, as well as taking or importing a marine mammal, absent some sort of authorization, should be considered a violation of the Act. Unfortunately, the 1994 amendment was geared exclusively to the Act's permit provisions, and exports for purposes other than those recognized in section 104 were precluded. For example, the 1994 amendments added a provision allowing U.S. citizens traveling outside the United States to re-import any legally possessed marine mammal product they exported in conjunction with their travel. However, under section 102, the marine mammal item, subsequent to enactment of the 1994 amendments, could not have been legally exported in the first place. Similarly, the 1994 amendments made provision for Native inhabitants of Russia, Canada, or Greenland to import marine mammal products into the United States for non-commercial purposes in conjunction with personal travel or as part of a cultural exchange. However, no provision was included allowing them to take the marine mammal products with them when they leave.

The Marine Mammal Protection Act also recognizes other instances when exporting marine mammals or marine mammal products might be appropriate. For example, sections 101(a)(3) and 103 allow the Act's moratorium on taking and importing marine mammals to be waived in

certain instances. These provisions could be used, among other things, to authorize the commercial harvest of marine mammals. However, as section 102 was amended in 1994, products from these animals could not be exported for sales overseas. Also, there is some question as to whether exports of handicrafts made from marine mammals by Alaska Natives may inadvertently have been limited by the 1994 amendments. The Commission believes that the Act should be amended to delineate clearly that exports for such purposes are permissible.

A second, perhaps unintentional, impact of the change to section 102(a)(4) was raising the evidentiary burden when bringing enforcement actions under this provision. This provision was amended in 1981 specifically to address enforcement difficulties by clarifying that the government need not prove that the underlying taking of a marine mammal was illegal in order to proceed against individuals who are otherwise in violation of the Act. For instance, under this section as it now reads, it arguably would not be a violation to engage in the unauthorized sale of a marine mammal part if it had been legally taken in the first instance, *e.g.*, for Native subsistence. This is a potentially major loophole that was closed once and that should be closed again.

Both of the identified problems with the amendments to section 102(a)(4) appear to be unforeseen consequences of focusing entirely on the permit-related aspects of these amendments. We believe that they need to be corrected and can be corrected simply. This could be done by deleting subparagraphs (A) and (B) in section 102(a)(4) and adding clarifying language to each of the sections noted in the introductory clause of section 102(a) for which exports would be appropriate, that exports are permissible.

Definitions, Section 3

The 1994 amendments added several new definitions to the Marine Mammal Protection Act. For the most part, these definitions pertain to the new regime governing the taking of marine mammals incidental to commercial fishing operations or the revisions to the Act's permit provisions. One definition, however, has broad applicability throughout the Act — that of "harassment," which is an element of "taking." The definition was subdivided into "Level A" and "Level B" harassment. Level A harassment is defined as any 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 defined as any 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 definition, however, has created some practical difficulties related to interpretation and enforcement.

There are those who believe that certain activities, such as swimming in close proximity to wild marine mammals or releasing captive marine mammals, clearly have the potential to injure or disturb marine mammals in the wild and should be considered to be forms of harassment. On the other hand, others argue that the definition must be literally construed and that such activities fit within the scope of the definition only if they constitute an act of pursuit, torment, or annoyance. Applying a liberal reading of these requirements (*e.g.*, by characterizing an act of annoyance as anything that disturbs a marine mammal) probably would solve the problem and could be done in report language. Absent this, it may be necessary to clarify the definition by amendment. This could be done by revising the phrase "any act of pursuit, torment, or annoyance which has the potential to injure [or disturb] a marine mammal or marine mammal stock in the wild..." to read "any act which has the potential to injure [or disturb] a marine mammal or marine mammal stock in the wild...."

Imports Associated with Personal Travel and Cultural Exchanges, Section 101(a)(6)

As noted above, the 1994 amendments included provisions allowing marine mammal products to be imported into the United States for purposes of cultural exchanges or in conjunction with personal travel. Under section 101(a)(6) U.S. citizens may import marine mammal products they legally possessed and exported from the United States in conjunction with foreign travel. Also, Alaska Natives may import marine mammal items they received outside the United States as part of a cultural exchange. Similarly, Native inhabitants of Russia, Canada, and Greenland may import marine mammal products for non-commercial purposes in conjunction with travel to the United States or as part of a cultural exchange with Alaska Natives. Although not specifically required by the 1994 amendments, the Commission believes that the establishment of a registration and tracking system would be a useful means of monitoring compliance with these provisions. With respect to imports by U.S. citizens, it would provide a means of documenting that an item was legally possessed in the United States prior to export, while helping to ensure that items obtained abroad are not imported illegally. As for cultural exchanges, a tracking system would help ensure

that imported items are not impermissibly used for commercial purposes. The Commission recommends that the National Marine Fisheries Service and the Fish and Wildlife Service explore the appropriateness of developing a registration and tracking program and consider whether the benefits of such a program would outweigh the costs.

Small-Take Provisions, Section 101(a)(5)

Amendments were also made to section 101(a)(5), the Act's so-called "small-take provision," under which the taking of small numbers of marine mammals incidental to activities other than commercial fishing may be authorized if it is expected to have a negligible impact on the affected stocks and will not have any unmitigable impacts on the availability of marine mammals for Native subsistence in Alaska. Prior to the 1994 amendments, such authorizations could be issued only by regulation. In 1994, a streamlined mechanism for authorizing incidental takes by harassment for a period of up to one year, requiring public notice and opportunity for comment, but not rulemaking, was enacted. While the National Marine Fisheries Service has revised its implementing regulations to reflect these amendments, the Fish and Wildlife Service has yet to do so.

In general, the new provision has worked well and has succeeded in shortening the time required to issue authorizations. The Commission is concerned, however, that applicants are sometimes availing themselves of the streamlined authorization process by segmenting long-term activities into one-year intervals and seeking a separate authorization for each, or by seeking a separate authorization for each of several similar or related activities, which by itself has only negligible impacts. When projects are segmented this way, it often becomes difficult for the responsible agencies to assess and determine how best to avoid possible non-negligible cumulative impacts of the activities. Possible ways of addressing this problem include amending the Act to lengthen the period for which harassment-only authorizations may be issued or to require the analyses of effects to consider all related activities that may cumulatively result in more than a negligible impact.

Gulf of Maine and Bering Sea Ecosystem Studies, Section 110

Section 110 of the Act, which governs marine mammal research grants, was amended in 1994 to require the Secretary of Commerce, in consultation with the Marine Mammal Commission, adjacent coastal States, environmental organizations, the fishing industry, and other appropriate groups and individuals, to convene a regional workshop to assess human-caused factors affecting the health and stability of the Gulf of Maine marine ecosystem. The goals of the workshop were to identify such factors and to recommend a research and management program designed to restore or maintain the ecosystem. The amendment also required the Secretary to submit a report of the workshop results to Congress, including proposals for regulatory or research actions and any recommended legislative action.

Under contract to the National Marine Fisheries Service, the Regional Association for Research on the Gulf of Maine (RARGOM) held the workshop in September 1995. Based on that workshop, the Service prepared and in late 1995 transmitted to Congress its report, which identified the major human-caused stressors affecting the Gulf of Maine ecosystem and made several research and management recommendations. Among the activities identified as affecting the health and stability of the ecosystem were overfishing and certain fishing practices such as bottom trawling, which adversely affects benthic communities. The report also noted that environmental pollution, including the introduction of toxic chemicals and other contaminants from both point and non-point sources, and coastal and offshore development were having negative effects on the ecosystem.

The Service recommended that research be directed at identifying the critical linkages between contaminants and other stressors and their impacts on biologically and economically important species and habitats. The Service also indicated that management actions should be based on a precautionary principle, reflecting the level of uncertainty concerning the status of, and linkages among, various ecosystem components. Among the specific actions recommended in the report was concluding agreements with Canada for the joint management of shared fishery resources and marine mammal stocks and for controlling non-point source pollution. With respect to marine mammals, the report called for continuing efforts to identify and minimize the effects of human activities on the highly endangered northern right whale, the harbor porpoise, and pinniped species that are important components of the Gulf of Maine ecosystem.

Another provision added to section 110 in 1994 required the Secretary of Commerce, in consultation with the Secretary of the Interior, the Marine Mammal Commission, the State of Alaska, and Alaska Native organizations 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. The Secretary of Commerce, the Secretary of the Interior, and the Marine Mammal Commission were directed to include discussions of the status and findings of this research program in their annual reports to Congress.

In furtherance of this requirement, the National Marine Fisheries Service prepared and in 1995 circulated to the Commission and others a draft Bering Sea ecosystem study plan. Although the Commission commented on the draft plan and a workshop to discuss the plan was held, the plan was never finalized. Nevertheless, much of the anticipated research has gone forward or is in the process of being funded through the North Pacific Marine Research Initiative administered by the University of Alaska.

Polar Bear Agreements, Section 113

In addition to the inclusion of the permit provision for polar bear trophies discussed above, other amendments enacted in 1994 addressed issues specific to this species. 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, section 113 of the Marine Mammal Protection Act was amended to require the Secretary of the Interior to conduct two reviews. Section 113(b) was added to require the Secretary, in consultation with the other contracting parties, to review the effectiveness of the Agreement. Also, the Secretary was directed to work with the contracting parties to establish a process by which future reviews of the Agreement will be conducted. The Fish and Wildlife Service has initiated this review and has received submissions from all but one of the other parties. A report setting forth the Service's conclusions will be prepared once all of the parties have responded and the submissions have been analyzed.

The 1994 amendments also added section 113(c), which directed the Secretary, in consultation with the Secretary of State and the Marine Mammal Commission, to undertake a review of domestic implementation of the Polar Bear Agreement, with special attention to be given to the habitat protection mandates of the Agreement. A report on the results of that review was to be submitted to Congress by 1 April 1995.

The Service convened a workshop in 1995 to review U.S. implementation of the Agreement and, based on the results of that meeting, circulated a draft report in 1996. The report identified certain areas in which the provisions of U.S. law needed to be reconciled with those of the treaty. For example, the draft report noted that, although the Agreement and resolutions adopted by the parties to the Agreement prohibit airborne hunting and the taking of cubs, female bears with cubs, and denning bears, the Marine Mammal Protection Act exemption for taking by Alaska Natives contains no such limitations. As noted by the Service in the draft report, however, these issues had been addressed for the Beaufort Sea polar bear population through a Native-to-Native agreement entered into by Alaska's North Slope Borough and Canada's Inuvialuit Game Commission. Similarly it was believed that these issues could be addressed satisfactorily for the Bering Sea-Chukchi Sea polar bear population through a bilateral agreement being negotiated with the Russian Federation. Although the report apparently is close to completion, it needs to be completed and transmitted to Congress.

The 1994 amendments also called on the Secretary of the Interior, acting through the Secretary of State and in consultation with the Marine Mammal Commission and the State of Alaska, to consult with appropriate Russian officials in an effort to develop and implement enhanced cooperative research and management programs for conserving the shared population of polar bears. A report on the consultations and periodic progress reports on research and management actions taken under this provision are to be provided to Congress.

In furtherance of this directive, United States officials entered into negotiations with their Russian counterparts in an effort to conclude a bilateral polar bear agreement. The two delegations reached an *ad referendum* agreement in February 1998, setting forth the text of the bilateral agreement. Formal adoption of the agreement, however, is awaiting official approval by the respective governments. Following signature, the agreement will be forwarded to the Senate for its advice and consent. It is expected that the United States will need to enact implementing legislation. This being the case, it makes sense to defer making any amendments to U.S. law relative to the U.S.-Russian agreement or that may be needed to reconcile U.S. law with the terms of the multilateral Agreement on the Conservation of Polar Bears until the bilateral agreement has been concluded.

Co-Management Agreements, Section 119

Section 119 was added to the Act to authorize funding for and to encourage development of cooperative agreements between the National Marine Fisheries Service and the Fish and Wildlife Service and Alaska Native organizations designed to conserve marine mammals and provide co-management of subsistence use by Alaska Natives. Under such agreements, the Services 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 were authorized for establishing such agreements and providing such grants.

The Fish and Wildlife Service has aggressively pursued co-management agreements for the three Alaska marine mammal species under its jurisdiction. Beginning in 1997, the Service sought and received an annual appropriation of \$250,000 specifically earmarked for co-management activities. Using these funds, the Service has entered into agreements with Alaska Native organizations and supported cooperative activities for polar bears, sea otters, and walrus. The Fish and Wildlife Service has also instituted a marking and tagging program, as authorized by section 109(i) of the Act, to obtain reliable information on the numbers, ages, sex, and condition of polar bears, sea otters, and walrus being taken by Native hunters.

The National Marine Fisheries Service, too, is moving forward to conclude co-management agreements for species under its jurisdiction. Earlier this year, the Service entered into an agreement with the Alaska Harbor Seal Commission to develop an action plan for harbor seals in Alaska. The Commission understands that the Service is also working with Native organizations on agreements for fur seals, Steller sea lions, and beluga whales. Although the National Marine Fisheries Service has not sought specific funding under section 119, its budget for fiscal year 1999 contains a specific line item of \$750,000 to support the activities of various Native organizations involved in marine mammal management.

While the Marine Mammal Commission is encouraged by the actions being taken by the National Marine Fisheries Service to work cooperatively with Native organizations to

conserve and manage several marine mammal species, we are concerned that, in some cases, the Service still lacks basic information on the level of taking from the various stocks. In this regard, the Marine Mammal Commission has recommended that the Service institute a marking and tagging program akin to that established by the Fish and Wildlife Service to obtain reliable information on the marine mammals under its jurisdiction being taken by Alaska Natives for subsistence and handicraft purposes. The Commission believes that establishment of such a program is important and suggests that Congress consider ways in which action by the Service might be encouraged.

The National Marine Fisheries Service has been pursuing a co-management agreement with the Cook Inlet Marine Mammal Council in an effort to stem the serious overharvest of beluga whales from the Cook Inlet population. To date, those efforts have proved unsuccessful because not all hunters have been willing to commit voluntarily to harvest limits and because the Council is unable to exercise jurisdiction over the hunters. This experience points out a general shortcoming with the existing co-management system. Co-management agreements, to the extent that they are intended to regulate or limit subsistence taking, will be successful only if all hunters voluntarily abide by those limits or the Native organization entering into the agreement can effectively exert control over all Native hunters, such as is the case with the Alaska Eskimo Whaling Commission. While Alaska Natives traditionally have demonstrated a willingness to act responsibly in conserving marine mammals and other resources, the recent experience with Cook Inlet belugas demonstrates the delicate underfooting that exists. For some marine mammals, all it takes is a few hunters refusing to act responsibly to put a stock at risk. The Commission therefore recommends that Congress consider ways in which the co-management provisions of the Marine Mammal Protection Act might be strengthened to provide effective enforcement mechanisms for agreements entered into between the responsible Federal agencies and Native organizations.

For the time being, the situation with respect to Cook Inlet beluga whales has been addressed by a free-standing amendment enacted as part of Public Law 106-31, the 1999 Emergency Supplemental Appropriations Act. Section 3002 of that Act specifies that, until 1 October 2000, the taking of a beluga whale from the Cook Inlet stock will be lawful only if it occurs pursuant to a cooperative agreement between the National Marine Fisheries Service and the affected Alaska Native organizations. While this amendment has given a push for concluding a co-management agreement and has given any such agreement the needed teeth to make it enforceable, it is unclear what will happen

after the provision lapses in October 2000. Unless the provision is extended legislatively, co-management agreements in general are made more enforceable, the commercial incentive behind the beluga whale hunt is eliminated, or the Service completes a formal rulemaking under section 101(b) to regulate Native harvest from this stock, we may be faced with a similar conservation problem 15 months from now when the provision in Public Law 106-31 expires.

Other Amendments

Other amendments enacted in 1994 1) clarified and strengthened the Act's general policy regarding habitat protection and specifically authorized conservation and management measures for alleviating 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, 2) authorized the taking of a marine mammal when "imminently necessary" in self-defense or to save the life of another person in immediate danger, 3) established a heightened evidentiary standard for certain actions or findings affecting species taken by Alaska Natives, 4) negated special regulations applicable to areas in Hawaii where humpback whale cow/calf pairs commonly occur, and 5) extended 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. No specific actions to implement these provisions were required.

Authorization of Appropriations

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 were set at \$12,138,000 in fiscal year 1994 and increased in each subsequent year to \$14,768,000 in fiscal year 1999. The amendments also authorized 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 sections 117 and 118, the new fisheries incidental take regime. Appropriations for the Department of the Interior authorized by section 116(b) ranged 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 were set at \$1,500,000 in fiscal year 1994 and increased incrementally to \$1,750,000 in fiscal year 1999.

The Commission recommends that the Marine Mammal Protection Act be amended to authorize appropriations for the Department of Commerce, the Department of the Interior, and the Marine Mammal Commission for a five-year period.

Other Possible Amendments

In addition to the recommendations provided above, the Commission believes that certain provisions of the Act need to be updated to reflect economic changes since they were enacted in 1972. For example, the penalties established under section 105 and the fines that may be levied under section 106 have never been increased. While substantial in 1972, they now may be viewed by some potential violators as no more than an acceptable cost of doing business. Similarly, section 206(4) authorizes the Marine Mammal Commission to procure the Service of outside experts and consultants, but limits the amount of compensation to \$100 per day. This provision needs to be updated to reflect prevailing rates for such services.

As a more general issue, the Commission notes that most research and conservation actions are undertaken in response to acute, often controversial, conservation issues. Agency mandates, budgets, and programs largely reflect this reactive approach to resource conservation. Nevertheless, the agencies responsible for marine mammal programs recognize the desirability of anticipating problems and taking steps to prevent such situations from developing in the first place and are trying to move in that direction. For example, the Commission, along with the National Marine Fisheries Service, the U.S. Geological Survey, and the Environmental Protection Agency, recently convened a meeting of international experts to identify and provide advice on resolving uncertainties concerning the possible effects of persistent ocean contaminants on marine mammals. The Commission recommends that Congress consider the need for broad-based, interdisciplinary, anticipatory research that will allow the government to take action to address potential issues before they become serious problems.

