MARINE MAMMAL COMMISSION

Annual Report to Congress

1992

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

31 January 1993

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Page 55, Column 2, Second Complete Paragraph: The third sentence should read as follows:

> "Inuvialuit hunters subsequently struck and killed one bowhead whale in 1991."

EXECUTIVE SUMMARY

This is the 20th 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 to provide an independent source of guidance on Federal activities and policies, both domestic and international, affecting marine mammal protection and conservation. Members of the Commission, its Committee of Scientific Advisors, and staff in 1992 are listed in Chapter I as is information on recent funding levels.

The purpose of the Annual Report is to provide timely information on important marine mammal conservation issues and events to Congress and to responsible Federal and state agencies, public interest groups, the academic community, private citizens, and the international community. When combined with previous reports, it provides a historical record with which to track and evaluate progress in identifying and resolving issues related to the conservation of marine mammals. To ensure factual accuracy, the report is provided to relevant Federal and state agencies and other involved parties for review and comment prior to publication. A brief review of the report's contents is provided below.

Amendments to the Marine Mammal Protection Act (Chapter II)

Congress periodically reviews the Marine Mammal Protection Act in light of past experience and perceived needs. The reviews are often part of the Congressional process to reauthorize the legislation. At the last such review in 1988, Congress reauthorized the Act through 30 September 1993. The major amendments of 1988, those enacted in 1992, and the major issue to be raised during reauthorization in 1993 are described in this chapter.

Species of Special Concern (Chapter III)

Each year, the Marine Mammal Commission and its Committee of Scientific Advisors devote particular attention to marine mammal species or populations that are or may be in jeopardy. Chapter III describes efforts to conserve: sea otters in California and Alaska; Steller sea lions; Hawaiian monk seals; harbor seals; northern fur seals; Pacific walruses; northern right whales; humpback whales; gray whales; bowhead whales; harbor porpoises; vaquitas or Gulf of California harbor porpoises; bottlenose dolphins; killer whales; and polar bears. Activities related to West Indian manatees, Hawaiian monk seals, vaquitas, and gray whales are summarized below.

West Indian Manatees — The manatee population in Florida and Georgia is one of the most endangered marine mammal populations in United States waters. It continues to

be placed in jeopardy as a result of animals being struck and killed by boats and the degradation of critical habitat. In the past five years, the U.S. Fish and Wildlife Service and the Florida Department of Natural Resources, with help from numerous other Federal and state agencies and private groups, have greatly increased manatee protection and recovery efforts. Particular attention is being given to establishing effective boat speed regulations and controlling development in essential manatee habitat.

In 1992, the Commission and its Committee of Scientific Advisors met in Florida and thoroughly reviewed the Federal and State manatee recovery programs. The review indicated that principal needs are being addressed aggressively and that the recovery program continues to become more effective each year. Although it is too soon to know if changes recently put in place are responsible, vessel-related manatee mortality declined 28 percent in 1992 from 1991 levels — the largest decline since reliable records on causes of manatee deaths were first collected in 1978.

Hawaiian Monk Seals — The Hawaiian monk seal, the most endangered seal in U.S. waters, now occurs almost entirely on and around the small, largely uninhabited atolls and islands northwest of the main Hawaiian Islands. Most areas where the species comes ashore to rest and pup are in the Hawaiian Islands National Wildlife Refuge administered by the Fish and Wildlife Service. Counts of monk seals declined by half between the late 1950s and early 1980s, increased slightly in the mid-1980s, and began declining again in the late 1980s. Threats to this species differ from island to island; they include human disturbance, insufficient food, interactions with commercial fisheries, and mobbing attacks on adult females and juveniles by aggressive males attempting to mate.

To address the threats, the National Marine Fisheries Service, with help from the Fish and Wildlife Service, began efforts to rebuild certain populations by relocating pups to increase their chances of survival, by prohibiting longline fishing near monk seal habitat, and by developing a program to try to identify the cause of and prevent mobbing behavior. Since getting adequate support for these efforts and other recovery tasks has been difficult, the Commission held a comprehensive program review in late 1991 to identify issues which should be afforded high priority.

Several key recovery efforts depend on maintaining the integrity of Tern Island. This island, with its strategically vital runway, lies roughly at the mid-point of the Archipelago and is the Fish and Wildlife Service's only permanently occupied field station in the Hawaiian Islands National Wildlife Refuge. Unfortunately, the seawall protecting the island is now disintegrating and the buildings and runway are threatened. The initially encouraging start that was made in 1991 to plan repairs to save the island was not followed by great progress in 1992.

Vaquitas — Perhaps the most endangered small cetacean in the world is the vaquita or Gulf of California harbor porpoise. This small porpoise occurs in the northern Gulf of California, or Sea of Cortez, and may number only a few hundred animals. Vaquitas are

taken incidentally by commercial fishermen in gillnets, including nets set illegally to catch an endangered species of fish called the totoaba. Totoaba fillets are exported illegally for sale in United States markets, and this practice helps to sustain the fishery in which vaquitas are incidentally killed.

In response to Marine Mammal Commission recommendations in 1991, the National Marine Fisheries Service, in 1992, developed a technique to biochemically distinguish totoaba fillets from closely related species. Then, in cooperation with the Fish and Wildlife Service, the Service strengthened enforcement efforts to interdict illegal totoaba imports. Also in 1992, the President of Mexico established a special committee to determine what must be done to protect vaquitas and totoabas. In support of this effort, the Commission made funds available to assist Mexican scientists in developing a recovery plan for vaquitas.

Gray Whales — Both the eastern and the western North Pacific stocks of gray whales were nearly eliminated by commercial whaling. The eastern, or California stock, migrates between breeding and calving lagoons in Mexico's Baja California Peninsula and feeding grounds off Alaska and Siberia. A ban on commercial exploitation of gray whales was adopted in the 1940s and, in the 1970s, gray whales were listed as endangered under the Endangered Species Act. Since then, the eastern stock has increased to about 24,000 animals, a number approaching, if not equaling, its pre-exploitation size.

In 1991, the National Marine Fisheries Service proposed removing the species from the endangered list. While the stock has increased, so too have human activities which threaten vital habitats. Since protection under the Endangered Species Act has helped minimize these threats, the Commission urged that the Service consider carefully the effects of reduced protection for gray whales. Late in 1992, the Service concluded that the protection afforded by being listed was no longer necessary, and decided to recommend removal of the California stock of gray whales from the List of Endangered and Threatened Species. The action marks the first time a marine mammal species or population listed as endangered or threatened has been determined to have recovered to a point where protection under the Endangered Species Act is no longer required. The Service will continue to monitor the stock to assess the effect of its action. The western stock, which has not recovered, will remain listed.

Marine Mammal-Fisheries Interactions (Chapter IV)

Marine mammals affect and are affected by many commercial fisheries. Among other interactions, marine mammals may be caught and killed in fishing gear, remove caught fish from nets and lines, damage fishing gear, and compete with fishermen for the same fish resources. The incidental take of marine mammals in commercial fisheries is currently authorized under a five-year interim exemption from the Marine Mammal Protection Act's general permit and "small take" provisions.

The interim exemption expires on 1 October 1993. In December 1992, the National Marine Fisheries Service provided Congress a proposed regime to govern interactions between marine mammals and commercial fisheries after 1 October 1993. It is expected that Congress will examine the issue and, as appropriate, act upon the Service's proposal in 1993. The proposed regime and actions taken by the Commission to further its development are discussed in this chapter.

The interim exemption does not apply to the eastern tropical Pacific tuna purse seine fishery for yellowfin tuna. Actions taken to reduce and eliminate dolphin mortality incidental to that fishery are also discussed.

Since the mid-1970s, there have been alarming declines in populations of northern fur seals, Steller sea lions, harbor seals, and certain species of sea birds in parts of the Bering Sea and Gulf of Alaska. Efforts to assess and describe the causes of these declines are also discussed in this chapter.

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

The Marine Mammal Protection Act directs the Commission to review and provide advice to the Secretary of State and other Federal officials on international arrangements affecting marine mammals and their habitat. In 1992, relevant Commission activities focused on completing a reference volume of treaties and international agreements, the regulation of whaling by the International Whaling Commission, high seas driftnet fisheries, and conservation of marine mammals and their habitat in the Southern Ocean.

Compendium of Treaties and International Agreements — While cooperative international efforts to protect the environment, including marine life and habitat, are usually based upon the provisions of treaties or other international agreements, there is no recent compendium of these and related documents. To address this deficiency, the Marine Mammal Commission began work in mid-1991 to compile, with the help of an outside Advisory Board, a compendium of documents bearing on environmental protection with an emphasis on marine matters. Work continued through 1992 and the compendium will be published in mid-1993. It will include full texts of more than 375 documents, including more than 175 treaties and agreements. Many agencies and organizations, particularly the Bureau of Oceans and International Environmental and Scientific Affairs and the Treaty Affairs Office of the Department of State, have provided valuable advice and support.

Commercial Whaling — The International Whaling Commission (IWC) is responsible for the international regulation of commercial whaling. Because regulation was ineffectual for so many years, most exploited whale stocks were reduced to dangerously low levels. In 1986, an IWC moratorium on commercial whaling took effect; the moratorium was to allow stocks to recover and to provide time to review management practices. Since 1986, the IWC's Scientific Committee has conducted a comprehensive assessment of

selected whale stocks and has developed a revised management procedure. Some countries now advocate resuming commercial whaling on stocks which they maintain can safely sustain such taking.

The Marine Mammal Commission reviewed issues related to the operation of the IWC and, late in 1991, recommended to the U.S. Commissioner to the IWC that no consideration be given to lifting the moratorium on commercial whaling until, at a minimum, certain specified conditions are met. The Commission also recommended that the United States continue to oppose resumption of commercial whaling on the basis of previous failures to prevent over-exploitation, failure to consider the non-consumptive, as well as the consumptive, values of whales, and the importance of whales as a component of marine ecosystems. The Marine Mammal Commission provided further comments to the U.S. Commissioner to the IWC in 1992. The IWC continued work in 1992 to complete a revised management scheme for regulating commercial whaling, but took no action to lift the moratorium.

High Seas Driftnet Fishing — The unregulated, incidental catch of large numbers of many marine species has made large-scale high seas driftnet fishing a matter of great international concern. This non-selective fishing technique reaps such a substantial bycatch that it threatens not only individual species and populations, but also the fundamental structure of pelagic marine ecosystems. To gather data on catch levels and reduce levels of incidental take of marine resources of United States origin, Congress directed in 1987 that driftnet monitoring and enforcement agreements be negotiated with nations engaging in driftnet fishing in the North Pacific Ocean. Agreements, designed in part to generate statistically reliable catch data, were negotiated with Japan, Taiwan, and the Republic of Korea. As noted in past annual reports, the Commission questioned the adequacy of the monitoring programs established under these agreements; it also has advocated banning large-scale pelagic driftnet fishing.

In December 1991, thanks largely to efforts by the State Department and the National Oceanic and Atmospheric Administration, the United Nations General Assembly adopted a Resolution calling for a 50 percent reduction in large-scale pelagic driftnet fishing effort by 30 June 1992 and an indefinite cessation of all such fishing after 31 December 1992. Although the Resolution is non-binding, driftnet fishing nations took steps in 1992 to comply with its provisions and to suspend large-scale driftnet fishing on the high seas by 1993. Also in 1992, a member of the Commission's Committee of Scientific Advisors reviewed catch data from the driftnet monitoring programs. The results suggest that observer levels in this and certain other fisheries may be too low to estimate incidental catch levels with the required degree of accuracy.

Marine Mammals in the Southern Ocean — More than 13 species of whales and seals occur in the seas surrounding Antarctica. Many of these species have been depleted by commercial exploitation; they may be further affected, both directly and indirectly, by ongoing fisheries development and other activities. The Antarctic Treaty Parties have

recognized that fisheries and other activities could have adverse effects, and have concluded agreements to regulate such activities. Actions taken in 1992 to implement the provisions of these agreements and of the Antarctic Treaty are described in this chapter. Of particular note is the Antarctic Treaty Protocol on Environmental Protection which was concluded in 1991. When it enters into force, the Protocol will establish general governing principles and set forth legally binding obligations to protect the Antarctic environment. It also will prohibit mineral resource exploration and development for at least 50 years.

The Protocol will not enter into effect until it has been ratified by all 26 Antarctic Treaty Consultative Parties. The Commission believes that, if the United States acts promptly to pass effective implementing legislation, other Antarctic Treaty Consultative Parties will follow suit. Therefore, in 1993, the Commission will continue to work through the Interagency Working Group on the Antarctic to develop and seek passage of effective implementing legislation.

Marine Mammal Strandings and Die-Offs (Chapter VI)

Since the late 1970s, the number of unusual marine mammal mortality events has increased. Among the largest and most publicized have been the deaths of more than 700 bottlenose dolphins on the United States east coast in 1987-1988, more than 17,000 harbor seals in the North Sea in 1988, and more than 1,000 striped dolphins in the Mediterranean Sea in 1990-1991. The causes of these and other unusual mortality events included viral and bacterial diseases, pollution, naturally occurring biotoxins, and environmental changes.

Three unusual marine mammal mortality events occurred in the United States in 1992. These involved bottlenose dolphins along the Texas coast, sea lions and other pinnipeds in central California, and harbor seals in Oregon and Washington. Also, there were indications that a phocine distemper virus, similar to that which caused the harbor seal deaths in the North Sea in 1988, was found for the first time in harbor seals in United States waters.

To be better prepared to assess and respond to future die-offs, the National Marine Fisheries Service continued to strengthen its regional marine mammal stranding networks and to develop its marine mammal tissue bank. Also in 1992, Congress passed the Marine Mammal Health, Response, and Stranding Act. The Act, which amends the Marine Mammal Protection Act, directs the National Marine Fisheries Service to develop, and prepare to implement, a plan to respond to unusual mortality events.

Impacts of Marine Debris (Chapter VII)

Many marine mammals, including some that are endangered or threatened, are injured or killed by entanglement in or ingestion of discarded nets, lines, strapping bands, and other debris. In the early 1980s, the Commission precipitated domestic and international action to address this form of pollution; it has remained involved since then.

In 1992, the Commission reviewed plans for the 1993 Marine Entanglement Research Program of the National Marine Fisheries Service and helped begin planning for the Third International Conference on Marine Debris to be held in 1994. In 1992, the Marine Environment Protection Program of the International Maritime Organization continued to revise and update its guidelines on port reception facilities for ship-generated garbage. This work, first recommended by the Marine Mammal Commission, is now receiving support from the National Marine Fisheries Service and the Coast Guard. Cooperative international efforts to develop a plan to address marine debris in the wider Caribbean as part of the Caribbean Environment Program of the United Nations are discussed in this chapter, also.

Marine Mammal Management in Alaska (Chapter VIII)

Marine mammal research and management activities in Alaska are substantial and complex. This is because of the many species, the large size of some populations, marine mammal use by Alaska Natives for subsistence and handicrafts, interactions with commercial fishing and offshore oil and gas exploration and development, and shared jurisdiction of some populations with Russia and Canada. To provide the basis for developing effective conservation plans, the Commission published, in 1988, ten species accounts with research and management recommendations. More recently, the Commission has provided the Fish and Wildlife Service draft conservation plans for walruses, polar bears, and sea otters and has made recommendations to the National Marine Fisheries Service on development and implementation of the Steller Sea Lion Recovery Plan. Commission involvement in these and related activities are described in this chapter.

Outer Continental Shelf Oil and Gas Development (Chapter IX)

The Minerals Management Service, the Fish and Wildlife Service, and the National Marine Fisheries Service share responsibility for ensuring that activities and oil spills associated with offshore oil and gas exploration and development do not have significant adverse effects on marine mammals or their habitat. In 1992, the Marine Mammal Commission commented to the Minerals Management Service on Draft Environmental Impact Statements for three proposed offshore lease sales. It also commented to the Fish and Wildlife Service and the National Marine Fisheries Service on actions under section 101(a)(5) of the Marine Mammal Protection Act to authorize the incidental take of certain marine mammals in Alaska during the course of planned oil and gas exploration activities. Under this section, small numbers of marine mammals, including endangered and threatened species, may be taken unintentionally during such activities if the take would have a negligible impact on the species, and if the industry institutes a monitoring program to verify that effects are negligible.

Research and Studies Program (Chapter X)

The Marine Mammal Protection Act calls upon the Commission to undertake, or cause to be undertaken, studies which it considers necessary or desirable to protect and

conserve marine mammals. To this end, the Commission supports its own research program, makes recommendations to other agencies on appropriate research, and ensures that results of its studies are published. Research-related activities under taken by the Commission in 1992 are discussed in this chapter.

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

The Marine Mammal Protection Act provides that the Departments of Commerce and the Interior may issue permits to authorize the taking of marine mammals for purposes of scientific research, public display, and enhancing the survival or recovery of marine mammal populations or stocks. Actions taken in 1992 that relate to permits are discussed in this chapter.

Marine Mammals in Captivity (Chapter XII)

The National Marine Fisheries Service, the Fish and Wildlife Service, and the Animal and Plant Health Inspection Service all have certain responsibilities bearing on the handling, care, treatment, and transportation of captive marine mammals. Among the most pressing issues now before them are the revision of the Animal and Plant Health Inspection Service's regulations governing the care of captive marine mammals. In this chapter, these and related matters are discussed.

Appendices

Three Appendices follow the report. Appendix A summarizes recommendations made by the Marine Mammal Commission in 1992; Appendix B lists reports from Commission-sponsored studies available through the National Technical Information Service; and Appendix C lists reports or papers resulting from Commission-sponsored work that have been published elsewhere.

Chapter I

INTRODUCTION

This is the 20th Annual Report of the Marine Mammal Commission, covering the period 1 January through 31 December 1992. It is being submitted to Congress pursuant to section 204 of the Marine Mammal Protection Act of 1972.

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

Personnel

The Commission consists of three part-time Commissioners appointed by the President. The Marine Mammal Protection Act requires that the Commissioners be knowledgeable in marine ecology and resource management. At the end of 1992, the Commissioners were: John E. Reynolds, III, Ph.D., (Chairman), Eckerd College, St. Petersburg, Florida; Paul K. Dayton, Ph.D., Scripps Institution of Oceanography, La Jolla, California; and Jack W. Lentfer, Homer, Alaska.

The Commission's full-time staff members are: John R. Twiss, Jr., Executive Director; Robert J. Hofman, Ph.D., Scientific Program Director; David W. Laist, Policy and Program Analyst; Michael L. Gosliner, General Counsel; Gregory K. Silber, Ph.D., Deputy Scientific Program Director; Richard L. Wallace, Special Assistant to the Executive Director; Anne K. Kiley, Administrative Officer; Alison G. Kirk, Permit Officer; Eileen C. Shoemaker, Staff Assistant in charge of publications; and Darel E. Jordan and Susan E. Holcombe, Staff Assistants.

The Commission Chairman, with the concurrence of the other Commissioners, appoints persons to the nine-member Committee of Scientific Advisors on Marine Mammals. Committee members are required by statute to be scientists who are knowledgeable in marine ecology and marine mammal affairs. At the end of 1992, its members were: William F. Perrin, Ph.D., (Chairman), National Marine Fisheries Service, La Jolla, California; Douglas G. Chapman, Ph.D., Seattle, Washington; Murray L. Johnson, M.D., Burke Museum, University of Washington, Seattle; Burney J. Le Boeuf, Ph.D., University of California, Santa Cruz; Lloyd F. Lowry, Alaska Department of Fish and Game, Fairbanks; Marc Mangel, Ph.D., University of California, Davis; William Medway, D.V.M., Ph.D., University of Pennsylvania, Philadelphia; Thomas J. O'Shea, Ph.D., U.S. Fish and Wildlife Service, Fort Collins, Colorado; and Tim D. Smith, Ph.D., National Marine Fisheries Service, Woods Hole, Massachusetts.

In recognition of the importance of marine mammals in the lives of many Eskimos, Indians, and Aleuts, Matthew Iya of Nome, Alaska, serves 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 1989, $953,000; FY 1990, $960,000; FY 1991, $1,153,000; FY 1992, $1,250,000; and FY 1993, $1,260,000.

Chapter II

THE MARINE MAMMAL PROTECTION ACT AND RELATED LEGISLATION

The Marine Mammal Protection Act was originally enacted in 1972. Since then, the Act has been reauthorized and amended several times, most recently in 1988. The Act is due to be reauthorized in 1993.

1988 Amendments to the Marine Mammal Protection Act

In addition to reauthorizing the Marine Mammal Protection Act through Fiscal Year 1993, the 1988 legislation amended several provisions of the Act. Foremost among the amendments was the enactment of a five-year interim exemption from the Act's prohibition on taking marine mammals, which authorizes the taking of marine mammals incidental to commercial fishing operations. Implementation of the interim exemption and efforts to develop a new regime for governing the incidental taking of marine mammals when the interim exemption expires on 1 October 1993 are discussed in Chapter IV.

The Act's provisions governing the taking of marine mammals incidental to the eastern tropical Pacific tuna fishery were also amended in 1988. The amendments placed additional restrictions on U.S. fishermen participating in the fishery and strengthened the comparability requirements for fishermen from other countries that export yellowfin tuna to the United States. Implementation of the amendments with respect to the tuna fishery are also discussed in Chapter IV.

Another amendment enacted in 1988 created a new permit category for activities designed to enhance the survival or recovery of a marine mammal species or stock. Provisions applicable to scientific research and public display permits were also amended. Implementation of the amendments is discussed in Chapter XI.

In addition, the 1988 amendments added a new section to the Act, setting forth procedures for reviewing the status of marine mammal populations and for making depletion determinations. The new section also requires the preparation of conservation plans for any species or stock designated as depleted unless it is determined that such a plan will not promote the conservation of the species or stock. The Secretary of Commerce was specifically directed to prepare a conservation plan for northern fur seals by 31 December 1989 and one for Steller sea lions by 31 December 1990. Status determinations for particular species and steps taken to prepare conservation plans are discussed in Chapters III and VIII.

1992 Amendments to the Marine Mammal Protection Act

Four laws enacted in 1992 amended provisions of the Marine Mammal Protection Act. Public Law 102-251, enacted on 9 March 1992, implements the Maritime Boundary Agreement between the United States and the Union of Soviet Socialist Republics, which settled a boundary dispute regarding national jurisdiction in the Bering Sea. The amendment to the Act modifies the definition of "waters under the jurisdiction of the United States."

The International Dolphin Conservation Act of 1992, Public Law 102-523, was enacted on 26 October 1992. That Act adds a new Title III to the Marine Mammal Protection Act. As discussed in Chapter IV, the Act calls upon the Secretary of State, in consultation with the Secretary of Commerce, to negotiate international agreements to establish a global moratorium on the practice of setting purse seine nets on dolphins and other marine mammals in order to catch tuna. Nations that enter into and abide by such

agreements will not be subject to the tuna embargo that may otherwise be applicable. The Act requires U.S. tuna fishermen to cease the practice of setting on dolphins effective 1 March 1994 if any major tuna fishing nation commits to the moratorium on marine mammals sets, or effective 31 December 1999 if no such commitment is made. The Act also reduces the allowable quota of animals that may be taken by U.S. fishermen in the tuna fishery to 1,000 in 1992 and 800 during the period from 1 January 1993 to 28 February 1994. In addition, after 1 June 1994 it will be illegal to purchase or sell any tuna or tuna product in the United States that is not "dolphin safe."

Public Law 102-582, the High Seas Driftnet Fisheries Enforcement Act, was enacted on 2 November 1992. As discussed in Chapter V, the Act focuses on strengthening U.S. efforts to implement the United Nations moratorium on high seas driftnet fishing. The Act also amends the Marine Mammal Protection Act by defining "intermediary nations" that may be subject to secondary tuna embargoes.

The Oceans Act of 1992 was enacted as Public Law 102-587 on 4 November 1992. Title III of the Oceans Act, the Marine Mammal Health and Stranding Response Act, amends the Marine Mammal Protection Act by adding a new Title III.[1] These amendments, which include the establishment of a Marine Mammal Health and Stranding Response Program and formalization of the National Marine Mammal Tissue Bank, are discussed in Chapter VI.

While it did not amend the Marine Mammal Protection Act, the National Oceanic and Atmospheric Administration Authorization Act of 1992, Public Law 102-567, also contains provisions relating to marine mammals. Section 302 of the Act specifies that, in each of Fiscal Years 1992 and 1993, $1 million is to be appropriated for the purpose of developing dolphin-safe methods of locating and catching yellowfin tuna. This provision is discussed in Chapter IV. Section 306 of the Act directs the Secretary of Commerce to conduct a study of the effects of feeding wild dolphins. This provision is discussed in Chapter XI.

Reauthorization of the Marine Mammal Protection Act and Related Statutes

As noted above, the Marine Mammal Protection Act was reauthorized in 1988 for a five-year period. As such, the Act will be up for reauthorization in 1993, and hearings are expected in the spring.

During the reauthorization process, much attention is likely to be focused on a new regime to govern the taking of marine mammals incidental to commercial fishing operations. The interim exemption that currently governs such taking expires on 1 October 1993. Unless Congressional action is taken before then, marine mammal-fisheries interactions will once again be governed by the general permit and small-take provisions of the Marine Mammal Protection Act. As was the case in 1988 when the interim exemption was enacted, there is concern that some fisheries may be unable to obtain authority to take marine mammals under those provisions. As noted above and discussed in Chapter IV, on 4 December 1992 the National Marine Fisheries Service, submitted to Congress its recommendation for a new incidental taking regime. It is expected that the Service's proposal will be the starting point for considering this issue during the reauthorization process.

Reauthorization of the Endangered Species Act (originally scheduled for hearings in 1992) and the Magnuson Fishery Conservation and Management Act is expected to be considered by Congress during the 1993 legislative session.

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1 As enacted, both the International Dolphin Conservation Act of 1992 and the Oceans Act of 1992 added a new Title III to the Marine Mammal Protection Act. The first Title III, the Global Moratorium to Prohibit Certain Tuna Harvesting Practices, has been codified at 16 U.S.C. §§ 1411-1418. The second Title III, Marine Mammal Health and Stranding Response, has been codified at 16 U.S.C. §§ 1421-1421h. Technical amendments are expected in the 1993 reauthorization to correct this duplication.

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 that should be taken to protect marine mammals. To help meet this charge, the Commission devotes special attention to species, populations, or habitats that are particularly vulnerable. Species of special concern may include marine mammals listed as endangered or threatened under the Endangered Species Act (Table 1), as well as others.

During 1992 special attention was directed to some of the endangered or threatened species in U.S. waters and to others that are either in other countries' waters or are shared with other countries. These included West Indian manatees, California (southern) sea otters, Hawaiian monk seals, Steller sea lions, northern right whales, humpback whales, bowhead whales, gray whales, and vaquitas (Gulf of California harbor porpoises). Special attention also was devoted to other U.S. species or populations not listed but faced with serious problems. Among these are sea otters in Alaska, harbor seals, northern fur seals, Pacific walruses, harbor porpoises, bottlenose dolphins, killer whales, and polar bears.

West Indian Manatee (*Trichechus manatus*)

The West Indian manatee is one of the most endangered marine mammals in the United States. It was among the first species so listed under the Endangered Species Preservation Act of 1966, a predecessor to the Endangered Species Act of 1973. In the United States, manatee populations occur in the southeastern states — primarily in Florida and Georgia — and in Puerto Rico. In the southeastern states, manatees are recognized as a separate subspecies, *T. manatus latirostris*, also called the Florida manatee. The manatee population in Puerto Rico, estimated to number perhaps 100 animals, belongs to the only other recognized subspecies, *T. manatus manatus*, also called the Antillean manatee.

The manatee population in the southeastern United States is the largest known group anywhere in the species' range. Based on a synoptic survey organized by the Florida Department of Natural Resources in January 1992, the population is known to number at least 1,856 animals. Of these, roughly half occur along the western coast of Florida and the other half along the eastern coast.

Although overall population trends in the southeastern United States and Puerto Rico are uncertain, it is likely both groups are either stable or declining. Collisions with boats and habitat destruction are the major threats in Florida and Georgia; habitat destruction and incidental catch in gillnets appear to be the primary threats in Puerto Rico.

Outside the United States, West Indian manatees are found in the Greater Antilles, along the Caribbean coast of Central and South America, in Trinidad and Tobago, and along the South American coast as far south as Recife, Brazil. In most of these areas, remaining populations are believed to be small. Poaching for food, incidental catch in gillnets, and habitat loss are among the most serious threats. Because most countries lack concerted manatee protection programs, the species' long-term survival may well depend on the success of efforts to protect remaining animals in Florida and Georgia.

The future of the southeastern U.S. population, however, is uncertain because of steadily increasing mortality since 1980 (Table 2). Most of this is due to increases in vessel-related deaths and perinatal (*i.e.*,

Table 1. Marine mammal species and populations listed as endangered (E) or threatened (T) under the U.S. Endangered Species Act as of 31 December 1992[1]

Common Name	Scientific Name	Status	Range
Manatees and Dugongs			
West Indian manatee	*Trichechus manatus*	E	Eastern North, Central, and South America coasts and rivers from southeast United States to Brazil, including Puerto Rico and other Greater Antilles Islands
Amazonian manatee	*Trichechus inunguis*	E	Amazon River basin of South America
West African manatee	*Trichechus senegalensis*	T	West Africa coasts and rivers; Senegal to Angola
Dugong	*Dugong dugon*	E	Northern rim of Indian Ocean from Madagascar to Indonesia; Philippines; Australia; southern China; Palau
Otters			
Marine otter	*Lutra felina*	E	Western South America; Peru to southern Chile
Southern sea otter	*Enhydra lutris nereis*	T	Central California coast
Seals and Sea Lions			
Hawaiian monk seal	*Monachus schauinslandi*	E	Hawaiian Archipelago
Caribbean monk seal	*Monachus tropicalis*	E	Caribbean Sea and Bahamas (probably extinct)
Mediterranean monk seal	*Monachus monachus*	E	Mediterranean Sea; Atlantic coast of northwest Africa
Guadalupe fur seal	*Arctocephalus townsendi*	T	West coast of Baja California, Mexico, to southern California
Steller sea lion	*Eumetopias jubatus*	T	North Pacific Rim from northern Japan to southern California
Whales, Porpoises, and River Dolphins			
Chinese river dolphin	*Lipotes vexillifer*	E	Changjiang (Yangtze) River, China
Indus river dolphin	*Platanista minor*	E	Indus River and tributaries, Pakistan
Vaquita	*Phocoena sinus*	E	Northern and central Gulf of California, Mexico
Northern right whale	*Eubalaena glacialis*	E	North Atlantic Ocean; North Pacific Ocean; Bering Sea
Southern right whale	*Eubalaena australis*	E	South Atlantic, South Pacific, Indian, and Southern Oceans
Bowhead whale	*Balaena mysticetus*	E	Arctic Ocean and adjacent seas
Humpback whale	*Megaptera novaeangliae*	E	Oceanic, all oceans
Gray whale[2]	*Eschrichtius robustus*	E	Eastern and western North Pacific; Bering Sea
Blue whale	*Balaenoptera musculus*	E	Oceanic, all oceans
Finback or fin whale	*Balaenoptera physalus*	E	Oceanic, all oceans
Sei whale	*Balaenoptera borealis*	E	Oceanic, all oceans
Sperm whale	*Physeter catodon*	E	Oceanic, all oceans

1 From Fish and Wildlife Service Regulations at 50 *C.F.R.* § 17.11

2 On 30 December 1992, the National Marine Fisheries Service declared that the "California" or "eastern" stock of gray whales had fully recovered and, effective 7 January 1993, would be removed from the list of endangered species. The western North Pacific stock of gray whales will remain listed as endangered.

Table 2. Known manatee mortality in the southeastern United States (excluding Puerto Rico) reported through the manatee salvage and necropsy program from 1978-1992[1]

Year	Vessel-Related Deaths No. (%)	Perinatal Deaths No. (%)	Flood Gate and Lock Deaths No. (%)	Other Deaths No. (%)	Deaths Inside Florida	Deaths Outside Florida	Total Deaths in S.E. U.S.
1978	21 (24)	10 (12)	9 (10)	46 (53)	86	0	86
1979	24 (28)	9 (12)	8 (10)	37 (47)	77	1	78
1980	16 (23)	13 (19)	8 (12)	30 (45)	63	4	67
1981	25 (21)	13 (11)	2 (2)	79 (66)	116	3	119
1982	20 (17)	14 (12)	3 (3)	83 (69)	114	6	120
1983	15 (19)	18 (22)	7 (9)	41 (51)	81	0	81
1984	34 (26)	26 (20)	3 (2)	68 (52)	128	3	131
1985	35 (27)	25 (20)	3 (2)	66 (51)	120	9	129
1986	33 (26)	27 (22)	3 (2)	62 (50)	122	3	125
1987	39 (33)	30 (25)	5 (4)	44 (37)	114	4	118
1988	43 (32)	30 (22)	7 (5)	54 (40)	133	1	134
1989	51 (29)	37 (21)	3 (2)	83 (48)	166	8	174
1990	49 (23)	45 (21)	3 (1)	117 (55)	206	8	214
1991	53 (30)	53 (30)	9 (5)	60 (34)	174	1	175
1992	38 (23)	49 (30)	5 (3)	73 (44)	162	4	166

1 Totals provided by the Florida Department of Natural Resources for 1992 are preliminary.

stillborn and newborn calf) deaths. These two causes accounted for 36 percent of all known deaths between 1978 to 1983. Between 1988 and 1992, the two categories combined increased to 52 percent of the total mortality.

Vessel-related manatee deaths have reached record levels in six of the past nine years. Between 1978 and 1983, 22 percent of the total known manatee mortality was attributed to this cause. Between 1988 and 1991 it was responsible for 28 percent of the total mortality. These percentages are probably underestimated because some carcasses are so badly decomposed by the time they are recovered that the cause of death is no longer detectable. As a result, some vessel-related deaths probably are classified as "undetermined." Increasing vessel-related manatee deaths parallel a dramatic increase in vessel traffic and vessel numbers. For example, in 1960 the number of boats registered in Florida was about 100,000; in 1991, the most recent year for which data have been tabulated, this number exceeded 700,000. In 1992 there was a marked decline in vessel-related deaths. While this may reflect increased efforts to regulate boat speeds in manatee habitat, data are not yet sufficient to evaluate cause-and-effect relationships between vessel-related manatee mortality and regulatory measures.

Perinatal deaths show a much sharper increase. Records have been equaled or exceeded in seven of the past nine years. From 1978 to 1983 about 14 percent of the total known mortality was listed as perinatal; between 1988 and 1992 it accounted for 25 percent. The cause of this increase is uncertain and may be due to different factors in different areas. Possible causes include pollution, disease, infection, poor nutrition, environmental changes, changes in the population age structure (*i.e.*, an increasing percentage of very young mothers), increasing noise, disturbance or stress from vessel traffic, collisions between vessels and nursing females, or a combination of these and other factors.

Degradation and loss of habitat due to coastal development are also major threats to the continued existence of manatees. In the late 1980s, Florida's human population grew at a net rate of more than 1,000 people a day, although this rate has declined slightly in the past two years. Much of the associated development has been concentrated along coastal waters and rivers important to manatees. The resulting siltation, nutrient enrichment, and other forms of water pollution, as well as removal or filling of wetlands by construction projects, either degrade or destroy manatee habitat. Factors decreasing water clarity may be particularly important because they reduce the vigor and extent of seagrasses used by manatees for food. Development along waterways also eliminates natural, secluded areas for mating, calving, and nursing. Such effects generally reduce the capacity of coastal and river ecosystems to support manatees and other aquatic life native to Florida. In the long term, loss of habitat and environmental pollution may well pose the most serious threats to manatees.

Past Recovery Activities

The Fish and Wildlife Service is the Federal agency with lead responsibility for recovery of West Indian manatees under both the Endangered Species Act and the Marine Mammal Protection Act. At the state level, the Florida Department of Natural Resources has assumed an increasingly prominent role in carrying out many fundamental research and management functions. However, because of the nature and extent of needed recovery efforts, many other Federal and State agencies, industry groups, and public and private organizations also are involved and contribute greatly.

Concerted efforts to organize a cooperative program regarding manatees began with the development of a recovery plan, adopted by the Fish and Wildlife Service in 1980. The Marine Mammal Commission worked closely with the Service to help draft and implement the plan (see previous annual reports). Although ensuing cooperative efforts were generally well placed, they were insufficient, given the magnitude of increases in vessel traffic and shoreline construction in Florida. As a result, vessel-related manatee deaths increased significantly (see Table 2), and essential manatee habitat, such as grassbed feeding areas, continued to be degraded or destroyed.

Therefore in 1987 the Commission recommended that the Service reexamine the entire recovery program to better address the fundamental problems and to update the Recovery Plan accordingly. The Service shared the Commission's concerns and began working closely with all involved parties to do so. To help accomplish this, the Commission prepared two reports, the first reviewing manatee recovery program needs (see Appendix B, Reynolds and Gluckman 1988) and the second identifying specific actions needed to protect manatee habitat on the Atlantic coast of Florida and Georgia (see Appendix B, Marine Mammal Commission 1989).

With broad support for the effort, work on updating the plan was soon completed. The revised Recovery Plan was adopted by the Service in May 1989 and signed by the heads of 12 cooperating Federal and State agencies and private organizations, including the Marine Mammal Commission. The revision provided a clear framework for action and called for a significant increase in efforts and commitments by almost all involved parties.

Specifically, the revised plan called for expanding satellite tagging and tracking of manatees to gather more precise information on manatee habitat-use patterns; improving the manatee salvage and necropsy program to better detect and monitor mortality trends; speeding development of a geographic information system to store, manipulate, and retrieve data for research and management purposes; enlarging the system of boat speed regulatory zones; strengthening enforcement of established zones; adding key manatee habitat to existing Federal and State refuge and reserve systems; and controlling development in key manatee areas.

While the revised plan called for increased efforts by most cooperating agencies and organizations, the greatest demands fell on the Fish and Wildlife Service and the Florida Department of Natural Resources. Both agencies have worked diligently to meet their expanded commitments.

For example, shortly after the Recovery Plan was updated, the Commission reviewed the revised plan to assess funding and personnel levels needed by the Service to meet its basic research and management obligations in Fiscal Years 1991 through 1995. The results, provided to the Service by letter of 2 March 1990, recommended that, in Fiscal Years 1991 and 1992, funding for research be increased to at least $583,000 and $598,000, respectively, and that funding for management be increased to at least $315,000 and $327,000, respectively. To help meet its expanded obligations, the Service was granted a special Congressional appropriation for work on manatees and certain other endangered species late in 1990. Subsequently, by letters of 12 March and 20 May 1991, the Service advised the Commission that it intended to support manatee work at levels in excess of those identified in the Commission's letter.

With strong leadership and support from the Florida Legislature, the State's Department of Natural Resources also has made outstanding progress. In 1989, the State Legislature authorized a Save the Manatee Trust Fund to cover the salaries and expenses related to manatee work in Florida. The fund is maintained in part by fees collected for a special Florida automobile license plate featuring a manatee. Support is also provided by allocating a small portion of annual State boat registration fees, supplemental donations offered by Florida boaters when submitting boat registration forms, and other sources. The fund enabled the State Legislature to increase the Department's manatee budget to $1.2 million in State Fiscal Year 1990-91 (1 July to 30 June) and $2.2 million in Fiscal Year 1991-92. For Fiscal Year 1992-93, the State Legislature has authorized $2.9 million for the manatee program.

Part of the funding increase has been used to expand the program staff from fewer than 10 to more than 20 employees. Major departmental activities include (1) developing and implementing county-wide boat speed regulatory zones in 13 key counties where the risk of manatee-vessel collisions is greatest; (2) helping those key counties develop manatee protection plans; (3) purchasing equipment and facilities to improve the manatee salvage and necropsy program and coordinate manatee rescues; (4) expanding aerial survey and radio-tracking studies to monitor manatee movements and numbers; (5) developing a geographic information system to handle data needed for day-to-day manatee management decisions; and (6) reviewing permit applications for proposed developments and events (*e.g.*, boat races) in manatee habitat.

Although the Fish and Wildlife Service and the Florida Department of Natural Resources together form the core of the manatee recovery program, the involvement of many other agencies and organizations is no less important. In this regard there is an outstanding record of contributions and support. For example, the Florida Governor and Cabinet and county officials are devoting substantial efforts to developing boat speed regulations and other measures that will be included in county manatee protection plans. Similarly, the Governor and Cabinet and the State's Land Acquisition Advisory Council have directed the acquisition of thousands of acres of prime manatee habitat for inclusion in State park, reserve, and preserve systems.

Examples of strong Federal agency support include the Navy's prompt response to manatee mortalities caused by the propellers of large tugs at the Kings Bay submarine base in southeast Georgia. At considerable expense, the Navy designed, built, and installed propeller shrouds on all the base's large tugs to counter the threat that the powerful blades posed to manatees. The base also instituted a public education program on manatees in cooperation with the local community and installed propeller shrouds on all other base vessels. To avoid similar problems with large vessels at the Kennedy Space Center, the National Aeronautics and Space Administration took action in the early 1980s to incorporate auxiliary water-jet propulsion systems on the ships used to retrieve booster rockets after launches of the space shuttle.

The manatee recovery program also benefits from strong private sector involvement. For example, since the late 1970s, Florida Power & Light Company has conducted an excellent public education and awareness program. It has also funded aerial surveys and other important manatee research and cooperated in managing conditions at thermal discharges used by mana-

tees. Similarly, since its creation in the mid-1980s, the Save the Manatee Club has become a major contributor to public awareness efforts and support for manatee research, and has provided a strong voice of public support for manatee conservation actions.

As discussed in previous annual reports, notable contributions have been made by the Army Corps of Engineers, the U.S. Coast Guard, the National Marine Fisheries Service, the Florida Marine Patrol, the Florida Game and Fresh Water Fish Commission, the Florida Department of Community Affairs, Florida's Inland Navigation Districts and Water Management Districts, the Georgia Department of Natural Resources, several commercial marine zoological parks and oceanaria in Florida, The Nature Conservancy, various colleges and universities, and other agencies and organizations.

Marine Mammal Commission Review of the Manatee Recovery Program

As noted above, the Fish and Wildlife Service adopted a revised Florida Manatee Recovery Plan in 1989. The revised plan included budget and task projections for both research and management work over a five-year period. In late 1991 — about halfway through the five-year planning period — the Commission concluded that a thorough review of the manatee recovery program should be held to evaluate progress, to determine if task and funding projections developed three years earlier remained valid or needed to be adjusted, and to begin identifying changes that should be considered when the plan is next updated.

To conduct the review, the Commission and its Committee of Scientific Advisors on Marine Mammals scheduled their 1992 annual meeting for 30 April-2 May in Tallahassee, Florida. Two days of the meeting were dedicated to reviewing all aspects of the manatee recovery program. Representatives of the Fish and Wildlife Service, several agencies of the State of Florida, county governments, and public and private groups involved in recovery work participated.

In general the Commission concluded that, while it remains uncertain whether the envisioned research and management measures will, in fact, reduce human-caused manatee mortality and habitat degradation rates, that which is contemplated appears reasonable and offers the best chance of success if fully carried out. Moreover, impressive progress is being made to expand efforts in almost all areas, and most work appears to be progressing quickly. Some specific results of the review are discussed below.

The Manatee Salvage and Necropsy Program — Representatives of the Florida Department of Natural Resources noted that manatee mortality data collected through the salvage and necropsy program continue to be one of the most important bases for making manatee management decisions. To improve the program, the Department recently increased the number of program staff, designed and contracted for delivery of the first of five refrigerated trailers for transporting carcasses and, with funds provided by the Fish and Wildlife Service under section 6 of the Endangered Species Act, began constructing a dedicated manatee necropsy laboratory at Eckerd College, St. Petersburg, Florida. Important program needs are to identify the factors contributing to the increase in perinatal deaths, to evaluate potential disease processes, and to improve the manatee tissue bank.

Manatee Tagging and Tracking — Scientists with the Fish and Wildlife Service reported that a program capable of radio-tagging and tracking by satellite some 20 manatees per year is now in place. Although work presently is focused on the east coast of Florida, the Service has started a pilot tracking study in cooperation with the Navy in Puerto Rico, and the Florida Department of Natural Resources has begun a pilot study to tag and track animals in Tampa Bay on the west coast of Florida. The resulting data on manatee movements are opening a new window of understanding with which to develop and evaluate site-specific management options and to consider manatee life history and habitat use. Future needs include maintaining the present level of effort, ensuring rapid entry of data into the geographic information system database, and identifying other regions of the State where future radio-tracking work should be focused.

Manatee Population Dynamics — On 4-6 February 1992 the Fish and Wildlife Service and the Florida Department of Natural Resources convened a work-

shop, in which the Commission participated, to evaluate information on the population biology of Florida manatees. As part of the workshop, a panel of population biology experts reviewed available data to identify analyses that could be done to better determine population trends. Representatives of the Service and the Department reported on the results of the workshop at the Commission's meeting. They noted that significant progress had been made on defining key population parameters, such as population size, survival rates, the percentage of reproductively mature animals, and the age at first reproduction. In particular, they noted that new estimates for certain parameters recently had been developed and that new research capabilities for estimating the age of dead manatees (*i.e.*, by examining their ear bones and utilizing the manatee photo-identification scar catalogue) would soon yield new or better estimates for several key parameters.

Future research needs identified at the workshop as being particularly important include continuing to develop age-determination techniques; evaluating the use of aerial photogrammetry to assess population age-structure based on animal lengths; maintaining photo-identification records in the manatee scar catalogue and using those records to estimate survival rates by means of mark/recapture analyses; assessing the accuracy of parameter estimates based on different data sets; and developing provisional population models using those estimates.

Development of a Geographic Information System — Much progress also has been made by the Florida Department of Natural Resources in developing a computerized geographic information system containing manatee data. During the past three years, base maps covering manatee habitat in the United States have been digitized. In addition, key manatee data sets (*e.g.*, manatee mortality data, radio-tracking locations, and aerial survey sightings) have been entered. The system is now a basic tool for providing Federal, State, and local officials with site-specific information for routine research and management tasks. It is especially valuable for reviewing permit applications and developing boat speed regulations. Major needs are to ensure that key agencies have the hardware, software, and staff expertise to fully utilize the system, and to constitute a geographic information system coordinating team to guide future system development and use.

Boat Speed Regulations — Perhaps the most demanding and controversial element of the manatee recovery program is an important initiative by the State of Florida to institute boat speed rules for waterways in each of 13 key manatee counties. Prior to the initiative, boat speeds were unrestricted in almost all areas. Because boaters cannot easily sight and avoid manatees, rules are necessary to reduce boat speeds in areas where manatees occur most often so that manatees have some chance of avoiding oncoming boats. Begun in 1989, the rulemaking effort is being done on a county-by-county basis.

The process begins with deliberations between county and Florida Department of Natural Resources staff to develop proposed county-wide rules. Proposals are designed to reflect local patterns of manatee use and boat traffic. Local hearings are then held to solicit public comment, proposed rules are modified as warranted, and final proposed rules are submitted to the Florida Governor and Cabinet for review and approval. County rules usually include the following basic types of zones, which may be seasonal or year-round: limited access (*e.g.*, no entry); idle speed; slow speed (*i.e.*, about 5 to 8 MPH); and restricted speed (*e.g.*, 20, 25, or 30 MPH). A county rule package may cover hundreds of miles of waterways. Once adopted, zones must be posted with signs, the regulations must be made known to boaters, and the rules must be enforced.

During the Commission's review, representatives of the Florida Department of Natural Resources reported that rules had been adopted for 8 of the 13 key manatee counties over the past two and one-half years and that rules for each of the remaining five counties were in various stages of development. Although the process has taken longer than anticipated, progress to date has been outstanding, given the required steps in the rulemaking process and the often intense public debate over proposed measures. Although only time will tell, it appears that the adopted measures offer a realistic hope for effectively lessening the number of manatee collisions with

recreational boats in the affected counties. As noted above, there was a marked decline in vessel-related deaths in 1992 (see Table 2) although it is too soon to determine if this is the result of recently implemented management measures.

Florida's Inland Navigation Districts are responsible for posting and maintaining signs for adopted regulatory areas within their boundaries. This includes all coastal counties on the State's east coast and four coastal counties on the west coast. Outside of these areas, responsibility for posting signs is shared by the Florida Department of Natural Resources and the individual counties. Given the extent of new regulatory zones, the task of identifying sign locations and posting and maintaining signs is enormous. Significant progress has been made, but much remains to be done.

At the Commission's review, a representative of the Florida Inland Navigation District, the agency responsible for posting and maintaining signs on Florida's east coast, reported that about 700 signs had been posted since adoption of the first county rules in 1990. An additional 800 to 1,000 signs may be needed by the time rules for the remaining east coast counties are adopted.

Enforcement of the regulations is provided principally by the Florida Marine Patrol and the Game and Fresh Water Fish Commission. The heads of both of those agencies reported on the commitment of their officers to enforcing the new manatee rules. Because of staff limitations and many other enforcement responsibilities, however, enforcement of the new rules is difficult. To address the burden, it was suggested that funds be provided to pay overtime for enforcement officers who choose to extend their patrols and devote the additional time exclusively to enforcing manatee protection rules. It also was noted that compliance could be enhanced by new boater education programs and charts designed to make operators aware of waterway rules before venturing onto waterways.

In addition to collisions between manatees and fast-moving boats, large, slow-moving vessels also cause an unknown number of manatee deaths. These deaths may be due, in part, to animals being pulled into propellers by the currents generated by large, powerful blades or because the deeper draft of large vessels does not provide adequate clearance between the bottom, where manatees dive to avoid the vessel, and the vessel's propeller. Recent work by the Navy to design and install propeller guards on large tugs at its base in Georgia suggests that useful mitigation measures are possible. Therefore, an assessment of manatee mortality caused by large vessels and possible responses to the problem appears warranted.

County Manatee Protection Plans — Given the rapid growth of Florida's human population and the need to plan properly for associated development, the Florida Legislature passed a law in 1984 requiring local governments to prepare growth management plans. As part of these plans, the 13 key manatee counties are to prepare manatee protection plans. Although boat speed rules are intended to be the centerpiece of these plans, other manatee protection provisions, such as boating studies, marina siting policies, and information and education programs, must also be addressed. As work to develop boat speed rules is completed, other planning elements will receive greater attention. Growth management plans must be approved by the Department of Community Affairs, and the Florida Department of Natural Resources works closely with the Department and the counties on the manatee protection component.

To date, Citrus County is the only county to have an approved manatee protection plan. Work on plans by the other 12 counties is in various stages of completion. Substantial efforts are needed to complete manatee protection plans for the remaining 12 key counties and to extend similar efforts to other counties that have relatively high manatee numbers or high manatee mortality.

Land Acquisition — Over the past 30 years the State of Florida has developed the nation's most aggressive State land acquisition program. A central part of its efforts has been to purchase lands through the Conservation and Recreational Lands (CARL) Trust Fund. At the direction of the Florida Governor and Cabinet, special attention has been given to acquiring important manatee habitat. Five percent of

the annual CARL program budget presently is devoted to acquisitions benefiting manatees.

At the Commission's review, a representative of the Florida Department of Natural Resources, Division of State Lands, reported that, since 1963, the State has spent approximately $500 million to acquire 250,000 acres of land important to manatees. Particularly important purchases have been made along and near the Crystal River on the west coast, around Rookery Bay in southwest Florida, near Blue Springs on the upper St. Johns River, and at several locations along the east coast.

To carry land acquisition efforts into the 21st century, the State has embarked on a 10-year bond program called Preservation 2000. The program envisions $300 million per year for land acquisitions, half of which would be allocated to the CARL program. Among the projects most important to manatees now on the State's land acquisition priority list are a project along the Crystal River on the west coast, two projects on the upper St. Johns River between Lake George and Lake Monroe, and a project along the banks of the Sebastian River on Florida's east coast.

The Fish and Wildlife Service also has successfully met manatee conservation objectives through acquisition of habitat for National Wildlife Refuges. Since 1980, the Service has purchased lands along the lower Suwannee River, in Kings Bay at the head of the Crystal River, and, most recently, along the lower Homosassa River. During the review, representatives of the Service reported on a new refuge-related initiative to explore further acquisitions along the Crystal River.

Permit Reviews — Section 7 of the Endangered Species Act requires Federal agencies to consult with the Fish and Wildlife Service to identify and avoid possible effects of their activities on endangered species, such as manatees, for which the Service is responsible. To meet this responsibility, the Service consults with the Corps of Engineers to evaluate individual and cumulative effects on manatees and manatee habitats of proposed marinas, docks, bulkheads, and other dredge and fill projects. Such work typically requires a permit from the Corps under section 404 of the Clean Water Act. A parallel permit system is administered by the Florida Department of Environmental Regulation in consultation with the Department of Natural Resources.

Hundreds of permit applications for work in manatee habitat are submitted and reviewed annually. For projects that may affect or are likely to affect manatees or their habitat adversely, the Service is obligated to provide to the Corps a biological opinion on possible effects and mitigation measures. To help identify which applications are of concern to manatees, the Service has developed and provided to the Corps a reviewer checklist. Over the past three years, the Service has written formal biological opinions on nearly 100 applications per year. The opinions have recommended actions ranging from permit denial or project modification, in cases judged likely to affect manatees or their critical habitat, to permit approval with certain manatee conservation measures included in cases where project effects are deemed controllable.

During the Commission's review, representatives of the Service and the Corps described the extent to which advice provided in the Service's biological opinions has been adopted. The Corps has adopted most but not all of the Service's recommendations. In particular, the Corps has declined to include some identified conservation measures as permit conditions (*e.g.*, restricting the use of some boat slips in marinas to sailboats) because of enforcement difficulties. In addition, many measures that have been included as permit conditions by the Corps appear to have been disregarded by permit holders.

To resolve these problems, the Corps is taking steps to contract for permit compliance inspections, and the State is increasing its compliance inspection efforts. In addition, the Service, the Corps, and the Florida Department of Natural Resources are developing checklists to ensure that permits issued are consistent with county manatee protection plans. Steps also are being taken to ensure that Federal and State permits are consistent with the interim State boating facility policy that now limits construction of new powerboat slips in the 13 key manatee counties to one slip per 100 feet of shoreline.

Flood Gates and Navigation Locks — Along Florida's waterways, manatees sometimes are caught in the doors of flood gates or navigation locks and are crushed or drowned. Between 1977 and 1980, an average of eight such deaths was recorded annually. To address the problem, the programs for computer-operated gates were modified to eliminate narrow openings that might trap animals. For seven of the next ten years, deaths attributable to these structures declined to three or fewer per year, and it was thought that the problem was resolved. Higher mortality levels (seven deaths) in 1983 and 1988 were considered anomalous and due, at least in part, to system failures. In 1991, however, the previous mortality record due to gates and locks (nine deaths in 1978) was equaled and some deaths occurred at modified structures that apparently were working properly. The responsible agencies therefore constituted a task force to investigate the problem.

During the Commission's review, representatives of the South Florida Water Management District, the Department of Natural Resources, and the Fish and Wildlife Service reported on task force work to date. While the cause of the recent mortality increase is not fully understood, some deaths may be due to an increase in the frequency of gate openings caused inadvertently by previous modifications to maintain a minimum opening safe for manatees to pass through. Further adjustment of gate opening cycles are therefore being tested. However, because this does not appear to be the only factor involved, other solutions are being reexamined. Sonar detection devices to alert operators when animals are near gates are being tested. Other solutions under discussion include the installation of slotted gates and automatic reverse mechanisms similar to safeguards on elevator doors.

Program Review Follow-Up

After its manatee program review, the Marine Mammal Commission consulted with its Committee of Scientific Advisors and took the following actions:

Recovery Program Priorities and Support — When the Service adopted the revised Manatee Recovery Plan in 1989, the Commission reviewed its provisions and wrote to the Service on 2 March 1990, recommending minimally acceptable levels of funding and personnel needs through Fiscal Year 1995. Because it is difficult to predict rates of progress and new developments several years in advance, such assessments need to be reexamined periodically. A major objective of the Commission's 1992 program review, therefore, was to reexamine its earlier recommendations. In light of what was learned, the Commission wrote to the Service on 17 June 1992.

In its letter the Commission noted that substantial cooperative efforts had been initiated in the past three years and appeared to be addressing the critical issues. It also noted that this progress was, in no small measure, directly attributable to the revised Recovery Plan and the work of the Fish and Wildlife Service staff. With regard to future research and management work by the Service, the Commission's 17 June letter updated its March 1990 recommendations on priority task and resource needs.

For Service research, the Commission noted that priority needs include maintaining recently established telemetry capabilities, developing methodology and programs to monitor the condition of essential manatee feeding habitats, and pursuing certain new manatee life history work (including manatee age determination research, aerial photogrammetry to define manatee population size/age class structure, studies of the nutritional value of food plants, and survival rate estimation). The Service's manatee research is carried out by the National Ecology Research Center's Sirenia Project, based in Gainesville, Florida. To meet its manatee research needs, the Commission recommended that the Sirenia Project be supported at the following levels over the next five fiscal years: $704,000 in 1993; $693,000 in 1994; $689,000 in 1995; $701,000 in 1996; and $669,000 in 1997.

Among its priority management needs, the Commission noted that the Service needed to continue consultations with the Corps of Engineers and other agencies on activities affecting manatees; assist State and county officials in developing local manatee protection plans and rules; develop and implement rules for new manatee sanctuaries and refuges; assess the incidence of and possible solutions to manatee mortality caused by large vessels; pursue steps to

facilitate judicial review of manatee protection rule violations; oversee manatee rescue and rehabilitation activities, including preparation of a plan for large-scale rescues in the event of a catastrophic incident; and generally oversee cooperative recovery work, including updating the Recovery Plan and convening meetings of the Manatee Recovery Team.

Most of the Service's management responsibilities are carried out by the regional office's Endangered Species Field Office in Jacksonville, Florida. To help carry out many of the above-mentioned tasks, the Commission recommended that the Service hire a technician trained in the use of computer-based geographic information systems and that it support the Field Office manatee program at the following levels over the next five fiscal years: $400,000 in 1993; $314,000 in 1994; $263,000 in 1995; $279,000 in 1996; and $295,000 in 1997.

In addition to the above matters, several National Wildlife Refuges administered by the Service contribute directly to manatee protection and offer valuable opportunities to educate the public about manatee conservation issues and needs. One of the most important refuges for manatees is the Crystal River National Wildlife Refuge in Florida's Kings Bay. The bay, fed by natural warm-water springs, is an essential winter refuge for more than 200 manatees. The presence of manatees and the chance to dive in the bay's clear, warm waters attract tens of thousands of visitors annually.

To assure that refuge visitors are aware of manatee protection rules in the bay and to enhance public awareness of manatee issues generally, the Service recognizes the need for a strong public education program. However, it has not yet been able to establish such a program. Therefore the Commission's letter of 17 June 1992 also recommended that the Service add a public use specialist to the refuge staff and provide $50,000 to design refuge exhibits, brochures, and programs to explain facts, issues, and needs concerning manatee protection.

The Service responded positively to these recommendations by letter of 15 July 1992. It noted that continuing high levels of human-caused mortality demonstrate that recovery work still lags behind recovery needs. It also noted that it agreed with the Commission's recommended task and funding priorities and that it intended to strive to meet those needs.

Refuge Expansion — By separate letter of 17 June 1992 to the Service, the Commission also recommended measures to expand National Wildlife Refuges in Florida to better protect manatee habitat. As noted above, Crystal River is one of Florida's most essential manatee habitats. Important land acquisitions were made by the Service and the State along the Crystal River and its headwaters in Kings Bay in the early- and mid-1980s. Since then, the State has retained an active project to acquire much of the river's shoreline. However, progress has stalled, prompting the project's priority ranking to decline. To help move acquisition forward, the Commission recommended that the Service reexamine refuge acquisition along the Crystal River to assist the State's efforts.

The Commission also recommended steps to protect a recently identified manatee habitat in the Sebastian River on Florida's east coast. This river lies north of Pelican Island National Wildlife Refuge, and the Service recently began discussions with the State to allow staff of the Pelican Island refuge to manage the river's State-owned submerged lands. Discussions during the Commission's review suggested that the proposal had merit. Therefore, in its letter, the Commission urged the Service to actively pursue its negotiations with the State.

Recovery Plan Update — The Florida Manatee Recovery Plan adopted by the Service in 1989 covers a five-year planning period ending in Fiscal Year 1993. Recognizing that no one agency or organization has either the authority or resources to do all that could or should be done, the plan has successfully fostered and guided cooperative Federal, State, academic, industry, and public involvement in recovery work. To remain useful, it must be updated. Thus, another major objective of the Commission's review was to assess needs for updating the plan.

During the review, Service representatives noted the impending need to revise the plan but that work had not yet been started. Therefore, to help begin the

process, the Commission developed a draft outline of tasks to use in updating the current plan and sent it to the Service on 16 October 1992. Based on discussions during the review, the outline omitted tasks that had been completed or were no longer warranted, elaborated on tasks that should be continued, and added new tasks that appear possible and appropriate, given recent progress. As with the present plan, the suggested outline included tasks to minimize causes of manatee injury and mortality, protect essential manatee habitat, determine and monitor the status of manatee populations, and coordinate recovery work.

The current plan was developed by the Service in cooperation with the West Indian Manatee Recovery Team, which includes representatives of the major groups participating in the recovery program, including the Marine Mammal Commission. Because the Service was planning a team meeting in November 1992, the Commission recommended that the agenda for the meeting include a discussion on updating the plan, and that the Service circulate the draft outline to team members in advance of the meeting to facilitate discussion of the next plan's content, organization, and preparation schedule.

The Service agreed, and during the team's 5 November 1992 meeting the draft outline was reviewed. The team found the outline to be a useful basis to begin revising the plan. To help update the plan, the team also agreed to develop a suggested text for Service consideration and established a drafting committee. The team expects to complete an initial draft plan by next summer and to provide it to the Service at that time. It is hoped that a public review draft will be available by the fall of 1993.

Other Florida Manatee Recovery Activities in 1992

During 1992 significant progress continued on many crucial recovery tasks. Some of the important accomplishments are noted below.

Boating Regulations — As discussed above, in 1989 the Florida Governor and Cabinet directed county officials and the Florida Department of Natural Resources to develop interim boat speed and access rules to protect manatees in 13 key counties. The interim rules are to be modified as needed and made final upon subsequent completion of county manatee protection plans. By the end of 1991 interim rules for eight counties had been developed and approved by the Florida Governor and Cabinet. During 1992 interim rules were developed and adopted for two additional counties, and all counties had begun work on their county manatee protection plans.

Manatee Rescue and Rehabilitation — Presently, some 40 manatees are being maintained in captivity at five facilities in Florida. Some animals have been in captivity since before the Marine Mammal Protection Act was passed in 1972, others have been captured to treat injuries or other problems, and some animals were born in captivity. In the 1980s rescue and rehabilitation work began as a research effort authorized under a scientific research permit issued to the Service. As capture methods and treatment techniques were refined, such work gradually became a routine management activity. In 1992, therefore, the Service transferred responsibility for rescue and rehabilitation work from its research staff to its management staff, and submitted an application for an enhancement permit under the Marine Mammal Protection Act to authorize future rescue work (see also Chapter XI). The permit, which would be the first enhancement permit issued under the Act, is expected to be issued early in 1993.

The Service also took several other steps in 1992 to improve cooperative rescue and rehabilitation efforts. For example, it convened two meetings of an interagency/oceanaria working group established in 1991 to coordinate captive manatee management and rehabilitation. With the aid of the working group, the Service formalized arrangements for handling distressed animals, developed criteria and schedules for returning captive animals to the wild, established guidelines to avoid captive breeding that could cause overcrowding in rehabilitation facilities, and initiated work on a response plan for large-scale rescues in case of catastrophic events. It also established a planning committee of the working group to help evaluate research proposals involving captive animals and to ensure that authorized studies do not interfere with rehabilitation and release goals.

Other Manatee Populations

As noted above, West Indian manatees occur in the Greater Antilles, along the Caribbean coast of Central and South America, and on the Atlantic coast of South America into Brazil. Although there is broad recognition of the need to improve manatee protection in these areas, support for manatee research and management activities is generally lacking. When opportunities arise and resources permit, the Commission, as well as other agencies and groups in the United States, help support or encourage efforts to address basic needs in other countries.

Southern Yucatan Peninsula — One of the largest known manatee populations outside of Florida occurs along the southern Yucatan Peninsula in Belize and the Mexican state of Quintana Roo. In 1989 the Save the Manatee Club and the Lowry Park Zoological Society of Tampa, Inc. supported an aerial survey of Belize led by a representative of the U.S. Fish and Wildlife Service. The survey produced a high count of 102 manatees. The number of animals seen in selected areas exceeded the highest aerial survey counts of any comparably sized area in the Caribbean.

Researchers in Belize and Mexico are interested in cooperative efforts to protect this manatee population. To help identify and coordinate priority research and management work along this coast, the Centro de Investigaciones de Quintana Roo convened a workshop on 7-8 September 1992 in Chetumal, Mexico. Participants included scientists and resource managers from both countries. Representatives of the Fish and Wildlife Service and the Marine Mammal Commission were invited and provided technical advice.

During the meeting participants identified priority conservation work. Research priorities included developing a cooperative aerial survey program, starting a radio-tagging and tracking study, improving efforts to recover and examine manatee carcasses, and assessing and monitoring key habitat features. Management priorities included developing public education materials, particularly those aimed at encouraging compliance with bans on hunting manatees, and ensuring that new development is consistent with manatee conservation objectives.

Following the meeting participants cooperated in preparing a proposal for the joint Belize-Mexican work on aerial surveys, local education, and training. The proposal was submitted to the U.S. Fish and Wildlife Service's Office of International Affairs, which provides funding for projects afforded priority by the U.S.-Mexico Joint Committee on the Conservation of Wildlife and Fauna and Flora. At the Committee's XVIth meeting in December 1992, the project was reviewed and included among projects recommended for funding. Early in 1993, the Service's Office of International Affairs will consider available funding and make its final decisions on support for projects endorsed by the Committee.

Nicaragua — An area for which manatee data are particularly scarce is the coast of Nicaragua. To help assess the status of manatees in this area, the Commission provided partial support in 1992 for a study involving aerial surveys and interviews with coastal residents (see Chapter X). Preliminary results indicate that a significant number of manatees occur along Nicaragua's coast, but that hunting continues to pose a serious threat. As an unrelated finding, the survey team documented a significant range extension of the tucuxi (*Sotalia fluviatilis*), a dolphin species not previously known in waters north of Panama. A study report is expected to be published in 1993.

The Cartagena Convention — Work to encourage manatee recovery in countries or regions throughout the wider Caribbean region also is being pursued under auspices of a Protocol on Specially Protected Areas and Wildlife. When it enters into force, the Protocol will become part of the Cartagena Convention (the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region), which provides a framework for international cooperation in support of the Caribbean Environment Program. The program, one of 11 Regional Seas Programs, is sponsored by the United Nations Environment Program and the region's participating nations. Its purpose is to establish cooperative international work on regional environmental protection and development issues.

The Protocol on Specially Protected Areas and Wildlife was signed in 1991 and will enter into force

when 9 of its 13 signatory nations ratify or accede to its provisions. The United States, one of the signatory nations, is now in the process of ratifying the Protocol. The Protocol calls for cooperation in managing and protecting regional wildlife and wildlife habitat of particular concern. In anticipation of the Protocol's entry into force, the Regional Coordinating Unit of the United Nations Environment Program convened a meeting of the Interim Scientific and Technical Advisory Committee for the Protocol in Kingston, Jamaica, on 4-8 May 1992.

During the meeting it was noted that the West Indian manatee is the most endangered marine mammal in the region. It was also noted that, pending development of national recovery plans, support for manatee recovery work, particularly preparing and distributing public awareness materials, was a matter of great urgency.

The Parties to the Caribbean Environment Program met on 16-18 November 1992 in Kingston, Jamaica, to consider work during the 1992-1993 and the 1994-1995 planning cycles. No decisions on manatee work were reached; however, it is expected that a regional manatee workshop will be convened in 1993 or 1994.

Sea Otter
(*Enhydra lutris*)

The sea otter is the only strictly marine member of the Family Mustelidae and the only species in the genus *Enhydra*. With the exception of the South American marine otter (*Lutra felina*), the sea otter is the smallest marine mammal in the world.

Prior to commercial exploitation, sea otters were distributed in nearshore waters around the Pacific rim from Hokkaido in northernmost Japan through the Kuril Islands, Kamchatka Peninsula, the Commander Islands, the Aleutians, peninsular and south coastal Alaska, and southward down the west coast of North America to Baja California. It is estimated that in the mid-1700s, prior to the onset of commercial hunting, the worldwide population of sea otters was 150,000 to 300,000.

Following the discovery of Alaska in 1741, sea otters were the target of extensive commercial hunting that continued for 150 years. Hunting was unregulated and, by the early 1900s, only 13 small and widely scattered remnant groups survived. Total abundance at that time may have been as few as 1,000 to 2,000 animals.

Commercial exploitation ended in 1911 when the North Pacific Fur Seal Convention was signed by the United States, Russia, Great Britain, and Japan. During the next 80 years, sea otters recolonized or were reintroduced to a substantial part of their historic range in the Soviet Union, the Aleutian Islands, south coastal Alaska, and California.

Efforts undertaken by the Marine Mammal Commission and others to ensure protection of sea otters and their habitat have been discussed in previous annual reports. A summary of these actions and a discussion of efforts undertaken in 1992 follow.

The Central California Population

The remnant sea otter population in California occupied only a few miles of nearshore habitat along the rocky Point Sur coast and may have numbered fewer than 50 animals in 1911 when hunting was prohibited by the Fur Seal Convention. Protected by the Convention and later by the State of California, the population grew slowly until, by the mid-1970s, nearly 1,800 animals inhabited nearshore areas along approximately 160 miles of the central California coast. At that time, the risk of oil spills along the central California coast was expected to increase largely because of the increased tanker traffic transporting oil from the Trans-Alaska pipeline, then nearing completion.

Because of its small size, its limited distribution, and the increasing risk of oil spills and other catastrophic events, the population was designated as threatened under the provisions of the Endangered Species Act in January 1977. Recognizing that range expansion was the best way to minimize the risk of oil spills and that range expansion could impact commercial and recreational abalone and other shellfish fisheries that had developed in the absence of sea

otters, the Commission in December 1980 recommended that the Fish and Wildlife Service adopt and implement a management strategy recognizing the ultimate need for "zonal" management of sea otters and the need to establish one or more sea otter colonies at a site or sites not likely to be affected by an oil spill in or near the population's present range. The Fish and Wildlife Service concurred with the Commission's recommendation and incorporated the zonal management concept into the Southern Sea Otter Recovery Plan adopted in February 1982.

The Fish and Wildlife Service initiated efforts in 1981 to identify possible sites for establishing one or more "reserve" sea otter colonies off California, Oregon, and Washington, develop a translocation plan, and assess the possible environmental and economic consequences of re-establishing sea otters in additional parts of their historic West Coast range. In the fall of 1986, Congress passed Public Law 99-625, which included provisions authorizing and encouraging the development and implementation of a plan to establish at least one sea otter colony outside the then existing sea otter range in California. The law required that the plan specify a translocation zone that would meet the habitat needs of the translocated animals and provide a buffer against possible adverse activities that may occur outside the zone. It also required that the area surrounding the translocation zone be designated a "management zone" from which sea otters are to be excluded by non-lethal means, to prohibit range expansion and protect fishery resources south of Point Conception. The law further specified that the management zone not infringe on the population's existing range or on adjacent range where expansion is necessary for recovery of the species.

The Fish and Wildlife Service subsequently developed and adopted a plan to establish a reserve sea otter colony at San Nicolas Island. This island is one of the California Channel Islands, and activities there are managed by the Navy. Implementation of the plan required cooperative efforts by the Navy as well as by the Fish and Wildlife Service and the California Department of Fish and Game. To clarify their respective roles, the two agencies concluded a Memorandum of Understanding on 18 August 1987. Among other things, the Memorandum specified that:

- the Fish and Wildlife Service will be responsible for providing funds and personnel necessary to implement, enforce, and carry out the translocation program;

- if verified sightings of sea otters are made at any location within the designated management zone ("no-otter zone"), the Fish and Wildlife Service will undertake recapture efforts in cooperation with the California Department of Fish and Game, as soon as weather and sea conditions permit, and return the captured otters either to the mainland sea otter range or to the translocation zone;

- the Fish and Wildlife Service, in cooperation with the California Department of Fish and Game, will (a) evaluate the safety, effectiveness, and cost of possible alternative techniques for limiting population growth, including but not limited to reduction of fecundity, and (b) assess as part of a long-term management plan, the appropriateness of selective culling, recognizing that evaluations involving the lethal take of California sea otters could not be permitted;

- the California Department of Fish and Game will be responsible for designing and carrying out a research program, using funds provided by the Fish and Wildlife Service, to evaluate the feasibility of humane, non-lethal methods to experimentally maintain the southern boundary of the mainland sea otter range in an area between Point Arguello and Point Conception; and

- the California Department of Fish and Game will initiate and/or support State legislation to implement appropriate restrictions on the use of gill and trammel nets in the translocation zone.

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

During the five years since the translocation was initiated in August 1987, 21 pups are known to have been born at the San Nicolas Island and 7 of these are believed to have survived to weaning. As of December 1992 an estimated 10-13 of the 139 otters translocated to San Nicolas Island remained at the island; 11 were known to have died; 10 had been recaptured in the Management Zone; and 32 had been resighted back in the mainland range. The fate of the remaining animals is unknown.

Containment — From September 1987 through December 1992 there were more than 100 reports of sea otters within the designated Management Zone. Some reports were of seals and sea lions, rather than sea otters, while others were repeated sightings of the same animals. During the period, a total of 16 adult sea otters and 3 pups were captured in and removed from the Management Zone.

In previous years, sea otters sighted in the Management Zone appeared to be transient, moving from place to place. Beginning in 1991, however, there were indications that animals were taking up residence in the nearshore waters of San Miguel Island. During an aerial survey in May 1991, nine adults and one pup were sighted around San Miguel Island. Since then, the Fish and Wildlife Service has captured and removed seven adult sea otters and two pups from waters around that island. An additional otter was captured and removed off Cojo Anchorage on the mainland in Santa Barbara County, also in the Management Zone. As of the end of 1992, a small group of otters remained in the San Miguel area, and at least one animal was consistently seen in the Cojo Anchorage area. The Fish and Wildlife Service is attempting to capture and remove additional animals that are regularly sighted in the Management Zone.

There also are indications that the range of sea otters along the mainland California coast is extending southward toward Point Conception. On 2 January 1991 three independent sea otters and a dependent pup were sighted near Purisima Point, about 12 miles north of Point Conception. During a shore-based count on 4 June 1991, eight independent sea otters and two pups were seen in this area. As of the end of 1992, this small colony appeared stable at 10-11 animals. Although none of the animals had a complete set of flipper tags, the tags present suggested that at least three of the animals likely were animals that had been translocated to San Nicolas Island.

Incidental Take in Fisheries — When the California sea otter population was listed as threatened in January 1977, it was assumed that its population size and range were increasing and would continue to increase at about five percent per year until all of the available habitat was reoccupied. As noted in previous annual reports, however, subsequent studies indicated that substantial numbers of sea otters were being caught and killed in coastal gillnet fisheries and that the incidental take had stopped, and possibly reversed, the population increase. In addition to sea otters and other marine mammals, thousands of seabirds and non-target fish species also were being caught and killed in these fisheries.

The State of California, recognizing the problems being caused by these non-selective fishing practices, enacted a series of regulations starting in 1982 to prohibit the use of gill and trammel nets in areas where seabirds, sea otters, and other marine mammals were likely to become entangled. The prohibitions have reduced the incidental take of sea otters and, as shown in Table 3, subsequent counts suggest that the population increase and range expansion have resumed. The restrictions did not, however, eliminate the incidental entanglement of sea otters. Therefore, in 1990, the State of California enacted legislation prohibiting use of gill and trammel nets in waters shallower than 30 fathoms throughout most of the sea otter range in the State.

Update of the Southern Sea Otter Recovery Plan — In 1989 the Fish and Wildlife Service reconstituted the Southern Sea Otter Recovery Team to review and recommend changes necessary to update the Southern Sea Otter Recovery Plan. This action was precipitated, in part, by the *Exxon Valdez* oil spill that occurred in Prince William Sound, Alaska, in March 1989.

The Recovery Team reviewed and subsequently recommended revision of the Recovery Plan. In response to the team's recommendations, the Fish and Wildlife Service developed a draft revised recovery

Table 3. California sea otter population counts by the Fish and Wildlife Service and the California Department of Fish and Game, 1982-1992

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

plan and in August 1991 submitted it to the Commission and others for review and comment. The Commission, in consultation with its Committee of Scientific Advisors, reviewed the draft revision and provided comments to the Service by letter of 8 November 1991. In its comments, the Commission noted that the draft Recovery Plan revision appeared to reflect four conclusions:

- the *Exxon Valdez* oil spill had demonstrated that (a) the entire southern sea otter range, including San Nicolas Island, could be contacted by a single large oil spill in or near the population's California range, and (b) efforts to contain a large oil spill and to capture and rehabilitate oiled otters are likely to be unsuccessful;

- efforts to establish the reserve breeding colony at San Nicolas Island have thus far been unsuccessful, and if successful in the future will not provide an adequate basis for removing the southern sea otter from the List of Endangered and Threatened Species;

- the only effective way to eliminate the risk of an oil spill endangering the southern sea otter population is to substantially increase the population's range and size; and

- the risk of endangerment as a result of oil spills will not be eliminated (*i.e.*, become insignificant) until the population's range has expanded north to the Oregon border and the population numbers at least 5,400 animals (60 percent of the estimated carrying capacity of the species' potential range in California, excluding San Francisco Bay and the area south of Point Conception).

The Commission noted that, while these conclusions seem intuitively reasonable, they were not adequately supported by the information and analyses in the draft Recovery Plan revision. For example, the draft revision did not indicate why the Fish and Wildlife Service and/or the Recovery Team believed that the threat posed by oil spills could not be effectively eliminated by altering tanker routes or taking other steps to reduce the risk of an oil spill in or near the California sea otter range, or by developing a more effective oil spill response plan and pre-positioning containment and clean-up equipment to reduce the possibility of sea otters' being impacted if an oil spill does occur. Further, the draft revision provided no explanation for the apparent determinations that (1) nothing can or should be done to expedite natural range expansion, and (2) only the present California sea otter range and coastal areas north to the Oregon border (excluding San Francisco Bay) should be considered in determining the optimum sustainable sea otter population. On a related matter, the Commis-

sion noted that the draft revision appeared to be proposing or recommending, but did not explain the rationale for, repeal of Public Law 99-625 and the related regulations and agreements that allowed establishment of the reserve breeding colony at San Nicolas Island, as well as maintenance of the southern boundary of the sea otter population at Point Conception to prevent adverse effects on shellfish and other fisheries in the Channel Islands and the California Bight.

In light of these uncertainties, the Commission recommended that a second draft of the proposed Recovery Plan revision be done and be provided to the Commission and others for review and comment before it is considered for adoption by the Service.

The Commission received no response to its 8 November 1991 letter or to the recommendation it contained. Therefore on 11 May 1992 the Commission again wrote to the Service, noting that, since it had not been advised otherwise, the Commission assumed that the Service was preparing a second draft of the proposed Recovery Plan revision, as recommended. In its letter, the Commission requested that, if this was not the case, the Service immediately advise the Commission, as required by section 202(d) of the Marine Mammal Protection Act, as to why the Service had not followed the recommendation.

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

At the end of 1992 the Fish and Wildlife Service had not yet completed the recovery plan revision.

Oil Spill — On 3 August 1992 a 12-inch pipeline, located on a bluff above Avila Beach, in San Luis Obispo County, California, ruptured, spilling approximately 125 barrels of crude oil into the ocean near the southern end of the current sea otter range. Approximately 50 sea otters were observed in the area at the time of the spill, and three animals were subsequently found dead. Necropsies carried out by the Fish and Wildlife Service indicated that two of the animals were killed directly by the spill and that oil may have contributed to the death of the third animal. Two other oiled sea otters were captured alive; one animal was examined and released on-site, and the other was taken to the Monterey Aquarium where it was cleaned, rehabilitated, tagged, and released into Monterey Bay.

The California Oil Spill Prevention and Response Office has initiated a study to assess possible impacts on other sea otters that might have been affected. As part of this study, blood samples were collected from 17 otters captured in and near the spill area in October 1992. Analysis of blood samples had not been completed as of the end of 1992. The second phase of this work will be to capture and take blood samples from a comparable number of otters in Monterey Bay. This work is a joint effort between the California Department of Fish and Game and the Fish and Wildlife Service.

The Alaska Sea Otter Population

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

The best available data indicate that there are 100,000 to 150,000 sea otters in Alaska. Although the population currently is large and growing, there are a number of existing and foreseeable threats and conservation issues. These include (1) conflicts with commercial, subsistence, and recreational shellfish

fisheries that have developed in the absence of sea otters; (2) incidental take in gillnet and other fisheries; (3) oil and gas development and transportation; (4) logging, mariculture, and other coastal development; (5) Native subsistence hunting; and (6) the increasing tourist industry in Alaska. The reality of these threats is illustrated by the 1989 *Exxon Valdez* oil spill, which is estimated to have directly killed 3,500 to 5,500 sea otters and may have long-term adverse effects on sea otter habitat in Prince William Sound and adjacent areas.

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

As noted in Chapter VIII, the Marine Mammal Protection Act, as amended in 1988, directs that the Secretaries of the Interior and Commerce develop conservation plans for depleted marine mammal species and populations. In amending the Act, Congress also suggested that the Secretaries consider developing plans for non-depleted marine mammals when doing so would benefit the species' conservation objectives. The Commission wrote to the Fish and Wildlife Service on 11 January 1989 suggesting that the Service prepare conservation plans for walruses, polar bears, and sea otters using the above noted species accounts as source documents. The Service advised the Commission on 3 March 1989 that it had begun developing a walrus conservation plan and intended to begin developing conservation plans for polar bears and sea otters in the near future. Efforts to develop the conservation plans, however, were delayed by the *Exxon Valdez* oil spill.

These efforts were discussed with representatives of the Fish and Wildlife Service during the 1991 annual meeting of the Commission and its Committee of Scientific Advisors in Bellevue, Washington. Service representatives indicated that limited staff and other constraints were delaying plan preparation. To help, the Commission offered to provide assistance by developing draft plans that could be used to expedite the planning process. The Service accepted the offer.

With regard to sea otters, the Commission organized and held a meeting in Anchorage, Alaska, on 25-26 September 1991 to identify key conservation issues from the perspective of different organizations. The meeting involved representatives of the Fish and Wildlife Service, the State of Alaska, the Native community, the fishing industry, and the environmental community. Following the meeting, the Commission prepared a working draft conservation plan and provided it to the meeting participants for review and comment.

Based on the comments received, the working draft was revised, and by letter of 5 May 1992 the Commission forwarded the revised draft Alaska sea otter conservation plan to the Fish and Wildlife Service. In its letter, the Commission noted that the draft plan provided a comprehensive review of activities affecting or potentially affecting sea otters and their habitat in Alaska, and identified research and management actions necessary to meet the intents and provisions of the Marine Mammal Protection Act.

The Commission noted its understanding that the Service had constituted an advisory group to help identify and resolve potential conservation problems regarding sea otters in Alaska. The Commission recommended that the Service provide the draft plan to the advisory group for its review and comment and use the draft plan and the comments received as the basis for preparing a final draft conservation plan for Alaska sea otters. The Commission further recommended that the final draft plan be circulated to the Commission and others for agency and public review prior to its adoption.

The draft conservation plan prepared by the Commission identified a number of research and management actions that should be afforded high priority. In its 5 May letter, the Commission noted that, while some of these activities may already be underway, it was not clear precisely what was being done or whether it was sufficient. For instance, with

respect to the 1989 *Exxon Valdez* oil spill, it was not clear what was being done to be better prepared to minimize and mitigate the effects of future oil spills. The Commission recommended that the Service, if it had not already done so, should evaluate actions that had been taken to assess, minimize, and mitigate the effects of the *Exxon Valdez* oil spill and related cleanup operations on sea otters and their habitat and, based on this evaluation, should develop a plan for assessing, minimizing, and mitigating the effects of possible future oil spills on sea otters. The Commission further recommended that the Service develop a draft contingency plan and distribute it to the Commission and others for review and comment.

As is also true in California, sea otters in Alaska may affect and may be affected by shellfish fisheries competing for the same resources. A possible solution to this may be some form of zonal management whereby sea otters and fisheries are afforded special protection in different areas. In its 5 May 1992 letter the Commission recommended that the Service, if it had not already done so, compile and evaluate available information on present and projected sea otter and human demographic patterns in Alaska. This would allow them to identify areas where conflicts may occur and where it may be desirable and feasible to regulate sea otters and/or human activities to avoid or minimize conflicts.

The Marine Mammal Protection Act's moratorium on taking does not apply to the taking of marine mammals by Alaska Natives for subsistence or handicraft purposes, provided the taking is not wasteful. However, there is uncertainty as to the numbers of animals being taken in different areas and whether any of the taking is wasteful or is depleting local subpopulations. The Commission therefore recommended that the Service, if it had not already done so, work with the Alaska Sea Otter Commission to ensure that Native hunters are fully aware of and are complying with the Service's marking and tagging regulations (see Chapter VIII). The Commission further recommended that the Service develop and implement a program to collect biological samples from animals taken by Alaska Natives.

In its letter the Commission pointed out that, if the Service decides to proceed with some form of zonal management, more reliable information will be needed on population distribution and abundance. In this regard the Commission recommended that the Service organize and convene a workshop to decide upon the sampling methodology and effort that would be required to first determine the maximum net productivity level of the Alaska sea otter population and, second, assure that it is not reduced below that level.

On 28 May 1992 the Regional Director of the Fish and Wildlife Service's Alaska Region wrote to the Commission, acknowledging receipt of the Commission's draft sea otter conservation plan. The letter noted that the draft plan had been provided to members of the Service's Sea Otter Management Planning Team and that it would be discussed at a team meeting scheduled for 4-5 June 1992.

With respect to the *Exxon Valdez* oil spill, the Director pointed out that the damage assessment program was formally ending and that proposed sea otter studies had not been approved for funding in 1992. The Service believed, however, that it was important to continue two of the sea otter studies and had therefore requested and received funding from the Department of the Interior headquarters office to do so. These were the sea otter beach walk survey, designed to assess ongoing mortality within the oil spill zone, and a pup survival study.

With regard to the Commission's recommendation concerning contingency planning, the Service noted that its Sea Otter Management Office in California is charged with developing oil and hazardous substances spill contingency plans for a number of species, and that a meeting had recently been held in Anchorage, Alaska, to initiate development of contingency plans for Alaska. Among the features to be included in the contingency plans is a detailed sea otter rescue manual that can be used in conjunction with training videos to enhance the Service's response capability in the event of a future oil spill.

In its 28 May letter the Service also noted that it was considering some form of zonal management as a way of resolving resource conflicts between sea

otters and people in Alaska. As a preliminary step, the Service indicated that it had asked the State of Alaska to provide all available data on subsistence and commercial use of shellfish resources. Once these data are in hand, they will be analyzed to identify areas of present and potential conflicts.

With respect to harvest monitoring and biological sampling, the Service indicated that it did not have a comprehensive sampling program for sea otters taken by Alaska Natives. It noted, however, that teeth were being collected and aged to determine population age structure. In addition, the Service indicated that it was embarking on a pilot program to place freezers for storing biological samples in Native villages from which residents hunt sea otters.

The Service also noted that it had completed a survey of sea otters in the Aleutian Islands in April 1992 and thus was in a position to develop a statewide population estimate. The Service further noted that the Alaska Fish and Wildlife Research Center was developing a census technique for sea otters that will permit estimates of regional populations within an acceptable level of statistical confidence. The survey technique was to be field-tested in the summer 1992 and was hoped to be ready for implementation in 1993. Finally, the Service noted that it was taking under advisement the Commission's recommendation that it convene a workshop to determine the maximum net productivity level of sea otters in Alaska.

On 12 October 1992 the Fish and Wildlife Service provided to the Commission and others a revised draft sea otter conservation plan, which drew heavily on the Commission's draft. It was the Commission's understanding that the document would be finalized and circulated for public review early in 1993.

Hawaiian Monk Seal (*Monachus schauinslandi*)

The Hawaiian monk seal is the most endangered seal in the United States and one of the two or three most endangered seals in the world. It occurs only in the Hawaiian Islands where its distribution is limited almost entirely to the small, mostly uninhabited chain of islands and atolls stretching 1,100 miles northwest of the main Hawaiian Islands (see Figure 1).

Hawaiian monk seals are centered around five major breeding islands and atolls in the Northwestern Hawaiian Islands. These are French Frigate Shoals, Laysan Island, Lisianski Island, Pearl and Hermes Reef, and Kure Atoll. Although some animals move between atolls, most animals continue to use beaches at the atolls of their birth for resting, molting, and pupping.

Of the five principal breeding locations, French Frigate Shoals, a group of small sand islets halfway along the chain, is by far the most important. About 40 to 50 percent of the total population and total number of births occur at this location, an amount about equal to the total number of births at the other four primary breeding sites combined. A few births also occur regularly at Niihau, Nihoa, Necker, and Midway Islands, and in 1991 two births occurred in the main Hawaiian Islands.

Little historical information is available on the Hawaiian monk seal population. There are no archeological or Polynesian records of seals from the main Hawaiian Islands although their presence there at the time of first human occupation seems reasonable. The first recorded observations of seals in the Northwestern Hawaiian Islands date from the early 1800s. Historical records suggest that, by the mid- to late 1800s, their numbers had been significantly depleted due to scavenging by shipwrecked sailors and bird hunters seeking exotic plumage, as well as by commercial sealing.

Background on Recovery Activities

In 1909 President Theodore Roosevelt designated the Northwestern Hawaiian Islands as the Hawaiian Islands Reservation to protect seabirds. Hawaiian monk seals also benefited from protection afforded by this action, and their numbers apparently increased significantly during the first half of this century. Later renamed the Hawaiian Islands National Wildlife Refuge, the area is now managed by the U.S. Fish and Wildlife Service.

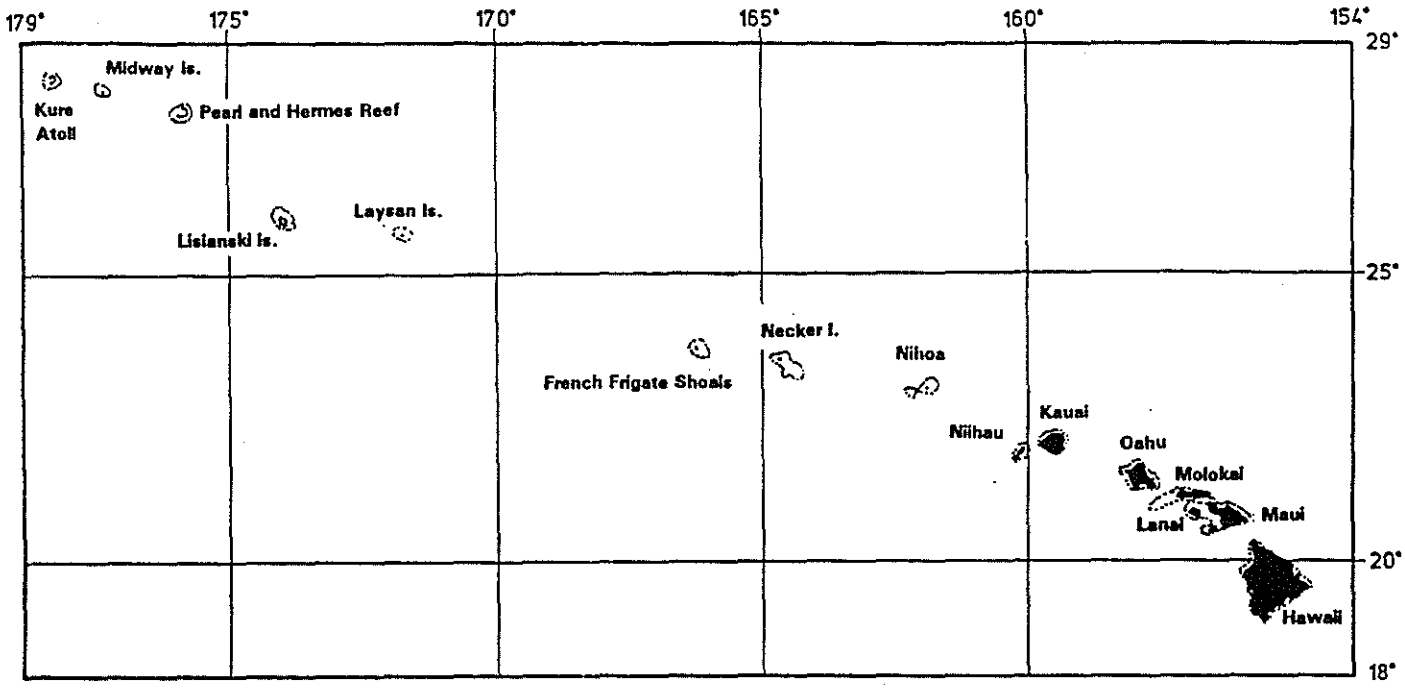

Figure 1. The Hawaiian Archipelago

The first systematic counts of Hawaiian monk seals were made in the late 1950s. Over the next 20 years monk seal numbers apparently declined by half. The U.S. military and Coast Guard personnel stationed at certain Northwestern Hawaiian Islands may have contributed to, if not precipitated, declines at some islands by disturbing seals hauled out on beaches during sensitive pupping, nursing, molting, and resting periods.

In light of the species' status, in 1975 the Marine Mammal Commission recommended to the National Marine Fisheries Service that the Hawaiian monk seal be listed as endangered under the Endangered Species Act and that certain breeding islands be designated as critical habitat. The Service acted promptly on the former recommendation, listing the species as endangered in November 1976. After extensive deliberations, in 1986 the Service designated the species' breeding islands and surrounding waters out to 10 fathoms as critical habitat. Consistent with the recommendations of the Commission, and later the Hawaiian Monk Seal Recovery Team (see below), the Service subsequently expanded the designated area out to 20 fathoms in 1988.

During the late 1970s the Service was unable to support all the studies necessary to initiate a recovery program for monk seals. The Commission therefore provided funding for certain field research to begin obtaining data on population parameters and trends. During this period, the Commission also convened a meeting to develop a five-year research plan for Hawaiian monk seals and recommended that the Service form a recovery team and prepare a recovery plan for Hawaiian monk seals pursuant to provisions of the Endangered Species Act. In 1980 the Service convened the first meeting of the Hawaiian Monk Seal

Recovery Team and early in 1983 it completed and adopted a final recovery plan for monk seals.

Beginning in the early 1980s Congress appropriated funds to the Service specifically for work on monk seals, and available support for needed recovery work increased substantially. Among other things, the Service used the increased funding to institute a long-term population monitoring program; begin a "head-start" project at Kure Atoll aimed at increasing survival of pups during their first months after weaning; rehabilitate underweight pups from French Frigate Shoals; document and minimize interactions with commercial fisheries; free entangled seals and clear beaches of debris that could entangle animals; and work with the Coast Guard and the Navy to reduce disturbance of monk seals on island beaches.

Based on the results of the Service's research program, it appears that the present monk seal population is about the same size as in the early 1980s — perhaps 1,500 to 1,600 animals. While it is encouraging that the population has not dropped further below the level reached in the early 1980s, trends over the past ten years underscore the species' continuing precarious state.

Following a brief increase in the number of seals in the mid-1980s, overall counts again declined late in the 1980s and early in the 1990s. Most of the recent decrease can be attributed to a decline of perhaps 20 to 25 percent in the number of seals at French Frigate Shoals and Laysan Island between 1988 and 1992. The decline at French Frigate Shoals is reflected by decreases in mean beach counts of juveniles, juvenile survival rates, and growth rates for pups and juveniles. The information strongly suggests this group has been limited by food availability. Unlike French Frigate Shoals, however, food does not appear to be a limiting factor at Laysan Island, and the cause of the decline there is not apparent. As discussed below, mobbing behavior by male seals has been identified as a factor preventing recovery of the seal population at this location.

Also during the recent decline, there was a marked decrease in the number of pups born. The decline occurred at most major breeding islands in 1989 and at all major breeding islands in 1990. In 1991 and 1992, however, the number of births increased at most locations to levels approaching those observed in 1988. These data suggest that a regional environmental phenomenon somehow may have affected the species throughout its range in 1989 and 1990.

Factors limiting the recovery of Hawaiian monk seals likely include a combination of human and natural causes that differ from island to island. Among these are interactions with commercial fishing gear and fishermen, declines in available prey due to over-fishing and natural environmental changes, entanglement in lost or discarded nets and other marine debris, human disturbance on haulout beaches, die-offs due to disease or naturally occurring biotoxins, shark predation, entrapment in a decaying seawall on Tern Island at French Frigate Shoals, and attacks on adult females and juveniles at Laysan and Lisianski Islands by overly aggressive groups of male seals attempting to mate (*i.e.*, "mobbing").

Hawaiian Monk Seal Program Review Follow-up

Since the late 1970s the Marine Mammal Commission and its Committee of Scientific Advisors have held a series of Hawaiian monk seal program reviews to evaluate progress on research and management activities and to identify priority needs. The reviews have been held in cooperation with the National Marine Fisheries Service, the Fish and Wildlife Service, and other involved agencies.

The most recent review was held on 5-6 November 1991 at the Service's Southwest Fisheries Science Center. It was scheduled prior to a Hawaiian Monk Seal Recovery Team meeting planned for 15-17 January 1992 in order to provide the team and the Service with an analysis of critical issues and priority needs. The results of the review were provided to the Service by letter of 20 December 1991, a copy of which was sent to each team member.

Points raised in the Commission's letter were reviewed during the Recovery Team meeting, which was attended by an observer from the Commission's Committee of Scientific Advisors. By letter of 11

March 1992, the Service replied to the Commission's recommendations. While there was agreement regarding many of the recommendations, some were not adopted and others were deferred for possible future consideration. In response, the Commission, in consultation with its Committee of Scientific Advisors, offered further comments to the Service by letter of 17 April 1992. Some of the principal issues examined by the Commission, the Service, and the Recovery Team in these meetings and letters, as well as follow-up actions taken in 1992, are discussed below.

Hawaiian Monk Seal Program Budget Priorities

The Commission's 20 December 1991 letter to the Service on the results of the monk seal program review noted that most program funding and personnel had been devoted to documenting population status and trends. While this work has been useful in identifying needed management actions, the Commission observed that the information base appears to have evolved to a point where greater emphasis could now more appropriately be placed on work more directly related to identified recovery needs. Examples of such needs include addressing the male mobbing problem, rehabilitating underweight pups to help rebuild certain populations, and resolving questions concerning food availability and foraging patterns. To permit greater efforts in these areas, the Commission suggested that consideration be given to reducing the level of monitoring at some locations and/or using less expensive monitoring approaches that would not require extended field camps at each island each year.

During the Recovery Team's January 1992 meeting, this point was considered along with plans for the coming year. The team concluded that, while means of collecting data more efficiently should be explored, support for annual field camps should continue to be a priority. In this regard, the team noted that each island group of seals appears to behave differently, that certain valuable information, such as survival rates, could not be collected without extended field camps, and that annual surveys at each island were needed to understand the factors responsible for population trends and to assess the effectiveness of restoration tasks.

The team also noted that extended annual field camps improve the ability to detect catastrophic events, such as a sudden die-off, to identify and remove overly aggressive males, and to free entangled animals. Finally, the team concluded that activities planned for 1992 with respect to mobbing behavior, rehabilitating underweight pups, identifying prey species and feeding areas, *etc.*, would not be significantly improved by the addition of whatever resources might be saved by reducing population monitoring.

The Service's 11 March 1992 letter reflected the team's views. It also noted that alternative monitoring techniques such as aerial surveys or satellite photogrammetry were reexamined on a regular basis and that alternate-year monitoring schedules might be appropriate for populations at Kure Atoll and Pearl and Hermes Reef. The Service indicated that it would continue to consider such approaches, but stated that it had decided to proceed with its planned field program in 1992 and to monitor all five major breeding sites as well as Midway Island, where new population restoration work was begun (see below).

Interactions with Commercial Longline Fishing

Early in 1990 several injured monk seals, as well as albatrosses, were found at French Frigate Shoals with hooks from longline gear embedded in their skins and with injuries suggesting interactions with fishermen or fishing gear. The observations coincided with a several-fold increase in the number of longline vessels fishing for swordfish near the Northwestern Hawaiian Islands. In response, the Western Pacific Regional Fishery Management Council and the National Marine Fisheries Service established a protected species zone within 50 nautical miles of the Northwestern Hawaiian Islands and between the islands. Longline fishing within this zone was prohibited in 1991.

There are almost no data on the distribution of monk seals at sea, and the Marine Mammal Commission has been concerned that interactions beyond 50 nautical miles also may occur. To assess the likelihood of such interactions, the Commission's December 1991 letter repeated earlier recommendations that steps be taken to place observers aboard longline

vessels fishing out to 100 nautical miles around the Northwestern Hawaiian Islands. The Recovery Team recommended that recent information from this fishery be reviewed in order to determine if there is a problem involving monk seal interactions and also recommended that, if swordfish move into the protected species zone, the Service seek help from the Coast Guard to prevent illegal fishing.

In response to these recommendations, the Service's 11 March 1992 letter indicated that it was confident that monk seals rarely travel beyond 50 nautical miles from the islands, but that it had placed an observer aboard one longline vessel fishing beyond 50 nautical miles in December 1991. It also indicated it would consider placing additional observers aboard vessels as opportunities and resources permitted. The Commission was subsequently advised that no monk seal interactions were reported during the December 1991 observer trip although it was not told where that vessel fished. As of the end of 1992, the Commission had not been advised whether additional observers had been deployed on longline vessels. During 1992, the Service found it unnecessary to seek Coast Guard help in monitoring fishing within the protected species zone.

To help determine whether monk seals move into longline fishing areas around the protected species zone and also to improve information on at-sea foraging and habitat-use patterns, the Commission's December 1991 letter also recommended that a pilot program be undertaken to radio-tag and track monk seals by satellite. The Service agreed with this recommendation and developed plans to test the feasibility of tracking monk seals with satellite-linked tags. At its meeting, the Recovery Team reviewed and endorsed the Service's plans. Subsequently, the Service tested satellite-linked tags with time-depth recorders on three sub-adult monk seals on French Frigate Shoals.

Preliminary findings suggest that satellite-linked tags with time-depth recorders are suitable for use on sub-adult and adult seals, but presently are too large for use on younger animals. While the sample size is too small to reach any definitive conclusions about habitat-use patterns, all three sub-adult males appear to have remained near their tagging location. Among other things, it is not clear how other age or sex classes or seals at other islands may differ with respect to range and habitat-use patterns. It is also not clear whether tags without time-depth recorders may be used on younger animals. At the end of 1992, the Commission looked forward to reviewing results of the tests, which were still being analyzed.

Interactions with Commercial Lobster and Bottomfish Fishing

Fisheries for lobster and bottomfish also occur on reefs in the Northwestern Hawaiian Islands, and direct interactions with monk seals have been reported in both fisheries. For example, seals are occasionally seen taking hooked fish from bottomfish fishing lines or near lobster fishing vessels. Both fisheries also have significantly reduced the stocks of target species. In this regard, lobster stocks in the Northwestern Hawaiian Islands are considered overfished. Although lobster and bottomfish are eaten at least occasionally by monk seals, their importance in the diet of different age classes of seals is unclear. As discussed in previous annual reports, the Commission has commented on relevant fisheries management plans for lobster and bottomfish.

In its December 1991 letter the Commission recommended that the Service reexamine its efforts to place observers aboard lobster and bottomfish fishing vessels, as well as longline vessels, to ensure that adequate information on interactions is being gathered. It also recommended that the Service (1) adopt an amendment recommended by the Western Pacific Regional Fishery Management Council to close the lobster fishery in the Northwestern Hawaiian Islands until lobster stocks in that area recover to optimum levels, and (2) consult with the Council to assess the potential effect that overfishing of lobster stocks might have on monk seal recovery and whether the optimum yield as defined in the lobster fishery management plan needs to be revised to address ecological factors and possible second-order effects on monk seals.

The Recovery Team recommended similar steps. It recommended that the Service pursue efforts to place observers aboard lobster fishing vessels and that

it reassess information on the lobster and bottomfish fisheries to identify actions that may be needed to address interactions between seals and fishing operations or fishery resource allocations.

The Service's 11 March 1992 letter noted that it planned to continue placing observers on bottomfish fishing vessels in the Northwestern Hawaiian Islands, but that in the absence of data indicating interactions with the lobster fishery, it did not plan to place observers on those vessels. Regarding the latter fishery the Service noted that on 7 February 1992 it had adopted the Council's recommendation to close the lobster fishery in the Northwestern Hawaiian Islands pending recovery of lobster stocks to optimum levels. The Service also noted that it had consulted with the Council, and while it recognized that there were few data on the importance of lobsters in the monk seal diet, it had concluded that lobster fishing did not have a significant effect on the availability of lobsters to seals.

In its letter of 17 April 1992 to the Service, the Commission questioned the basis for concluding that lobster fishing did not significantly affect the availability of lobsters. Regarding the Service's plans to continue placing observers aboard bottomfish fishing vessels, the Commission noted it was pleased that the program was being continued and asked that the results be provided as they became available. As of the end of 1992, the Commission had received no further information from the Service on these points.

Prey Consumption and Feeding Areas

As indicated above, food resources may be limiting recovery of monk seals at French Frigate Shoals, and prey availability may be affected by overfishing and natural factors. Information on monk seal prey species and feeding areas, however, is scant. The satellite-linked tracking studies noted above were recommended, in part, to help address uncertainties regarding feeding areas. In addition, the Commission's December 1991 letter recommended that the Service review available information on monk seal prey species, and based on the results of that review, undertake studies of the distribution, abundance, and productivity of prey species.

The Service shared these concerns, and for the 1992 field season developed plans to place VHF radio tags and time-depth recorders on seals in addition to those tagged with satellite-linked transmitters. It also planned to resume collections of scat and spew samples at all major breeding sites to identify prey taken by monk seals, to summarize similar data that had been collected in the past but had not been thoroughly analyzed and reported, and to investigate possible changes in reef fish composition. The Recovery Team reviewed and endorsed these plans and also recommended that the Service arrange for an assessment of whether oceanographic conditions had changed in recent years and how such changes might have affected productivity in the Northwestern Hawaiian Islands.

During 1992 the Service undertook work in all of these areas. Preliminary results of the depth-of-dive studies indicate that most dives were to depths less that 75 meters. Further results of this work and other investigations were being analyzed by the Service at the end of 1992.

Mobbing Behavior

As noted above, the death and injury of adult female and juvenile seals due to attacks by groups of male seals apparently attempting to mate have been identified as a major factor inhibiting recovery of seal populations at Laysan and Lisianski Islands. Adult sex ratios at both sites are skewed strongly towards males, and this is thought to be contributing to the behavior. To address the problem, the Service has developed plans to physically remove some males known to have been involved in mobbing incidents and/or to chemically treat such animals with a testosterone-suppressing drug to reduce their libido.

At the time of the Commission's November 1991 review, the results of preparatory work done by the Service had not been provided, and precise research plans were not fully presented. Therefore, while the Commission agreed that it was urgent to protect remaining female seals at these locations, it felt that it was not in a position to offer advice on the best or most appropriate approach. In its December 1991 letter, the Commission urged that the Service carefully

review its proposed course of action with the Recovery Team and proceed only with the team's endorsement. Given uncertainties concerning the effect and effectiveness of actions to manipulate mating behavior in the wild, the Commission also recommended that an additional behavior expert be added to the team.

During the January 1992 Recovery Team meeting, the Service provided relevant background information and alternative research options. Based on this information, the team endorsed a multi-year field trial at Laysan Island, to begin in 1992. For the first year, the plan called for treating 10 male seals with the testosterone-suppressing drug, treating 10 others with a placebo, establishing a control group of 10 other seals, which were not to be handled, and physically removing up to 10 males permanently from the island.

For 1993 the number of male seals treated will be determined on the basis of the number of female seals killed due to mobbing incidents in 1992. If one or no female seals are killed, 10 male seals will be treated in 1993. If two to seven females are killed in 1992, 50 males will be treated in 1993. If more than eight females are killed, the need for alternative measures will be considered. A similar course of action will be taken for the 1994 field season, with the number of male seals treated and/or removed to be determined by the number of female seals killed in 1993.

The team concluded that, while it would be difficult to detect the effects of this or any other considered approach in a clear, statistical way in the short term, the work should be done because of the expected resulting increase in survival of adult females.

During the 1992 field season the Service implemented the approach agreed upon during the Recovery Team meeting. The drugging experiment was carried out as planned; however, no seals were physically removed due to funding limitations. To help evaluate effects on the behavior of treated animals, the Service fitted both treated and control seals with time-depth recorders and collected blood samples to measure testosterone levels at the time the drugs were administered and again two to six weeks later. At the end of 1992, field trial results were being analyzed and plans for further work in 1993 were being reviewed. Four females are known to have been killed in 1992 due to mobbing injuries. Under the experimental design, this calls for 50 male seals to be treated with testosterone-suppressing drugs in 1993.

With respect to adding additional behavioral expertise to its membership, the team concluded that this would be unnecessary, given expertise already on the team. In this regard, the Service's 11 March 1992 letter noted that it planned to hold a meeting of behavioral experts during 1992 to review all data relevant to male mobbing to help define future research and mitigation measures. The contemplated meeting did not take place, however, and at the end of 1992 the Commission had not been advised as to when a meeting would take place or if it were still under consideration.

Closure of the Kure Atoll LORAN Station

In 1960 the Coast Guard established a LORAN navigation station on previously unoccupied Kure Atoll, the western-most of the Northwestern Hawaiian Islands. Aerial surveys at the atoll in 1958 produced maximum beach counts of Hawaiian monk seals well in excess of 100 animals, including more than 20 pups. Given the number of animals at sea at any one time, beach counts of monk seals usually represent well under half the adult and sub-adult animals. After 1960 the number of seals on Kure declined significantly until the mid-1980s. By that time, the total population at the atoll was estimated to number about 50 to 60 animals and the number of births reached an all-time low of one. As noted below, the number of seals at Kure has increased steadily since then due to efforts to protect pups, introduce additional female pups, and reduce human disturbance.

In 1991 the Coast Guard announced plans to close and dismantle the LORAN station on Kure Atoll at the end of 1992 and to return the island to the State of Hawaii. To minimize disturbance from demolition activities and to ensure that debris hazardous to seals is removed from the island, the Commission recommended in its December 1991 letter that the Service consult with the Coast Guard to review activities associated with closing the station. It also recommended that the Service place an observer on the

island during the principal work period to monitor compliance with seal protection measures. The Recovery Team also recommended these steps.

On 28 February the Coast Guard announced it planned to close the station six months earlier than anticipated — at the end of June 1992 instead of December. In response, the Commission wrote to the Coast Guard and the National Marine Fisheries Service on 12 March 1992 noting the need to accelerate consultations regarding the station's closure and repeating its previous recommendations.

On 18 May 1992 the Service advised the Commission that consultations were underway with both the Coast Guard and State officials. It noted that plans for demolishing and leaving the station would address points raised in the Commission's letter. The Service also noted that several other provisions, such as briefing workers on monk seal protection needs and declaring important seal areas as off limits, would be implemented.

In the spring of 1992 demolition work was undertaken and much of the debris was removed. A Service official was placed on the island to monitor demolition work, and in July the Coast Guard vacated the station. Some additional demolition work remains to be done in 1993. With the island once again uninhabited, human disturbance should be substantially eliminated, further improving prospects for the recovery of this group of seals.

Headstart and Pup Rehabilitation Projects

In 1981 the Service began a headstart project to reverse the above-mentioned decline in seal numbers at Kure Atoll. The decline appeared to be due to high mortality of juvenile animals during their first months of life. The Service also sought to bring into balance a sex ratio that had become strongly skewed towards male animals at this atoll. To address these problems, newly weaned female pups born on Kure were placed in a fenced enclosure on the beach, maintained there for several months, and then released back into the wild. The program was extremely successful. No pups died in captivity, and of the 33 pups released between 1981 and 1991, 24 were sighted in 1992.

To further increase numbers at this location, in 1984 the Service began a pup rehabilitation project. Under this project, underweight female pups on French Frigate Shoals judged to have a low probability of survival in the wild were removed for rehabilitation at facilities on Oahu and then moved to Kure for release back into the wild. This project, too, has been highly successful. Eleven of 20 seals released between 1984 and 1991 were sighted in 1992 at Kure and two others were seen at Midway Atoll. Females released from the headstart and pup rehabilitation projects now produce the majority of pups born on Kure, and both the total population and the number of pups born have increased steadily since the mid-1980s. The total population at Kure Atoll in 1992 was estimated to number about 90 animals, including more than 10 pups. In addition, the number of males and females at Kure is now equal.

In view of progress at Kure and the scheduled departure of the Coast Guard in 1992, the Service developed plans to suspend headstart and pup rehabilitation/release work there and to shift its efforts to Midway Atoll, about 120 kilometers east of Kure. Midway Atoll includes three principal islands — Sand, Eastern, and Spit. Sand Island, the atoll's largest, became permanently occupied in 1903 and was an important military base during World War II. The Navy continues to maintain a naval air facility on Sand Island. In 1958, counts of up to 68 seals were recorded at the atoll, most of which were on Eastern Island. In 1991, seal censuses at Midway Atoll yielded a mean beach count of five animals and two documented births. Plans for shifting work to Midway were reviewed and endorsed by the Recovery Team at its January 1992 meeting.

In the spring of 1992 Service personnel at French Frigate Shoals discovered that the number of young seals judged to be emaciated or underweight had increased alarmingly over numbers found in previous years. They also noted that mean beach counts had declined significantly and that this was apparently due to decreasing numbers of sub-adult and juvenile animals. Tests for signs of disease proved negative, and parasite loads appeared normal. The data did suggest, however, that the young animals apparently were unable to obtain sufficient food. The Service

summarized its findings in a report, and in July sought emergency authorization from the Service's Permit Office to move underweight animals directly to Midway Atoll for rehabilitation and release at that location. Given the decline in seal numbers at Midway Atoll, it was believed that food resources would be more plentiful there.

By letter of 5 August 1992 the Commission recommended that the Service proceed expeditiously with its plans. In its letter, the Commission agreed that the situation at French Frigate Shoals appeared to be due to limited food availability. In this regard, it noted that this could be due to one or a combination of at least three causes: recent increased predation due to an increase in the number of seals at French Frigate Shoals; overfishing of certain prey species; or natural perturbations that have acted to reduce prey abundance. The Commission urged that, if there was any question as to whether fishery development could be a cause of the reduction in food, the Service immediately take steps to stop fishing in this area until the uncertainty is resolved or to restructure the fishery to help obtain needed information.

During 1992, 24 underweight seals were collected at French Frigate Shoals for rehabilitation and eventual transfer to Midway Atoll. Although most were newly weaned pups and yearlings, some were two- and three-year-old seals. Of these 24 animals, six did not respond to treatment and died during rehabilitation, nine were released at Midway, and nine remained in captivity on Oahu for further rehabilitation at the end of 1992. In addition, six weaned pups taken from French Frigate Shoals and Kure Atoll in 1991 and rehabilitated on Oahu were released at Midway in 1992. Of the total of 15 seals released at Midway during 1992, 12 were believed to be alive at the end of the year.

Tern Island Cleanup and Seawall Repair

Tern Island, at French Frigate Shoals, is located in the middle of the Northwestern Hawaiian Islands, 500 miles west-northwest of Honolulu. It is the only permanently occupied field station in the Hawaiian Islands National Wildlife Refuge and is strategically vital for protecting Hawaiian monk seals, seabirds, and sea turtles.

In 1942 the Navy enlarged Tern Island, then an unoccupied 11-acre sand island, into a 37-acre island with several buildings and a 3,000-foot aircraft runway. To do so, it constructed a sheet metal seawall that was back-filled with sand and coral rubble. Roughly 20 large underground fuel storage tanks were also placed on the island at that time. Between 1952 and 1979 the Coast Guard occupied the island and operated a LORAN station there. Since then, the Fish and Wildlife Service has used the island as a field station.

In recent years the importance of the field station to the monk seal recovery program has been demonstrated in several ways. Its runway has been essential for timely evacuation of underweight seal pups and juveniles for rehabilitation and for the efficient movement of research staff. In addition, Service personnel, because they have been living on the island, have been able to document commercial fishery-related injuries to monk seals and have provided important assistance in monitoring the status of the French Frigate Shoals seal population which is, as noted above, the species' largest.

Tern Island's future, however, is in grave doubt. The seawall protecting the runway and buildings has deteriorated to the point that complete structural failure and massive erosion are imminent. If the runway is lost, permanent occupation will become too hazardous and the station will have to be vacated. Erosion pockets have already formed behind the disintegrating seawall and have created traps that threaten seals and sea turtles. In addition, the erosion has exposed cable and other debris hazardous to wildlife, including the underground fuel tanks, some of which still contained fuel.

To plan and organize urgent cleanup efforts and seawall repair, the Fish and Wildlife Service, the Commission, the Navy, the Corps of Engineers, and the National Marine Fisheries Service have cooperated on a number of measures. As noted in the previous annual report, efforts to remove remaining fuel, stabilize the fuel tanks, and make emergency repairs

on part of the seawall were undertaken in 1991. In addition, the Fish and Wildlife Service and the Corps signed an agreement late in 1990 for an engineering study to identify construction alternatives for restoring the seawall and rehabilitating the dock facilities. Unfortunately, the engineering study due in 1991 has yet to be completed and, therefore, the preferred engineering approach has not yet been selected. Since this has not happened, work has not gone forward on the design phase, during which detailed construction plans and specifications would be prepared prior to the actual construction. In short, nothing constructive appears to have been accomplished to address the critical issue of the deterioration of Tern Island. Based upon the 1990 agreement, it was entirely reasonable to have expected actual construction to have started in 1994. It now appears that 1995 is the earliest possible date that construction could begin.

During the Commission's 1991 program review, representatives of concerned agencies formed a working group to coordinate activities related to island cleanup and seawall repair. In its 20 December 1991 follow-up letter to the National Marine Fisheries Service, the Commission recommended that the Service provide assistance as needed to continue the coordination meetings among the agencies and to proceed with efforts to restore Tern Island. The Service's 11 March 1992 reply noted that it had continued to participate in informal working group meetings and that cooperative efforts to prepare necessary planning documents were proceeding.

As of the end of 1992, the Corps expected to provide its study of repair alternatives to the Service early in 1993. Funding necessary to proceed with the design phase had not yet been secured.

Entanglement in Marine Debris

Hawaiian monk seals, particularly pups, are attracted to derelict fishing nets and other marine debris that drift onto the islands and reefs of the Northwestern Hawaiian Islands. Once attracted to such material, animals may become entangled, leading to injury or death. Since 1985 four animals are known to have died in debris and others have been found so badly entangled that they likely would have died had researchers not freed them.

In 1992 observed entanglement incidents (13 animals) increased to levels approaching the highest recorded since data collection began in 1982. Although most animals were able to free themselves and no deaths were attributed to debris in 1992, researchers took steps to free 12 animals. As in past years most observed entanglements were on Lisianski Island (eight in 1992). To reduce the risk of entanglement, researchers routinely gather and destroy potentially hazardous debris found on the islands. As noted in Chapter VII, funding for efforts to free entangled animals and to destroy hazardous materials is provided by the Service's Marine Entanglement Research Program.

Recovery Team Activities

The Hawaiian Monk Seal Recovery Team was first constituted and convened by the Service in 1980. From 1984 to 1989, however, the Service did not convene any meetings. At the recommendation of the Commission, the Service reestablished the team late in 1989. Since then, the Service has supported annual meetings each winter to help assess plans for the coming field season.

Based on its review of program activities in November 1991, the Marine Mammal Commission concluded that the nine-member team would be strengthened if it were expanded to include a representative of the Fish and Wildlife Service's Hawaiian Islands National Wildlife Refuge as well as additional expertise in the fields of behavior (to help address questions regarding mobbing behavior) and physical oceanography (to help assess possible regional changes in environmental conditions). Recommendations to add appropriate individuals in this regard were included in the Commission's 20 December 1991 letter to the Service.

During its meeting in January 1992, the Recovery Team considered the Commission's recommendations and concluded that its current membership and size were optimal. The Service's 11 March 1992 response to the Commission echoed the team's view regarding

the recommended expansion. It noted, however, that a member of the Hawaiian Islands National Wildlife Refuge staff would be invited to attend future Recovery Team meetings. It also noted that expertise in the field of physical oceanography would be made available on a consulting basis at the team's request. As indicated above, in lieu of adding another behavior expert to the team, the Service planned to convene a separate meeting in 1992 to review matters related to mobbing. The meeting was not held during 1992.

At the end of 1992 a Recovery Team meeting scheduled for December 1992 was canceled by the Service due to limited funding. To ensure that a meeting was convened prior to the 1993 field season, the Commission therefore offered to provide funds to cover travel expenses of non-Service participants. With this assistance, the Service rescheduled the Recovery Team meeting for 4-5 January 1993.

Steller Sea Lion (*Eumetopias jubatus*)

Steller or northern sea lions inhabit coastal areas along the rim of the North Pacific Ocean from the Channel Islands in southern California through the Gulf of Alaska and Aleutian Islands to northern Hokkaido, Japan. In the United States, Steller sea lions are most abundant in the Aleutian Islands and Gulf of Alaska.

Available information indicates that the number of Steller sea lions has declined substantially throughout most of their range. Censuses of major rookeries and haulout areas in the Gulf of Alaska and Aleutian Islands in the United States and in the Kuril Islands in Russia indicate declines in some areas of more than 90 percent over the past three decades. These declines have occurred principally during the past ten years. Between 1985 and 1989, for example, the number of sea lions counted in the eastern Aleutian Islands declined by more than 60 percent. Numbers have remained stable in southeastern Alaska and southward, except for California, where they have declined. A summary of available data concerning past and present Steller sea lion numbers in the United States, Canada, and Russia is provided in Table 4.

The cause or causes of the decline are uncertain. Possibilities include over-exploitation of prey species, commercial hunting prior to 1972, subsistence hunting by Alaska Natives, incidental take in commercial fisheries, deliberate shooting and harassment at or near rookeries and haulout sites, and disturbance by boats and aircraft. Natural factors, such as changes in environmental conditions, predation by sharks and killer whales, and disease, also are possibilities.

In the central Gulf of Alaska, where the only long-term studies have been done, Steller sea lions seem to be growing more slowly and reaching sexual maturity later than in the past, suggesting that decreased food availability may be at least one of the causes of the decline. Decreased food availability may be due to human exploitation of important prey species, such as walleye pollock (*Theragra chalcogramma*), environmental change, or both.

Protective Actions

As noted in previous annual reports, the National Marine Fisheries Service designated the Steller sea lion as threatened under the Endangered Species Act in November 1990. In addition, the Service established a Steller Sea Lion Recovery Team to assess and provide advice on measures necessary to stop and reverse the population's decline.

The Recovery Team subsequently prepared a Technical Draft Steller Sea Lion Recovery Plan and, in March 1991, the Service asked the Commission for its comments on the document. The plan recommended "immediate actions...to reduce human-caused mortality to the lowest level practicable, protection of important habitats through buffer zones and other means, and enhancement of population productivity by ensuring that there is an ample food supply available." To implement these recommendations, the draft plan recommended several research and conservation actions, including (1) identifying habitat requirements and protecting areas of special biological significance; (2) identifying management stocks; (3) monitoring the status and trends of the species; (4) monitoring the health, condition, and vital parameters of the species; (5) assessing and minimizing the causes of mortality; (6) investigating feeding ecology and factors affecting

Table 4. Steller sea lion counts at rookeries and other major haulouts in the United States, Canada, and Russia, 1956-1992

Geographic Area	1956-1962	1975-1980	1982-1986	1989	1990	1991	1992	% Change Earliest to Latest Count
Russia								
Kuril Islands	14,076	—	8-12,000	3,615	—	—	—	-75
Kamchatka Peninsula	15,000	10-15,000	8-12,000	3,082	—	—	—	-80
Commander Islands	12,592	4,578	3,500	890	—	—	—	-93
Okhotsk Sea	5,000	1,200	1,500	900	—	—	—	-82
Robben Island	200	—	—	200	—	—	—	0
Alaska								
Western Aleutians	17,910	27,228	—	9,516	—	2,411	2,868	-84
Central Aleutians	31,040	41,677	25,759	7,759	8,711	7,499	6,396	-79
Eastern Aleutians	52,530	23,922	10,802	3,145	4,875	4,231	4,839	-91
Bering Sea	7,000	4,950	1,000	667	—	—	—	-91
Central and Western Gulf of Alaska	59,470	45,594	31,056	14,094	14,274	10,007	9,437	-84
Eastern Gulf of Alaska	—	7,053	—	7,241	5,444	4,596	3,738	-47
Southeast Alaska	7,000	6,376	6,898	8,471	7,629	7,715	7,557	+8
British Columbia (three rookeries)	11,500	3,500	4,000	4,000	—	—	—	-65
California, Oregon, and Washington								
California, Oregon, and Washington	8,000	5,410	4,500	4,000	—	—	—	-50
Farallon Islands	—	110	75	49	97	—	—	-12
Año Nuevo	1,334	1,497	1,169	—	458	—	—	-65
Oregon	—	1,214	2,019	1,854	2,569	—	—	+53

Sources of Count Data:

Alaska Department of Fish and Game. Unpublished data.

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energetic status; and (7) implementing the Recovery Plan and coordinating recovery activities.

On 11 April 1991 the Recovery Team recommended that the National Marine Fisheries Service designate all Steller sea lion rookeries and major haul-out sites throughout Alaska, Washington, Oregon, and California as critical habitat. The Recovery Team also identified sites in British Columbia and the Kuril Islands for inclusion in the critical habitat designation and recommended that the National Marine Fisheries Service, through the State Department, work with the Governments of Canada and Russia to protect Steller sea lion habitat.

On 13 May 1991 the Commission provided comments to the National Marine Fisheries Service on the draft Recovery Plan. The Commission recommended that the Service complete and adopt the plan as quickly as possible and immediately begin implementing it. Comments on the draft plan provided by the Commission and others were transmitted to the Recovery Team, and on 3 October 1991 the team forwarded a revised draft recovery plan to the National Marine Fisheries Service. By the end of September 1992 the Service had not adopted the Recovery Plan or designated critical habitat, as recommended by the Recovery Team. Therefore, by letter of 29 September 1992 the Commission requested a status report on the Recovery Plan and recommended that the Service act promptly to adopt the plan and designate critical habitat.

On 5 October 1992 the Service's Office of Protected Resources advised the Commission that the Steller Sea Lion Recovery Plan was to be accorded the highest priority of all recovery and conservation plans then in preparation, and that the Service was targeting the plan for approval by the end of October and publication by the end of the year. The Commission wrote back on 8 October 1992 asking that the Service advise it as to what actions it planned to take regarding the critical habitat designation and the future of the Recovery Team. On 8 October 1992 the Commission also wrote to the Director of the Service to underscore its hope that the schedule for completing and adopting the Recovery Plan described in the Service's 5 October 1992 letter would be met.

On 30 December 1992 the Service approved and adopted the Steller Sea Lion Recovery Plan. It is expected to be available in January 1993.

During the summer of 1992 the National Marine Fisheries Service and the Alaska Department of Fish and Game conducted aerial surveys of Steller sea lions throughout their range in Alaska. By memorandum of 1 October 1992 the chairman of the Recovery Team advised the team members of the results of the surveys. The memorandum noted that the survey results indicated that sea lion numbers continued to decline in 1992 (see Table 4).

A number of research and management efforts, in addition to the aerial surveys noted above, were initiated or continued in 1992. On 9-10 November 1992 a meeting was held at the National Marine Mammal Laboratory in Seattle to review these efforts. The meeting included representatives of the Marine Mammal Commission, the Steller Sea Lion Recovery Team, the National Marine Fisheries Service, the Alaska Department of Fish and Game, the Oregon Department of Fish and Wildlife, Canada's Department of Fisheries and Oceans, and several university researchers.

With respect to research, meeting participants noted the success of ongoing efforts, including use of satellite tracking to locate possible feeding areas; genetic and physiological studies to determine stock discreteness and food requirements; hydro-acoustic and trawl studies to determine, among other things, potential prey and the depths at which pups and juvenile sea lions may feed; and the use of a geographic information system for data management. Participants also noted informational and educational efforts planned or underway, including identifying no-fishing zones around Steller sea lion rookeries on charts produced by the National Oceanic and Atmospheric Administration and the Federal Aviation Administration; a newsletter on research and management efforts to be published by the National Marine Mammal Laboratory; radio and video news stories, public service announcements, a feature video story, posters, and a calendar to be produced by the Alaska Department of Fish and Game; information on the Steller sea lion situation to be included in commercial fisheries regulation booklets, also produced by the

Alaska Department of Fish and Game; and pamphlets, posters, and signs produced and distributed by the Oregon Department of Fish and Wildlife.

Immediately following the program review, the Steller Sea Lion Recovery Team met to evaluate progress and identify additional research and management needs. The team noted that, although the National Marine Fisheries Service, as of mid-November 1992, had not adopted the Recovery Plan or designated critical habitat, as had been recommended, almost all of the high-priority items identified in the research section of the draft Recovery Plan had been initiated. The team concluded that, if funding is continued at present levels, the current research program should provide the data necessary to evaluate the effectiveness of measures necessary to stop and reverse the population decline. The team endorsed the educational programs underway at various agencies, but noted that the materials distributed often did not provide the rationale behind actions being taken. The team therefore recommended that future educational efforts include better explanations of why various actions are needed. The team also noted a lack of emphasis on enforcement and recommended that the Steller sea lion recovery coordinator prepare an information package for enforcement officers.

Steller Sea Lion-Fisheries Interactions

As noted above, a possible cause of the observed Steller sea lion decline is the exploitation of prey species, particularly walleye pollock, by commercial fisheries. In June 1991 the National Marine Fisheries Service took several actions to mitigate the adverse effects of fisheries on Steller sea lions in Alaska. At that time the Service prohibited groundfish trawling within 10 nautical miles of 18 Steller sea lion rookeries in the Bering Sea and Gulf of Alaska, allocated area catch quotas for walleye pollock to divert fishing effort away from sea lion foraging habitat, and placed limits on the total amount of walleye pollock that could be harvested in any quarter of the year.

On 18 November 1991 the Service issued a proposed rule to make these measures permanent. On 23 January 1992 the Service issued a final rule expanding the proposed rule to prohibit trawling year-round within 10 nautical miles of 37 Steller sea lion rookeries in the Bering Sea and Gulf of Alaska. In doing so, it also extended the buffer zone around the Steller sea lion rookeries at Akutan, Akun, Seguam, and Adligadak Islands and Sea Lion Rock from 10 to 20 nautical miles during the species' pupping season from 1 January to 15 April of each year.

However, in addition to taking the above actions in 1991, the Service also increased total allowable catch of walleye pollock in the Gulf of Alaska to 103,600 metric tons — an amount 30,000 metric tons greater than its 1990 catch limit. This action was inconsistent with advice provided by the Steller Sea Lion Recovery Team, and on 26 June 1991 the Sierra Club Legal Defense Fund, on behalf of Greenpeace and several other environmental groups, filed a lawsuit (*Greenpeace* v. *Franklin*, formerly *Greenpeace* v. *Mosbacher*) in the U.S. District Court for the Western District of Washington.

The suit alleged that the National Marine Fisheries Service had violated the Endangered Species Act by improperly finding that the authorized 1991 pollock catch level was not likely to jeopardize the continued existence of the Steller sea lion and by failing to use the best scientific and commercial information available to determine the total allowable catch. Plaintiffs also contended that the Service's conclusion that the 1991 pollock catch would not have significant environmental impacts and its decision not to prepare an environmental impact statement on the action violated the National Environmental Policy Act.

On 10 October 1991 the district court ruled in favor of the Federal defendants. Greenpeace appealed the ruling to the United States Court of Appeals for the Ninth Circuit on 11 October 1991. The appellate court issued its opinion affirming the decision on 29 December 1992. The court ruled that the Service's conclusion that the 1991 pollock fishery would have no significant environmental impacts was supported by adequate evidence. The court also found that the Service's "no jeopardy" biological opinion was supported with "ample data and analysis."

Sea Lion Rock

Sea Lion Rock is a small rock outcropping within the Copalis National Wildlife Refuge and Washington

Islands Wilderness Area on the outer coast of Washington. It is used as an occasional haulout site by California sea lions and harbor seals, and Steller sea lions have been observed in the area. It is also used by many species of seabirds and waterfowl.

As discussed in previous annual reports, the U.S. Navy has had, throughout World War II and again continuously since 1949, the permission of the Department of the Interior to conduct practice bombing on Sea Lion Rock. These activities entail the use of inert ordnance generally weighing 25 pounds or less. The Commission, in letters of 8 February 1991 and 9 May 1991, advised the Navy and the Fish and Wildlife Service, respectively, that the Navy's use of Sea Lion Rock for practice bombing was incompatible with conservation of wildlife on the island. In its letters the Commission noted, among other things, that (1) the Navy's use of Sea Lion Rock conflicted with the islands status as part of a wildlife refuge and a wilderness area as well as with its pending designation as part of the Olympic Coast National Marine Sanctuary, and (2) the practice bombing is inconsistent with provisions of the Marine Mammal Protection Act, the Endangered Species Act, and the Migratory Bird Treaty Act, all of which pertain to wildlife species found on and near Sea Lion Rock. The Commission recommended to the Navy that it cease all practice bombing at the site and recommended that the Fish and Wildlife Service suspend the Navy's permission to use the island.

The Navy, by letter of 8 March 1991, and the Fish and Wildlife Service, by letter of 3 June 1991, advised the Commission that they were undertaking reviews of the situation. On 18 May 1992 the director of the Fish and Wildlife Service wrote to the Service's regional director for Region 1, the area which includes Sea Lion Rock, regarding the Navy's activities. The letter, citing national defense considerations, stated that a decision had been made "not to elevate this issue or to recommend to the Secretary [of the Interior] that the existing letter of permission be canceled." The letter recommended that the regional director develop a written agreement with the Navy to "clearly identify those actions that will be taken to minimize disturbance to wildlife," including "improved marking of islands, enhanced compliance with flight operation plans and periodic monitoring of bombing activities and the effects on wildlife." Although the Navy is sensitive to concerns about its use of Sea Lion Rock, to date, it has been unable to find an alternative site for its training needs. The Navy states, however, that its operations plan for the Sea Lion Rock area has been modified in recognition of the sensitivity of the area.

On 22 October 1992 the Natural Resources Defense Council and the Sierra Club Legal Defense Fund, on behalf of Defenders of Wildlife and several other environmental organizations, filed suit (*Defenders of Wildlife* v. *Lujan*) in the U.S. District Court for the Western District of Washington against the Department of the Interior, the Fish and Wildlife Service, and the Navy. The suit challenges the Navy's use of a national wildlife refuge and wilderness area for practice bombing and charges the Department of the Interior and the Fish and Wildlife Service with failing to enforce and thus being in violation of provisions of the National Wildlife Refuge System Administration Act and the Wilderness Act. Plaintiffs also claim the Navy is violating the provisions of the Marine Mammal Protection Act that prohibit taking of marine mammals without authorization. As of the end of 1992 the Navy was applying for incidental take permits under both the Marine Mammal Protection Act and section 7 of the Endangered Species Act.

The plaintiffs are seeking to halt all practice bombing on Sea Lion Rock by enjoining the Fish and Wildlife Service from allowing the Navy to undertake such activities and by enjoining the Navy from "harassing or otherwise taking marine mammals in the Sea Lion Rock area without complying with the procedural and substantive requirements of the Marine Mammal Protection Act."

The Federal Government's answer to the complaint in this case is due to be filed by 19 February 1993.

Harbor Seal in Alaska (*Phoca vitulina*)

Harbor seals inhabit temperate and sub-arctic coastal waters in the North Pacific and North Atlantic Oceans and contiguous seas. In the North Pacific,

they occur nearly continuously along the Pacific Rim, from San Ignacio Lagoon, Baja California, Mexico, north through southeastern Alaska, and west to the Bering Sea, the Aleutian, Commander, and Kuril Islands, and south to Hokkaido, Japan.

In the early 1970s approximately 270,000 harbor seals were estimated to occur in the coastal waters of Alaska. Although there is no current statewide estimate, counts made since the early 1970s at certain harbor seal rookeries and haulout sites in the Gulf of Alaska and Bering Sea indicate significant declines in some areas. In 1988 the Commission published a review of current information on the biology, ecology, and status of harbor seals in Alaska as part of a report on a number of Alaska marine mammals (see Appendix B, Lentfer 1988). This species account indicated a dramatic decline in the number of harbor seals in parts of Alaska.

To help document population trends, in 1990 the Commission provided funds to the Alaska Department of Fish and Game to count harbor seals on Tugidak Island in the central Gulf of Alaska. Tugidak was believed to have the largest concentration of harbor seals in the world as recently as the mid-1960s when up to 20,000 seals hauled out on the island. By the mid-1970s, however, the average count had declined to fewer than 7,000 seals. The 1990 survey found fewer than 1,000 animals, a decrease of 86 percent since the mid-1970s. Additional anecdotal information collected by the National Marine Fisheries Service suggests that these numbers may be indicative of harbor seal population trends throughout the Kodiak Archipelago.

The reason for the decline is unknown. Mass mortalities of harbor seals due to disease have been observed in recent years at locations outside Alaska. In 1979-1980, 450 harbor seals along the New England coast succumbed to an influenza virus, and in 1988 phocine distemper killed approximately 17,000 harbor seals in the North Sea and Baltic Sea. Other maladies have afflicted harbor seals to lesser degrees both within and outside of Alaska, including herpes virus, *Leptospira* spp., *Chlamydia psittaci*, San Miguel sea lion virus, Tillamook (bovine) calicivirus, and seal pox. Of these, only the San Miguel sea lion virus and seal pox have been reported in harbor seals in Alaska, and the effects have been either minor or undetermined. Further, there have been no reports of diseased animals at Tugidak Island, where the decline in harbor seal numbers has been most prominent.

Commercial and bounty hunting no doubt affected harbor seal numbers in Alaska prior to passage of the Marine Mammal Protection Act in 1972. Since 1889 or earlier, harbor seals were taken commercially for their pelts and meat and, at various times, under a bounty program to reduce perceived conflicts with fisheries. Harvests increased from 6,000-10,000 animals in the 1930s and 1940s to 40,000-60,000 animals in 1964-1966 when commercial demand for seal skins was at its peak. The harvest size decreased significantly beginning in 1967, reaching a low of between 8,000 and 12,000 animals in 1972 when the harvest was banned with the passage of the Marine Mammal Protection Act. The fact that numbers have decreased rather than increased since the mid-1970s suggests that commercial and bounty hunting are not the cause of the decline.

Harbor seals also are taken for subsistence purposes by Alaska Natives. Although data on the annual subsistence take of harbor seals are sketchy, some estimates indicate that as many as 2,000-3,000 animals may be taken each year. Beginning in 1992 the National Marine Fisheries Service initiated statewide monitoring surveys of Native subsistence use of marine mammals in Alaska. Over time, this monitoring should accurately identify levels of subsistence use of harbor seals and potential effects of that use on seal numbers in different parts of Alaska.

A number of other activities may be affecting harbor seals in Alaska, including reduction of prey species by commercial fisheries and the incidental take of seals in fishing gear. Disturbance by boat and aircraft traffic and activities related to offshore oil and gas exploration, and the release of contaminants such as polychlorinated biphenyls (PCBs) and heavy metals into the environment also may affect the seal populations. The similarity between the harbor seal and Steller sea lion declines in Alaska, and the fact that the Steller sea lion decline may be related to nutritional factors, suggest that the harbor seal decline may also be food-related.

To obtain and evaluate the most up-to-date information available, the Commission contracted in 1991 for an update of the 1988 harbor seal species account. At the end of 1992, the report was undergoing final review; it is expected to be published in 1993.

With respect to the National Marine Fisheries Service's efforts to develop a conservation plan to assess and describe what should be done to stop and reverse the harbor seal decline in Alaska, the Commission wrote to the Service on 29 September 1992 urging it to conclude a contract with the University of Alaska to develop a draft harbor seal conservation plan. By letter of 5 October 1992, the Service advised the Commission that (1) all existing data indicate a significant decline in harbor seal numbers throughout the Gulf of Alaska; (2) a conservation plan for harbor seals in the region is necessary; (3) it had contracted with the University of Alaska to develop the conservation plan; and (4) it would appoint a harbor seal review team, to include personnel from the Alaska Department of Fish and Game and the Service's National Marine Mammal Laboratory and Office of Protected Resources. The Service further noted that it had developed a draft harbor seal status review that it will use, along with the Commission's 1988 harbor seal species account, as background for the conservation plan, and that it hoped to have a draft plan completed by the end of 1992. At the end of 1992 the Service had not completed the conservation plan. The Commission's updated species account with research and management recommendations will be made available to the Service early in 1993.

Northern Fur Seal (*Callorhinus ursinus*)

Northern or North Pacific fur seals occur seasonally in waters along the North Pacific rim from California to Japan. Some animals also use pelagic waters of the North Pacific Ocean, presumably for feeding. Major breeding locations occur on Robben Island and the Kuril Islands in the Okhotsk Sea, in the western Bering Sea on the Commander Islands, and on the Pribilof Islands in the eastern Bering Sea. The species' largest breeding colonies are on St. Paul and St. George Islands in the Pribilof Islands and represent about three-fourths of the total number of northern fur seals worldwide.

The Pribilof Islands fur seal population is estimated to have numbered 2 to 2.5 million animals as recently as the early 1950s. This number is thought to equal the population size before exploitation began in the mid-1700s. Over the past four decades, however, the population has declined significantly. From the late 1950s to the mid-1980s, the number of fur seals on the Pribilof Islands experienced a net reduction exceeding 50 percent. An even greater decline was observed at Robben Island. Population estimates from 1983 placed the number of seals on the Pribilof Islands at about 877,000 animals. In 1988 the population was designated as depleted under the Marine Mammal Protection Act. Data from 1990 indicate that the population has increased since then to slightly more than 1,000,000 animals. This appears to be due primarily to an increase in the number of male fur seals resulting from the cessation of the commercial fur seal harvest in 1984 (see below for discussion of the fur seal harvest).

Causes of the observed declines since the late 1950s are only partly known. As discussed in past annual reports, several factors may be contributing to the decline and subsequent weak recovery of northern fur seals. For instance, a harvest of more than 300,000 female fur seals between 1956 and 1968 reduced the number of breeding adults and nursing females. This is believed to have been the major cause of declines through the early 1970s. It does not, however, explain the continuing decline observed during the early 1980s.

A second factor may be entanglement of fur seals in marine debris, particularly net fragments and packing bands. The data on the scope and effect of entanglement on fur seals are equivocal. Observed annual declines in the Pribilof Islands of 4-8 percent between the mid-1970s and the early 1980s appeared to be largely due to juvenile mortality during the first years of life at sea. Although initially attributed largely to entanglement, direct evidence to support this conclusion was weak. Observed entanglement rates of juveniles on land in the 1970s and 1980s were generally at or below 0.4 percent. This does not, however, take into account fur seals that became

entangled and died at sea where mortality is unlikely to be observed and is more likely to occur. Some entanglement studies in the late 1980s suggested that fur seal pups readily interact with and become entangled in debris, and that entanglement-related mortality could have been greater than 14 percent in the late 1970s and early 1980s.

A third factor may be incidental take in large-scale driftnet fisheries that began operating on the high seas of the North Pacific Ocean in 1978 and expanded rapidly thereafter. Data on the number of fur seals taken in high seas driftnet fisheries prior to 1990 are almost nonexistent. Monitoring programs since 1989 have provided some useful data; however, they have not yet been analyzed fully with regard to potential fur seal incidental take levels. As discussed in Chapter IV, a global moratorium on high seas driftnet fisheries took effect after 31 December 1992. This should largely eliminate the effect of high seas driftnet fisheries on fur seals. However, driftnet fishing may continue or intensify in Russia's Exclusive Economic Zone.

A fourth factor in the decline may be the reduction of food resources for fur seals in the North Pacific. Although data for related factors such as body size and growth indicate otherwise, a decrease in fur seal prey species due either to over-fishing or natural factors, such as climate change, cannot be ruled out. It is conceivable that a depletion in food supplies in an area of particular importance to one or more age and sex classes of fur seals may be a significant factor.

Other factors that may have influenced population trends over the past four decades include toxic contaminants, disease, and predation. There are few data to suggest that these have been significant.

Subsistence Harvest

Northern fur seals were harvested commercially for their pelts from the 1700s until 1984. On the Pribilof Islands, they are now taken only for consumption by Aleut residents. As noted in previous annual reports, the nations involved in commercially harvesting fur seals managed seal herds under a series of international agreements during most of the 20th century. Between 1957 and 1984 northern fur seals were managed cooperatively by the Governments of Canada, Japan, the Soviet Union, and the United States under provisions of the Interim Convention on Conservation of North Pacific Fur Seals. The interim convention sought to maintain fur seals at a population level that would provide the greatest annual harvest, with due regard for the productivity of other living marine resources. The convention lapsed in 1984 when the United States Senate declined to ratify a protocol to extend it. As a result, management authority in the United States became subject to domestic laws, including the Fur Seal Act of 1966 (16 U.S.C. § 1151 *et seq.*) and the Marine Mammal Protection Act. Under the latter Act, commercial harvesting of fur seals is prohibited and subsistence harvesting has been limited to the Aleut residents of the Pribilof Islands.

The subsistence harvest is regulated by the National Marine Fisheries Service under the Fur Seal Act and the Marine Mammal Protection Act. The regulations developed under these laws require that, before each year's harvest, the Service estimate the number of seals needed for subsistence purposes by Native residents of the Pribilof Islands. To develop this estimate, the Service considers the previous year's harvest levels, economic conditions in the Aleut communities, and the size of the Aleut population. Once the estimated minimum number of seals for a given harvest is taken, the harvest is suspended until the Service determines whether subsistence needs have been met or whether an additional take of seals is required. Subsistence harvest levels from 1985 through 1992 are shown in Table 5.

In the 28 May 1992 *Federal Register* the Service solicited comments on proposed estimated take levels for the 1992 Pribilof Islands fur seal subsistence harvest. The Service estimated that Native subsistence needs in 1992 would be met by a take of between 1,645 and 2,000 seals on St. Paul Island and between 281 and 500 seals on St. George Island. On 3 August 1992, the Service published final estimates for the subsistence fur seal harvest in the *Federal Register*. The final estimates were unchanged from proposed estimates of 28 May. As noted in Table 5, the 1992 subsistence harvest totals were 1,482 seals on St. Paul Island and 194 seals on St. George Island.

Table 5. Subsistence harvest levels for northern fur seals in the Pribilof Islands, 1985-1992[1]

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

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

During 1992 the Service also took steps to modify measures governing the way in which the subsistence harvest is carried out. Previously on 5 November 1991 the National Marine Fisheries Service held a meeting with representatives of interested Federal and State agencies, Aleut residents of the Pribilof Islands, other Alaska Native groups, and environmental and animal welfare groups to review and re-evaluate the methods used to determine subsistence needs and measure waste as they apply to subsistence harvests of fur seals on the Pribilof Islands. The purpose of the meeting was to gather information and recommendations to help identify future changes to the harvest management regime. As of the end of 1992 the Service had not circulated a final report on the results of the meeting. However, on 31 July 1992 the Service published a final rule in the *Federal Register* that eliminates the option to extend the Pribilof Islands fur seal subsistence harvest beyond 8 August each year.

In its *Federal Register* notice, the Service stated that it was taking this action in order to provide better protection for female fur seals. Since 1985 subsistence harvests, like commercial harvests before them, have been limited to sub-adult males taken on St. Paul and St. George Islands between the end of June and the second week of August. During this period, juvenile male seals occupy areas separated from the areas used by adult breeding seals. In early August immature female seals, which are difficult to distinguish from immature males, begin arriving at the rookeries in large numbers and intermixing with the juvenile males. In past years, extension of the harvest beyond the first week of August has resulted in the take of a small number of juvenile female seals. To offset the effect on Aleut sealers of eliminating the option to extend the seal harvest beyond 8 August, the Service's final rule advanced the earliest start-up date for the harvest from 30 June to 23 June.

Northern Fur Seal Conservation Plan

As discussed in previous annual reports, the Marine Mammal Commission recommended to the National Marine Fisheries Service in 1984 and again in 1985 and 1986 that the Pribilof Islands fur seal population be designated as depleted under the Marine Mammal Protection Act. The National Marine Fisheries Service did so in June 1988. In a November 1985 letter on the matter, the Commission also recommended that the Service prepare a conservation plan, similar to a recovery plan required for endangered or threatened species under the Endangered Species Act, to help identify and direct priority research and management actions needed to restore the population.

Following up on its recommendation, on 6 December 1985 the Commission sent the Service a suggested step-down outline of research and management tasks to include in the plan. For several years, no action was taken on the Commission's recommendation regarding the conservation plan. In 1988 the Marine Mammal Protection Act was amended to require that conservation plans be developed for all species or populations of marine mammals listed as depleted under the Act. The amendments specifically directed the Service to prepare a conservation plan for northern fur seals by 31 December 1989.

The Service forwarded its draft fur seal conservation plan to the Commission in March 1990. On 23 April 1990 the Commission provided extensive comments, noting, among other things, that the Service's plan failed to address management actions

needed to restore the fur seal population. The Commission recommended that the document be substantially revised and recirculated for review and comment. The Commission received no response to its comments and recommendations until 5 October 1992 when the Service forwarded another draft plan to the Commission for review and comment.

The Commission reviewed the revised draft, and on 11 November 1992 provided comments to the Service. The Commission noted that, while the plan followed the outline suggested by the Commission in 1985, the description of work to be done under most tasks was ambiguous. In many cases, work under different tasks seemed to overlap and it was often not clear whether it involved collection of new data or analysis of existing data. The Commission therefore recommended that the Service redraft the narrative portions of the plan to provide a more complete and self-explanatory description of the work being prepared under each task. It also recommended that the step-down outline be expanded to include tasks to develop a geographic information system and to coordinate and oversee plan implementation.

As of the end of 1992 the Commission was awaiting further information from the Service regarding its plans for completing a fur seal conservation plan.

Pacific Walrus (*Odobenus rosmarus divergens*)

The Pacific walrus is one of two or perhaps three subspecies of walruses. It inhabits the Bering and Chukchi Seas between Russia and the United States. Based on censuses conducted in 1980 and 1985, the Pacific walrus population at those times was estimated at 246,000 and 234,000 animals, respectively. A more recent population estimate based on a 1990 survey found the population to number at least 201,000 animals; however, that number is considered an underestimate due to survey sampling difficulties. As a result, it is not known how much the population size may have changed since the 1985 survey.

Other walrus populations are distributed around the Arctic Ocean in a series of isolated groups. These are usually regarded as belonging to a single subspecies, the Atlantic walrus, *O. r. rosmarus*. Among other differences, the Atlantic walrus is slightly smaller than the Pacific walrus. The population groups are concentrated off northwestern Canada and western Greenland, along the east coast of Greenland, around Svalbard and Franz Josef Land in the Barents Sea, and off the northeastern and north-central coasts of Russia. Some scientists consider the group of walruses off north-central Russia in the Laptev Sea to be a third subspecies, *O. r. laptevi*. All these populations are very small compared to the Pacific walrus population. Together they represent only 10 to 20 percent of the total number of walruses worldwide.

Historically all populations were exploited and reduced to very low numbers. In this regard, since the late 1700s the Pacific walrus went through at least three cycles of intense exploitation, population decline, and subsequent recovery. Today it is the only walrus population that has substantially recovered from the effects of over-hunting.

Although nearly the entire life cycle of walruses is spent at sea, only 65 to 75 percent of the time is spent in the water. Animals frequently haul out on ice or land to rest, bear their young, and molt. Most Pacific walruses migrate north in the spring and south in autumn, moving with the seasonal advance and retreat of the pack ice. Some animals, however, remain year-round in the Bering Sea and Bristol Bay. Mating takes place mainly in winter, and calving occurs about 15 months later in spring.

Walruses feed on organisms that live on the sea floor. They use their snout and vibrissae to root for clams, their principal prey, as well as snails, amphipods, and worms. They also have been observed to eat seals, but this is considered unusual.

Preparation of a Walrus Conservation Plan

In 1988 Congress amended the Marine Mammal Protection Act to authorize the Secretaries of the Interior and Commerce to develop conservation plans for non-depleted marine mammals. Like recovery plans for endangered species, conservation plans are intended to help identify and coordinate research and

management activities necessary to conserve the species.

At about the same time, the Marine Mammal Commission completed work on a series of species accounts with research and management recommendations for ten species of marine mammals in Alaska, including walruses (see Appendix B, Lentfer 1988). The Commission forwarded those accounts to the Fish and Wildlife Service on 11 January 1989. In its transmittal letter, the Commission recommended that the Service use the walrus species account as the basis for preparing a conservation plan for the population off Alaska. The Service replied positively in March 1989; however, the *Exxon Valdez* oil spill and other demands on Service staff in the ensuing months prevented progress on drafting a plan.

To help speed development of a plan, the Commission offered to contract for the preparation of a draft walrus conservation plan. The offer was discussed during a review of Alaska marine mammal issues held at the Commission's 1991 annual meeting in Bellevue, Washington. Service participants in the review noted that they remained committed to the planning effort, and shortly after the meeting the Service accepted the Commission's offer. Shortly thereafter the Commission contracted for development of a draft plan.

The contractor's draft plan was reviewed by the Commission and its Committee of Scientific Advisors late in 1991 and was judged to provide a sound basis for moving ahead with the planning process. It included a thorough review of walrus biology and conservation issues. It also addressed specific tasks to monitor population status and trends, define the optimum sustainable population level, monitor Native subsistence harvests, and coordinate Federal, State, Native, industry, and international efforts to conserve the Pacific walrus population.

The Commission forwarded the draft walrus conservation plan to the Service on 23 December 1991. At that time, the Commission recommended that (1) the draft plan be circulated for review and comment by the Service's Walrus Management Plan Advisory Team; (2) the Service prepare a final draft conservation plan based on the Commission's draft and comments received from the advisory team; and (3) the final draft plan be circulated by the Service to the Commission and others for agency and public review prior to adoption.

On 5 February 1992 the Service replied, expressing its appreciation to the Commission for contributing to the planning process. It also advised that a meeting of the Walrus Management Plan Advisory Team was scheduled for 13 February to review the Commission's draft plan, that the draft had been sent to team members to help them prepare for the meeting, and that during 1992 the Service would be placing high priority on management planning for walruses, as well as polar bears and Alaska sea otters.

During the advisory team's 13 February meeting, members agreed that the draft plan provided a useful basis for the Service to develop a conservation plan for walruses, and it suggested changes that the Service should take into account. A schedule was suggested for completing a final draft plan by June 1992 although it was understood that the schedule might be difficult to meet. It also was agreed that a separate implementation plan should be developed in conjunction with the conservation plan. The purpose of the implementation plan would be to set forth task priorities and cost estimates and to identify cooperative work by agencies and groups able to assist in carrying out certain important tasks.

Because of work required to reestablish a walrus harvest monitoring program in the spring of 1992 (see below), the Service's staff was unable to meet the schedule for completing a draft conservation plan or an implementation plan by June. However, the Eskimo Walrus Commission, an organization representing Alaska Native walrus hunters, was particularly interested in working with the Service on walrus research and management and expressed its willingness to help develop the implementation plan.

In view of these developments, the Marine Mammal Commission agreed to provide funds to secure the services of a biologist familiar with walrus management needs. His task is to work with the Eskimo Walrus Commission to help the Service complete and implement the conservation plan, develop a cooperative agreement between the Service and the Walrus Commission to manage walruses, and explore a

possible U.S.-Russian agreement on walrus conservation (see Chapter X). Advice on the contents of the implementation plan was subsequently provided to the Service late in 1992. As of the end of 1992 it was the Commission's understanding that a draft walrus conservation plan and implementation plan would be made available by the Service to the Commission and others for review in January 1993.

Subsistence Harvests of Walruses

Walruses, like a number of other marine mammals, constitute an important traditional subsistence resource for Native peoples in coastal Alaska and eastern Siberia. They provide food and raw materials essential for survival in the far North, and walrus ivory is used to make traditional native handicrafts that are important to the economies of Native villages. For these reasons, the Marine Mammal Protection Act provides an exception to the moratorium on taking marine mammals. Under the exception, Alaska Natives may harvest marine mammals, including walruses, for traditional subsistence and handicraft purposes, provided it is done in a non-wasteful manner.

Native hunters use boats and rifles to harvest walruses hauled out on ice or land. Most animals taken by Alaska Natives are harvested early in the spring as the animals follow the retreating pack ice north into the Chukchi Sea. Data on Native harvest levels from 1970 to 1989 are shown in Table 6. Because an unknown number of animals that are shot escape mortally wounded and sink without being retrieved, the data in this table do not include all animals killed in the harvests. An estimate from the 1960s (the most recent available) suggests that perhaps 40 percent of the animals killed in the Alaskan harvest are not retrieved.

Information on harvest levels since 1989 is uncertain because the Fish and Wildlife Service suspended its walrus harvest monitoring program in 1990 and 1991 due to funding constraints. As a result, the only harvest data gathered in 1990 and 1991 were from a program begun by the Service late in 1988 to mark and tag walrus tusks as a way to help prevent illegal trade (see also Chapter VIII). In 1990 and 1991 the Service tagged tusks from 1,458 and 2,143 animals, respectively. Because calves and other animals without tusks need not be tagged and because some hunters may have been reluctant to participate in the new program or uncertain of how to do so, it is not clear how data for these years compare with harvest data for earlier years.

Data on subsistence harvests, as well as biological samples from harvested animals gathered as part of the walrus harvest monitoring program, have been a fundamental component of past walrus research and management efforts. For this reason, when the Commission wrote to the Service on 23 December 1991 transmitting the draft conservation plan, it also recommended that the Service take immediate action to re-institute the walrus harvest monitoring program. In its 5 February 1992 reply, the Service advised the Commission that it had received a supplemental appropriation from Congress that would be used to reestablish a walrus harvest monitoring program.

The program was instituted in time for the 1992 spring hunt, and individuals were placed in three major walrus harvesting villages to monitor the harvest during the peak hunting season. Although the 1992 effort was not as extensive as the earlier program, the Service plans to continue the current level of monitoring in 1993 and to expand coverage to additional villages beginning in 1994. The program also has enabled the Service to renew collection of biological samples from harvested animals. To help expand monitoring efforts in the future and to involve coastal village residents, the Service also instituted a program to train Native villagers in the procedures for collecting harvest data and biological samples.

As of the end of 1992 results of the 1992 harvest monitoring program were not yet available. Tusks from 1,527 walruses were tagged under the Service's marking and tagging program in 1992. Recent data on Russian walrus harvests are not available. As shown in Table 6, from 1985 to 1989 Soviet hunters took an average of 4,184 animals a year.

Other Activities

In addition to the recommendations noted above, in its 23 December 1991 letter the Commission urged

Table 6. Estimated annual harvests of Pacific walruses in Alaska and the Soviet Union, 1970 to 1989[1]

Year	Alaska Harvest	Soviet Harvest	Total Harvest
1970	1,422	988	2,410
1971	1,915	897	2,812
1972	1,325	1,518	2,843
1973	1,581	1,291	2,872
1974	1,410	1,205	2,615
1975	2,378	1,265	3,643
1976	2,989	1,253	4,242
1977	2,377	1,461	3,838
1978	2,224	2,120	4,344
1979	2,745	1,526	4,271
1980	2,625	2,653	5,278
1981	3,518	2,574	6,092
1982	2,557	3,569	6,126
1983	2,261	3,946	6,207
1984	4,930	4,424	9,354
1985	3,903	4,708	8,611
1986	3,205	3,884	7,089
1987	2,735	4,673	7,408
1988	2,567	3,974	6,541
1989	1,008	3,679	4,687

1 This table is based on data collected through harvest monitoring programs conducted by the Alaska Department of Fish and Game from 1970 through 1979 and by the Fish and Wildlife Service from 1980 through 1989. Alaska harvest estimates for 1978-1989 were extrapolated from a subsample of catches at selected villages.

action on a number of walrus research and management issues. Follow-up to those recommendations and other matters are discussed below.

Planning for Future Population Surveys — In light of the poor results of the 1990 joint U.S.-U.S.S.R. walrus survey, the Commission's December 1991 letter recommended that another walrus survey be undertaken as soon as possible and that a planning meeting be held to determine the least expensive way to obtain useful estimates of the walrus population size and trends. At the end of 1992 it was the Commission's understanding that the Service, through a cooperative research agreement with the University of Maine, was completing an analysis of the effectiveness of aerial surveys for estimating the size of the walrus population. The results suggest that the utility of population-wide censuses may be limited and that alternative methods of detecting population changes are needed. To assess the matter further, the Service is considering the possibility of convening a meeting of scientists in 1993 to examine results of the analysis. Given the high cost of range-wide surveys and limited funding for walrus research and management activities in Russia as well as in the United States, the earliest possible date for another census appears to be 1995, assuming it is determined to be an effective means of population assessment.

Other Research — In 1992 the Service's research efforts were devoted to synthesizing available data from U.S.-U.S.S.R pinniped research cruises from the early 1970s through 1991. Among other things, the data are being used to assess age-specific reproduction, blubber thickness, and other indices of the condition of the walrus population. Tissue samples from walruses taken during subsistence and commercial harvests in U.S. and Russian areas were analyzed using genetic research techniques to identify possible stock differences. Also, a handbook was under development to standardize methods for collecting and analyzing reproductive tracts. The Service's field research in 1992 was limited to (1) a cooperative study with Norwegian scientists to test new satellite transmitters for tracking walruses and (2) continued cooperation with the State of Alaska and the Togiak National Wildlife Refuge staff to monitor walrus haulout patterns on Cape Peirce and Round Island in northern Bristol Bay.

Fisheries Interactions — The Commission's December 1991 letter also repeated a recommendation made several times in the past that the Service pursue actions to close waters to commercial groundfish trawlers out to three miles around walrus haulout grounds in the Togiak National Wildlife Refuge. As discussed in previous annual reports, noise from groundfish trawlers operating near walrus haulout beaches on Round Island, Cape Peirce in the Togiak National Wildlife Refuge, and certain other beaches in northern Bristol Bay may have caused declines in the number of walruses hauling out at those locations.

To reduce the amount of noise reaching haulout beaches from fishing operations, and at the recommendation of the North Pacific Fishery Management Council, the National Marine Fisheries Service closed Federal waters between 3 and 12 miles around these locations for three years, beginning in 1989. A rule to close those areas indefinitely was proposed late in 1991 by the National Marine Fisheries Service, again at the recommendation of the North Pacific Fishery Management Council. The rule was adopted early in 1992. Because the closure did not include State waters within three miles of shore (the National Marine Fisheries Service does not have authority over these areas), an apparent regulatory gap existed that could compromise the effectiveness of the rules.

Although the Fish and Wildlife Service did not advise the Commission as to what actions, if any, were taken to raise the matter with responsible State officials, the Commission subsequently learned that, early in 1992, the Alaska Board of Fisheries adopted a rule closing all State waters in the Bristol Bay area to trawling and dragging. The reasons cited for the action were to prevent the bycatch of salmon, herring, and halibut and to protect nearshore and intertidal fisheries habitat. Protection of walruses was not mentioned as a concern. Nevertheless, the new State rule, in combination with the Federal regulation, prohibits groundfish trawling within 12 miles of the principal walrus haulout sites in northern Bristol Bay.

The Commission's letter also recommended that the Service assess the need to protect other Bristol Bay walrus haulout sites from effects of fishing and other human activities. As of the end of 1992 the Commission had not been advised by the Service as to what steps were being taken or planned in this regard. It is expected, however, that the matter will be addressed early in 1993 in the Service's draft conservation plan.

Enforcement — Marine mammals, including walruses, have been taken illegally in order to sell tusks, hides, and other valuable marine mammal parts on the black market. Over the years, the Fish and Wildlife Service has implemented vigorous enforcement efforts to prevent such illicit trade. In 1992 the Service completed an undercover operation that resulted in the confiscation of several hundred pounds of ivory as well as other marine mammal parts. As of September 1992, 29 persons had been charged with violations of the Marine Mammal Protection Act and other laws, 20 had pleaded guilty, and other individuals were expected to be charged. Five persons were found guilty of wastefully taking walruses. The Service remains committed to continuing active enforcement efforts.

International Walrus Workshop — As an outgrowth of discussions between U.S. and Soviet walrus experts during the course of collaborations in the late 1980s under the U.S.-U.S.S.R. Agreement on Environmental Protection, an international workshop on the ecology and management of walrus populations was organized and convened in March 1990. The workshop, sponsored principally by the Marine Mammal Commission and the Fish and Wildlife Service, involved scientists and managers from Canada, Greenland, Norway, the Soviet Union, and the United States.

The purposes of the workshop were to review information on walrus populations worldwide and to encourage international communication and cooperation on related activities. The workshop successfully achieved its objectives. The workshop report (see Appendix B, Fay *et al.* 1991) provides an overview of the status of various walrus populations as well as a summary of recent work and identified research and management needs. Among other things, participants in the workshop agreed that similar workshops should be held in the future to continue to facilitate the cooperation and effective information exchange initiated by the meeting.

The Canadian Department of Fisheries and Oceans subsequently volunteered to host a second meeting, and during 1992 it scheduled a Second International Walrus Technical and Scientific Workshop, to be held 11-15 January 1993 in Winnipeg, Manitoba. The tentative agenda includes a review of actions taken in response to recommendations developed at the 1990 workshop and assessments of work on tagging and tracking walruses, censusing walrus populations, and monitoring contaminants. The Commission will send a representative to the meeting.

Northern Right Whale (*Eubalaena glacialis*)

Centuries of commercial hunting for right whales have made the northern right whale the world's most endangered large whale. One or more populations still survive in each of the North Atlantic and North Pacific Oceans; however, northern right whales may now number fewer than 400 animals worldwide.

In the western North Atlantic Ocean, right whales occur seasonally in at least five locations. They are found along the coast of Georgia and Florida in winter; in Cape Cod Bay and in the Great South Channel off Massachusetts in spring; in the Bay of Fundy near the U.S.-Canadian border from summer through early fall; and off the southern tip of Nova Scotia from spring through fall. Where most of the population goes in winter, however, is unknown. The only known winter habitat lies within a few miles of the coasts of Florida and Georgia and its use is limited principally to mature females with newborn calves, females about to give birth, and a few juvenile animals. Photo-identification studies over the past 15 years indicate that the whales using these five areas are part of a single population numbering about 350 animals. At present, this group appears to represent the species' best chance for survival.

In the eastern North Atlantic Ocean, where right whales were first commercially exploited on a regular basis, the species appears to have been extirpated. Harvesting of right whales began there in the 11th century by Basque fishermen operating along the coasts of present-day Spain and France and continued through the first third of this century. Over the past 60 years, there have been only about 10 reliable accounts of right whales off the coasts of western Europe and the Azores and Madeira. Most of these records are of single animals, and none involves more than two animals. These reported animals may have been stragglers from the western North Atlantic.

In the North Pacific Ocean, the species' status may not be much better. The full force of commercial whaling was brought to bear abruptly on North Pacific right whales stocks in the mid-1800s when Yankee whalers discovered the North Pacific whaling grounds. By the end of the century, northern right whales in the Pacific were commercially extinct and close to biological extinction. In the past 50 years, right whale sightings, strandings, and catch records in the North Pacific are so few and so widely scattered that there is no basis for assessing how many animals remain. There are no known locations in the North Pacific basin or adjacent seas where right whales can be found, and for the past several decades there have been no reports of calves. Northern right whales could disappear from the North Pacific Ocean by the end of this century.

Although belatedly, right whales were the first whales to receive international protection from commercial hunting. The first International Convention for the Regulation of Whaling, which entered into force in 1935, prohibited the hunting of right whales, a ban that was accepted by most whaling nations. This prohibition was carried forward by the International Whaling Commission under the 1946 International Convention for the Regulation of Whaling and has been accepted by all whaling nations for several decades. Right whales also are listed on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, designated as endangered under the U.S. Endangered Species Act, and considered as depleted under the U.S. Marine Mammal Protection Act.

Despite nearly 60 years of protection from whaling, the number of northern right whales remains perilously low. Because information on their abundance in the first half of this century is almost nonexistent, it is not clear whether or at what rate their numbers may have changed since then. Thus, it is not known if the present population estimate of some 350 animals in the western North Atlantic Ocean reflects a substantial increase, a further decrease, or an equivalent number of whales compared to the size of this population in the 1930s when international protection from whaling began.

Although population trends in recent decades are uncertain, it is likely that, for at least some stocks, recovery has been retarded by human activities other than whaling that have killed or injured animals and degraded essential habitat. Because of the extremely small number of whales remaining and because mature

female right whales bear only a single calf every two to four years at most, the premature loss of even a single animal can have a major effect on population recovery. In this regard, evidence from strandings along the east coasts of the United States and Canada indicates that at least 10 North Atlantic right whales have been killed over the past 20 years by collisions with large vessels or entanglement in commercial fishing gear. Similarly, one of the few recent records of a right whale in the North Pacific Ocean is of a dead animal found on the southern tip of Russia's Kamchatka Peninsula in October 1989. Wrapped around its tail stock was a 20-meter length of salmon gillnet.

Right whales also may be affected by human activities that do not cause direct physical harm. For example, vessel noise and disturbance may alter normal behavior, cause stress, and perhaps induce animals to leave or avoid preferred habitat. Right whales and their habitat also may be affected adversely by dredging and dredge spoil disposal, exploration and development of offshore petroleum and hard mineral resources, oil spills, municipal outfalls, whale research, whale-watching activities, and perhaps other human activities.

Right Whale Research

Intensive research on right whales in the western North Atlantic Ocean began early in the 1980s. As discussed in previous annual reports, the Commission played an important role in helping encourage, support, and direct these research efforts. Among other things, it supported studies to assess the status of right whales (see, for example, Appendix B, Hain 1992, and Appendix C, Winn 1984, Winn *et al.* 1985, and Brownell *et al.* 1985) and to help identify needed research and management activities (see, for example, Appendix B, Kraus 1985 and Kraus and Kenney 1991, and Appendix C, The Georgia Conservancy 1986).

Right whale research received a major boost in 1986. That year Congress appropriated $500,000 to the National Marine Fisheries Service to initiate a long-term program of research by a consortium of non-governmental research organizations formed to study right whales along the Atlantic coasts of the United States and Canada. Since then Congress has appropriated from $230,000 to $250,000 a year to the Service to continue the consortium's right whale studies. In addition to these funds, several Federal agencies, particularly the Minerals Management Service, the Army Corps of Engineers, and most recently the Navy have supported right whale studies. These cooperative efforts have enabled scientists to monitor right whales in all five areas off the United States and Canada known to be used regularly by right whales, develop a photo-identification catalogue of individual animals, investigate and necropsy dead beach-cast right whales, collect tissue samples for genetic and other types of analyses, and develop and maintain a computerized data management system.

To review recent research results and other matters pertaining to western North Atlantic right whales, the National Marine Fisheries Service convened a workshop on 14-15 April 1992 in Silver Spring, Maryland. Scientists engaged in right whale research reviewed the recent data and briefly summarized their findings in a workshop report distributed by the Service in October 1992. Among other things, the report notes that as of the end of 1991, 317 individual right whales, four of which are known to have died, had been identified and catalogued. This photo catalogue has proved a valuable source of information.

For instance, the belief that the remaining right whales in the North Atlantic Ocean are part of a single population is supported by photographic evidence from two whales. One animal photographed off southeast Greenland in 1987 was re-photographed off southern Nova Scotia in 1989. Another animal, photographed as a calf off Georgia and in the Labrador Basin in the winter of 1988-1989, was re-photographed as a juvenile in the Bay of Fundy in the summer of 1990. The photo catalogue also provides an age record for one whale of at least 55 years. The record is based on an adult female photographed with a calf off Florida in 1935 and re-photographed off Massachusetts in 1959, 1989, and 1992.

Data from dead stranded animals, as well as pictures of live animals that have been particularly well photographed, have been used to assess interactions between whales and ships and entanglement in fishing gear. Evidence from propeller wounds or attached debris suggests that, of the 25 right whales known to

have stranded along the eastern U.S and Canadian coasts from 1970 through 1989, five animals died due to collisions with ships and three from entanglement in fishing gear. Based on visible scarring, 11 percent of the well-photographed animals in the catalogue (22 of 196 animals) bear scars, such as propeller slashes, indicative of ship collisions.

Recent radio-tracking and genetic studies also are providing valuable new information. The radio-tracking studies indicate that rapid, wide-ranging movements of individuals may be common. One female accompanied by a calf traveled 3,800 km over a 43-day period. Genetic work on tissue samples from approximately half of the whales in the photo catalogue has identified three matrilineal lines within the population. Other new information reported by participants in the workshop included analyses of historic whaling data, trends in the distribution and abundance of whales at known habitat areas, trophic relationships, and reproductive rates.

An emerging research capability using airships (or blimps) also is improving methods for estimating whale abundance, studying whale behavior, and identifying the presence of whales in areas of human activity. The Commission first provided funds to help assess airship capabilities for whale research in 1991 and provided additional support in 1992. The results indicate that airships are useful for obtaining data not easily collected from other research platforms (see Appendix B, Hain 1992).

For Fiscal Year 1992 Congress appropriated $230,000 to the National Marine Fisheries Service to carry forward studies by the right whale research consortium. In addition, as noted in Chapter X, the Commission provided partial support for a study to document and evaluate factors related to an apparent unusual absence of right whales and other cetaceans from the Great South Channel in 1992. The report of the study is expected in 1993.

As of the end of 1992 no field work was scheduled for 1993. Instead, the Service expected to use any Fiscal Year 1993 funds as may be appropriated by Congress for right whales to analyze and prepare reports on the results of recent research.

Northern Right Whale Recovery Plan

In 1984 the Marine Mammal Commission recommended that the National Marine Fisheries Service prepare recovery plans under the Endangered Species Act for endangered whales occurring in U.S. waters. With respect to right whales, the Service responded by constituting a Recovery Team for the species in 1987. At that time, it also began drafting a right whale recovery plan. In reviewing an initial draft plan in 1988, the team concluded that substantial revisions were needed and offered to redraft the plan. The Recovery Team's revised draft plan was circulated by the Service for public and agency review early in 1990. In circulating the document, the Service noted that the plan did not necessarily reflect its views; neither did the Service indicate its views as to the plan's contents.

The Commission, in consultation with its Committee of Scientific Advisors, commented to the Service on 22 March 1990, noting that the goals, objectives, and task statements in the plan were not developed in a way that offered clear guidance regarding needed action. The Commission therefore recommended that the plan be reformatted and suggested a revised outline for doing so. In light of comments by the Commission and others, the Service agreed that the plan should be revised. The Commission offered to assist in revising the plan and, by letter of 21 November 1990, the Commission forwarded a revised draft plan and suggested that, in view of the substantial revisions, it be circulated for agency and public review as the Service's proposed plan.

Among other points, the revision identified steps necessary to monitor right whale occurrence and habitat use patterns in known high-use areas; improve the salvage and necropsy program for right whales; develop and implement area, seasonal, gear, and other fishing restrictions in important right whale habitat; establish public awareness programs to advise vessel operators of ways to reduce the likelihood of vessel-whale collisions in areas where right whales occur most frequently; consider vessel speed restrictions in areas where right whales occur frequently; designate critical habitat for right whales; establish interim whale-watching regulations setting forth allowable approach distances for right whales; limit approval of

right whale-related research permit applications to studies that would further the objectives and provisions of the approved Right Whale Recovery Plan or involve essential research whose beneficial results would outweigh likely adverse effects on the whales; and oversee essential work.

On 25 April 1991 the Service wrote to the Commission, advising that it concluded that the Commission's suggested draft plan placed too much emphasis on research, that information was sufficient to begin management actions, and that it would draft another version and send it to the Right Whale Recovery Team for review. In March 1992 the Service distributed a final Recovery Plan to the Commission and others. The final draft plan, which was little changed from the Recovery Team's 1990 draft plan, was not circulated for review and generally failed to address most of the Commission's comments. For example, the step-down outline and task descriptions were not revised to clearly describe precisely what work is contemplated, whether cost estimates are appropriate or reasonable, or whether task priorities are properly assigned.

Recovery Plan Implementation

As noted above, the National Marine Fisheries Service convened a workshop on 14-15 April 1992 to consider information on the western North Atlantic right whale population. Scientists active in right whale research and representatives of concerned Federal and state agencies participated. In addition to reviewing recent research results, objectives of the workshop included discussing research needs relative to the implementation of the final Recovery Plan and broadening involvement in western North Atlantic right whale research and management.

As noted above, the workshop report distributed by the Service in October 1992 included a brief summary and update of recent right whale research results. It also provided results of the deliberations of two working groups. The first working group, which considered human interactions with right whales, identified actions necessary to avoid adverse effects from ship traffic, fishing gear, and whale-watching activities. The second working group considered needs relative to habitat identification and protection. In this regard, the group placed highest priority on designing and implementing studies of genetic variability; determining the location of the winter grounds used by most of the right whale population; determining the location of a presently unknown but presumed nursing ground; reducing nutrient and contaminant levels in feeding habitats; and coordinating related U.S. and Canadian activities.

Proposed Critical Habitat Designation

On 12 July 1990 the National Marine Fisheries Service published a *Federal Register* notice announcing that it had received a petition from the Right Whale Recovery Team asking that three areas in the northwest Atlantic used regularly by northern right whales be designated as critical habitat under section 4 of the Endangered Species Act. The three areas included nearshore waters off Florida and Georgia used by females with newborn calves between January and March, parts of Cape Cod Bay and waters off Massachusetts used as a feeding area in March and April, and the parts of the Great South Channel used as a feeding area and migratory corridor by much of the western North Atlantic right whale population in May and June. The notice requested information on right whales in these areas and comments on the petitioned action. It also noted that the Service would conduct a review within 12 months to determine if the petitioned action was warranted.

The Commission wrote to the Service on 26 September 1990 noting that while there appeared to be sufficient grounds for designating the three areas as critical habitat, information in the petition on the occurrence of right whales in these areas was not sufficient to judge whether the proposed boundaries were appropriate, nor did it clearly identify special management considerations that should be evaluated. The Commission therefore advised the Service that it had contracted for a review of information concerning these points. The contract report entitled "Information on Right Whales (*Eubalaena glacialis*) in Three Proposed Critical Habitats in U.S. Waters of the Western North Atlantic Ocean" was completed in May 1991 (see Appendix B, Kraus and Kenney 1991) and forwarded to the Service on 31 May 1991.

In its letter to the Service accompanying the report, the Commission, in consultation with its Committee of Scientific Advisors, noted that analyses in the report confirm that all three areas are used seasonally by substantial numbers or right whales and/or by a vital component of the population (*e.g.*, females with calves). It also noted that each area appeared to meet established criteria for designating critical habitat. It therefore recommended that the Service immediately act to designate all three areas identified in the petition as critical habitat. In addition, the Commission recommended that the Service evaluate right whale sighting effort data for each area to determine if additional areas adjacent to the proposed boundaries also merit designation.

On 18 October 1991 the Service advised the Commission that an environmental assessment of the petitioned action was being prepared and that it expected to publish proposed rules in January 1992. By fall of 1992, the Service had yet to publish a determination regarding the petition's merit. Therefore, on 28 October 1992, the Commission wrote to the Service, noting that the lack of action was inconsistent with the spirit, if not the letter, of the Endangered Species Act's provisions for responding to petitions and that it was contrary to the Commission's recommendation of more than a year ago that immediate action be taken to proceed with the designation.

Noting that the Service is bound by the Marine Mammal Protection Act to provide a detailed explanation within 120 days as to why a Commission recommendation is not adopted, the Commission asked to be advised (1) precisely what the Service had done to review and respond to the petition; (2) why the Service had not adopted the Commission's recommendation to proceed immediately with the designation process; (3) whether the Service still planned to do so; (4) if the Service did not plan to propose critical habitat for right whales, the reasons why; (5) if the Service did plan to designate critical habitat, the steps and schedule to be followed in doing so; and (6) what steps the Service had taken to analyze effort data to determine if other areas adjacent to the petitioned areas also merit critical habitat designation.

By letter of 24 November 1992 the Service advised the Commission that other agency priorities had delayed its response to the petition and that it planned to proceed with a proposal to designate all three areas as critical habitat. In this regard, the Service stated it was completing an environmental assessment on designating the three areas and that it would publish proposed regulations in January 1993. The Service also noted that it had reviewed information on right whale sightings adjacent to the proposed areas and found that available data were insufficient to warrant designation of other areas.

For the future, the Service stated that it would respond to all Endangered Species Act petitions according to the following timetable: Proposed rules or a determination that a petitioned action is not warranted will be announced within one year of the date of receipt of a petition, and a decision on final rules will be published within one year of the publication date of any proposed rules.

Bowhead Whale
(*Balaena mysticetus*)

Bowhead whales occur only in the Arctic and sub-Arctic where they are circumpolar in distribution and seasonally associated with sea ice. Historically, there are believed to have been at least four separate bowhead whale populations. The largest surviving population is the western Arctic population, which migrates seasonally between the Bering Sea and the Chukchi and Beaufort Seas. The status of populations in other areas is not known.

Over-exploitation by commercial whalers between 1600 and 1900 reduced all populations to extremely low levels. Although every stock was subjected to intensive hunting at one time or another, both the period of exploitation and the extent of depletion appear to have differed. In the western Arctic, the population off Alaska, eastern Russia, and northwestern Canada was heavily exploited between 1848 and 1915. During that period, more than 19,000 whales were taken by commercial whalers. The Spitzbergen population, found north of Scandinavia, was believed to have been extirpated; however, recent sightings indicate that a remnant bowhead whale population still remains in the region.

Table 7. Quotas and number of bowhead whales taken by Alaska Eskimos, 1973-1992[1]

	IWC Quotas[2]		Number Taken			
Year	Landings	Strikes	Landed	Struck But Lost	Total Struck	Percent Struck Landed
1973	(No Quotas)		37	10	47	79
1974	(No Quotas)		20	31	51	39
1975	(No Quotas)		15	28	43	35
1976	(No Quotas)		48	43	91	53
1977	(No Quotas)		26	82	108	24
1978	14	20	12	6	18	67
1979	18	27	12	15	27	44
1980	18	26	16	18	34	47
1981	17	27	17	11	28	61
1982	17	27	8	11	19	42
1983	17	27	9	9	18	50
1984[3]	—	43	12	13	25	48
1985[3]	—	26	11	6	17	65
1986[3]	—	26	19	9	28	68
1987[3]	—	32	22	9	31	71
1988[3]	—	35	23	6	29	79
1989	41	44	18	8	26	69
1990	41	47	30	14	44	68
1991	41	44	27	19	46	59
1992	41	54	38	12	50	76

1 Cited quotas provided by the International Whaling Commission; data on the number of whales taken provided by the National Marine Fisheries Service.
2 In establishing quotas for both landings and strikes, the International Whaling Commission stipulated that whaling should cease whenever the number of whales landed or the number of strikes reached the specified number, whichever came first.
3 For the years 1984 through 1988, quotas were set for strikes only.

Bowhead whales were listed as endangered under the Endangered Species Act in 1970 and depleted under the Marine Mammal Protection Act in 1977. They are classified as a protected stock by the International Whaling Commission (IWC).

Eskimo Whaling

Bowhead whales are hunted by Alaska Natives for subsistence and cultural purposes. In the mid-1970s, the number of whales struck and landed or lost by Native whalers increased (see Table 7). This was due to several things, including improved wage-earning opportunities that enabled more hunters to outfit boats and crews.

As described in previous annual reports, in 1977 the International Whaling Commission's Scientific Committee reviewed information on the status of the western Arctic bowhead whale population and the

increased take by Alaska Natives. Concerned that the subsistence take was jeopardizing the population, the IWC, acting on the advice of its Scientific Committee, eliminated the exemption under International Whaling Convention's Schedule of Regulations that allowed Alaska Natives to take bowhead whales for subsistence purposes. That same year, the United States sought and secured reinstatement of the exemption, based largely on a pledge by the U.S. Commissioner to the IWC that the United States would undertake a comprehensive research program to closely monitor the status and trends of the western Arctic bowhead whale population.

In 1982 the IWC added a new paragraph, 13(a), to its Schedule of Regulations setting forth principles and guidelines for establishing catch limits for aboriginal/subsistence whaling. The new measure formally recognized the distinction between commercial and aboriginal/subsistence whaling. It also codified the IWC's past practice of attempting to strike a balance between the subsistence, cultural, and nutritional needs of aboriginal people and the need to protect affected whale stocks. Specifically, the new paragraph states that "[F]or stocks below the maximum sustainable yield (MSY) level but above a certain minimum level, aboriginal/subsistence catches shall be permitted so long as they are set at a level which allows the whale stock to move to the MSY level." Allowable catch levels established by the IWC are based on advice from its Scientific Committee and are recommended to member nations as actions to be implemented.

To implement the new measure, the U.S. Department of the Interior developed a quantitative procedure for determining the nutritional, subsistence, and cultural needs of the Alaska Eskimos. Based on data available in 1983, the subsistence and cultural need for bowhead whales was established at 26 animals landed per year. Considering new sources of data from research in nine Alaska Native whaling villages, this estimate was revised in 1988 to 41 whales landed per year.

The United States subsequently requested and received from the IWC an annual quota of 41 whales landed or a maximum of 47 animals struck for the years 1989, 1990, and 1991. In 1991, the United States requested a quota of 54 strikes per year for the years 1992, 1993, and 1994 with no more than 41 whales landed in any one year (Table 7). The IWC adopted these proposed catch limits, along with a provision to allow Natives to carry over a combined total of up to 13 unused strikes from the 1989, 1990, and 1991 seasons. In 1991, 46 bowhead whales were struck and 27 were landed; in 1992, 50 whales were struck and 38 were landed.

The Alaska Eskimo bowhead whale hunt is regulated by the Alaska Eskimo Whaling Commission pursuant to a 1981 Memorandum of Understanding between the Commission and the Department of Commerce. The memorandum has been reviewed annually and the number of whales struck, landed, and lost by Alaska Natives has been consistent with the quotas established by the IWC.

In August 1991 the Canadian Minister of Fisheries and Oceans issued a license to the western Arctic Inuvialuit community of Aklavik for the take of one bowhead whale. Canada, which is not a member of the IWC, did so without consulting the IWC. The Inuvialuit Natives subsequently struck two whales, one of which was landed. Absent consultations with the IWC, Canada's action could be viewed as "diminishing the effectiveness" of the IWC's conservation program and grounds for certification under two relevant U.S. laws — the Pelly Amendment to the Fishermen's Protective Act (22 U.S.C. § 1978) and Packwood-Magnuson Amendment to the Magnuson Fishery Conservation and Management Act (16 U.S.C. § 1821(e)(2)).

In response to U.S. concerns, the Canadian Ambassador wrote to the U.S. Secretary of Commerce on 30 September 1991, stating that a committee of officials from various Canadian Government departments would review the issues and problems arising from the Inuvialuit bowhead whale hunt, including the Canadian Government's position *vis-a-vis* the IWC. Because of the implications of the Canadian hunt for the conservation of bowhead whales, the Marine Mammal Commission wrote to the U.S. IWC Commissioner on 5 December 1991, recommending that, notwithstanding the need to investigate the circumstances surrounding issuance of the Canadian license, action be taken to certify the Government of Canada

under the Pelly Amendment for diminishing the effectiveness of the IWC's conservation program. No action was taken in 1991 or 1992 to certify Canada for authorizing the whaling activities. However, representatives of the Canadian Government were contacted to determine Canada's intent concerning future bowhead whale hunting and the possibility of rejoining the IWC. No bowhead whales were taken, or authorized to be taken, by the Inuvialuit in 1992, and no action was taken by the Canadian Government to join the IWC.

Industry/Native Agreement

Various activities associated with offshore oil and gas exploration and development may affect the movement and behavior of bowhead whales, which may in turn affect the Alaska Eskimo bowhead whale hunts. For example, hunters may have to travel greater distances to find whales, thereby increasing their risk of being injured or killed. To avoid such possibilities, the Alaska Eskimo Whaling Commission and certain oil companies engaged in activities on Alaska's North Slope entered into a cooperative agreement calling upon the industry to assist Native hunters, as needed, in a number of ways. These may include towing whales killed by Native hunters to a suitable butchering site to prevent meat from spoiling; caching emergency supplies, such as gasoline and food, at selected sites for use by Native subsistence hunters; providing emergency assistance to hunters during adverse weather conditions; assisting with the transport of whale meat to minimize spoilage; and specifying actions that industry planes and vessels will take to avoid interfering with ongoing whaling activity. The agreement was approved by the National Oceanic and Atmospheric Administration in 1986 and has been renewed annually since that time.

Current Population Status

In May 1991 the IWC's Scientific Committee conducted a comprehensive assessment of the western Arctic bowhead whale population. The Committee reviewed the results of recent and ongoing photogrammetry studies, ice-based censuses, subsistence catches, and other population studies. In combination, these research results provide new insight into the population biology of bowhead whales. They suggest that individual growth is slower and age of onset of female sexual maturity is later (13-17 years instead of 9 years) than previously thought; age at recruitment of whales into the exploitable population is between 1 to 7 years; the average calving interval is probably about 4 years; the proportion of immature individuals in the population is 0.44 to 0.65, which is indicative of a growing population; and the population increased at an average annual rate of 3.1 percent for the period 1978 to 1988.

The Committee estimated that in 1988 the western Arctic bowhead whale population numbered approximately 7,500 animals (95 percent confidence interval of 6,400 to 9,200 animals). The initial pre-exploitation (1848) population was estimated at 12,400 to 18,200 whales. The Committee also estimated that the annual replacement yield (*i.e.*, the number of animals that could be replaced by population growth if taken from the population) would be 254 individuals, with 92 whales being the lower bound of the estimate's 95 percent confidence interval. The Committee concluded that the expected Native subsistence kills of 41 to 54 whales per year, by themselves, should not prevent the recovery of the stock. However, other factors (*e.g.*, environmental change, pollution, noise disturbance from offshore oil and gas resource development, *etc.*), combined with the subsistence take, could have cumulative effects that would prevent the stock's recovery.

Attempts to undertake simultaneous ice edge visual and acoustic censuses and aerial surveys were unsuccessful in 1992 due to severe ice conditions, but it is planned that these studies will be conducted in 1993. With the 1993 data, the Scientific Committee hopes to make a new assessment of the stock in 1994.

Research Planning and Coordination

As noted in previous annual reports, the Marine Mammal Commission has played a significant role in planning and coordinating U.S. bowhead whale research. Between 1978 and 1981, the Commission recommended and helped organize research review and coordination meetings. The meetings were designed to identify and avoid possible duplication of research and to coordinate work being planned or

supported by the Alaska Eskimo Whaling Commission, the Minerals Management Service, the National Marine Fisheries Service, the North Slope Borough, the oil and gas industry, and the State of Alaska. By letter of 11 January 1982, the Marine Mammal Commission recommended that the National Marine Fisheries Service's Alaska Regional Director assume responsibility for convening regular coordination meetings of all researchers and sponsors before the start of each spring bowhead whale research season.

In subsequent years, formal coordination meetings were not always held, and it was not clear that everything necessary was being done to ensure that bowhead whale studies continued to be well-designed and properly coordinated. In its 20 March 1989 comments on a permit application related to a Minerals Management Service contract study, the Commission recommended that the National Marine Fisheries Service issue the permit with the condition that the funding agency (the Minerals Management Service) constitute a quality review board to evaluate the proposed study design and recommend needed modifications. A Scientific Review Board was subsequently constituted and met twice each year to review the results of the preceding season's research and plans for the forthcoming season. The board did not meet in 1992 because poor weather conditions prevented ice-based field research.

In January 1992 the National Marine Fisheries Service convened a meeting in Barrow, Alaska, to coordinate research projects and identify duplicative efforts, to inform local residents of research plans, and to coordinate research activities with the Native subsistence hunt.

The National Marine Fisheries Service has lead responsibility in the United States for identifying, encouraging, and coordinating research necessary to ensure that human activities do not adversely affect bowhead whales or their habitat. Development of a recovery plan specifying research and management requirements would help the Service meet its responsibilities. Therefore, in its 5 December 1991 letter to the U.S. IWC Commissioner (see Chapter V), the Marine Mammal Commission recommended that the National Marine Fisheries Service develop a recovery plan for the western Arctic bowhead whale population. As of the end of 1992, the Commission was aware of no action by the Service to develop the recommended recovery plan.

Small-Take Exemption

On 18 July 1990 the National Marine Fisheries Service published in the *Federal Register* a final rule authorizing the incidental, non-lethal take of six species of marine mammals, including bowhead whales, incidental to oil and gas exploration activities in the Beaufort and Chukchi Seas from 1990 to 1995. The Commission's comments on this rule and subsequent requests by industry groups for letters of authorization to take bowhead whales are described in Chapter IX and in the previous annual report.

On a related issue, on 3 December 1992 the Secretary of the IWC sent member nations a communique from the Russian Federation indicating that the Russian Federal Fisheries Committee had granted a permit to Russian natives to take three bowhead whales in the Chukotskiy Peninsula region in November-December 1992. The communique indicated that this had been done because it had not been possible to take gray whales to meet the needs of aboriginal people in the region. Although requested, no additional information was available at the end of 1992.

In 1993 the Marine Mammal Commission will continue to monitor matters related to bowhead whales and advise the National Marine Fisheries Service, the Minerals Management Service, and other agencies on further actions to protect and encourage the recovery of the western Arctic bowhead whale population.

Humpback Whale
(*Megaptera novaeangliae*)

Humpback whales occur throughout the world in both coastal and open ocean areas. They typically migrate between tropical and sub-tropical latitudes and temperate to polar latitudes. The former areas are occupied during winter months when the whales engage in mating and the females bear their young. Little if any feeding occurs on the wintering grounds. Polar areas are occupied in the spring, summer, and

fall months when feeding occurs. Principal prey species include small schooling fish, such as sand lance, capelin, mackerel, and anchovy, as well as krill. Some 13 stocks of humpback whales have been identified worldwide, three of which are found seasonally in U.S. waters. These are the western North Atlantic, eastern North Pacific, and central North Pacific stocks.

All stocks of humpback whales were severely reduced by commercial whaling. Because of this decline, the International Whaling Commission banned exploitation of the species in 1966. Humpback whales were listed as endangered under the U.S. Endangered Species Preservation Act in 1970, a designation carried forward under the Endangered Species Act of 1973. Humpback whales also are listed on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora. By virtue of this listing, international trade in any humpback whale product for commercial purposes is banned.

Under this protection, many stocks have begun to recover. However, recovery rates may be slowed and the extent of recovery limited by noise disturbance, collisions with vessels, entanglement in fishing gear, whale-watching activities, oil spills, offshore oil and gas development, offshore sand and gravel mining, dredge spoil disposal, discharge from sewage outfalls, coastal development, and depletion of prey resources.

The Humpback Whale Recovery Plan

In 1984 and again in 1986, the Marine Mammal Commission recommended that the National Marine Fisheries Service prepare recovery plans for humpback whales and certain other endangered whales found in U.S. waters. In response, the Service constituted a Humpback Whale Recovery Team to assist in plan preparation. A draft plan was completed and circulated for review in October 1989.

The Commission, in consultation with its Committee of Scientific Advisors, commented on the plan by letter of 30 November 1989. Among other points, the Commission noted that the plan did not identify research and management tasks or the regional differences between the various stocks found in U.S. waters in sufficient detail to compare task priorities. It therefore recommended that the Service develop detailed implementation plans for each stock to provide a better basis for allocating funds and staff and for enlisting the support of other involved agencies and organizations.

The Service adopted a final Recovery Plan in November 1991 but has not yet advised the Commission as to steps that have been or will be taken to develop regional implementation plans. The Service's Humpback Whale Recovery Team has not met since the plan was adopted by the Service.

Central North Pacific Humpback Whales

Waters around the Hawaiian Islands provide the principal calving, nursing, and wintering grounds for the central North Pacific stock of humpback whales. Whales are found in Hawaii as early as November and as late as June; however, the period of peak abundance is from December to March. Based on photo-identification comparisons of tail flukes, it appears that most animals that winter in Hawaii are found in summer in coastal feeding grounds off Alaska and Canada, particularly between the eastern Aleutian Islands and British Columbia.

Although most animals appear to return annually to Hawaii, a few animals winter in Hawaii waters some years and in Mexican waters in others. The waters off Mexico's west coast, including the Revillagigedo Islands, are the major wintering grounds for the eastern North Pacific stock whose principal summer feeding grounds are along the coast of North America between Canada and California.

As described in previous annual reports, the Marine Mammal Commission has supported a number of studies to improve understanding of the number and habitat-use patterns of humpback whales in Hawaii (see, for example, Appendix B, Herman 1980, Glockner-Ferrari and Ferrari 1985, and Forestell 1989). It also has supported studies to examine possible management actions (see, for example, Appendix B, Norris and Reeves 1978 and Tinney 1988).

Research Coordination and Permitting — In 1990 the Marine Mammal Commission contracted for

a study to evaluate possible actions to avoid and mitigate threats to whales and their habitats in Hawaii waters (see Appendix B, Townsend 1991). Among other points, the report noted that an increasing number of research groups was conducting similar types of studies, some of which could be duplicative and result in unnecessary disturbance of the whales. With regard to this point, the report recommended that annual research coordination meetings be convened by the National Marine Fisheries Service.

The Commission provided the report to the National Marine Fisheries Service on 16 September 1991. In its transmittal letter, the Commission recommended that, when the Humpback Whale Recovery Plan was completed, the Service develop area-specific implementation plans, and that the plan for Hawaii include measures to address issues related to the effect of humpback whale research and its contribution to species recovery needs. The Service shared the Commission's concerns, and subsequently the Service and the Commission jointly planned and supported a research coordination workshop.

The meeting was organized by the Pacific area office of the National Marine Fisheries Service and hosted by the University of Hawaii Sea Grant College Program and Hale Kohola/Whaler's Village. It was held in Wailuku, Maui, Hawaii, on 23-24 January 1992. Objectives of the meeting included identifying future research plans so as to ensure that both researchers and the Service were fully aware of what was being planned; identifying possible harmful research practices and ways to avoid harmful effects; ensuring that planned studies address critical research needs consistent with the provisions of the Humpback Whale Recovery Plan; identifying and avoiding unnecessarily duplicative studies; and reviewing the research permit process and permit provisions. Participants included members of all of the research groups with active research permits to study humpback whales in Hawaii and representatives of the Service's permit and enforcement branches.

Although the Service has held annual meetings with research permit holders to review study plans and permit conditions for the past seven or eight years, these meetings have been limited to individuals or small groups. The January 1992 workshop was the first time that all groups actively conducting research in Hawaii were able to meet together in such a structured setting. Both the researchers and the managers responsible for overseeing research permits found the workshop to be an effective and valuable opportunity to discuss issues of mutual concern, to share information on recent findings and study plans, and to constructively assess ways to better coordinate and carry out research activities.

During the meeting the Service reviewed the permit process and clarified current permit requirements, including stipulations for limiting permits to *bona fide* research that is not unnecessarily duplicative, recording and reporting data on approaches to whales, flying flags to indicate vessels engaged in authorized research, and notifying the Service as to the dates and locations of research activities. Researchers reviewed recent study findings and research plans and discussed ways to improve cooperation and data sharing.

There was agreement that similar workshops should be held annually. Also, it was recommended that the next workshop should be a two- or three-day field workshop during which participants would spend time on boats comparing and sharing field techniques used to approach and study whales. By doing so, it is hoped that a common understanding could be developed on how to approach and maneuver research vessels in the presence of whales in the least disruptive manner. It would also allow researchers and managers to share the best aspects of their various research techniques, help standardize procedures used by different researchers to collect photographs and other types of data, and provide researchers with greater confidence in the data recorded by others.

As of the end of 1992, a meeting site and other support for such a workshop had been donated, but it was not clear whether the Service would be able to provide the funding necessary for the remaining logistics costs.

Hawaiian Islands Humpback Whale National Marine Sanctuary — Because of the importance of waters off Hawaii for humpback whales, consideration has been given to designating a national marine sanctuary in the Islands for humpback whales under

the provisions of Title III of the Marine Protection, Research, and Sanctuaries Act. This Act authorizes the Secretary of Commerce to designate and manage marine sanctuaries to protect marine areas of national significance. Administration of this responsibility rests with the Sanctuaries and Reserves Division of the National Ocean Service, an agency of the National Oceanic and Atmospheric Administration. While various areas off Hawaii were considered during the 1970s and 1980s, no sites were designated.

In 1990 Congress directed the National Oceanic and Atmospheric Administration to conduct a study to assess the feasibility of establishing a national marine sanctuary in waters adjacent to the island of Kahoolawe and to determine the effect such a sanctuary would have on humpback whales. The Division subsequently consulted with Federal and State agencies, solicited comments from the public, and prepared a summary report, which it released in December 1991. The report noted that biological, cultural, and historical resources adjacent to Kahoolawe merited further investigation; additional marine areas in Hawaii merited further consideration for sanctuary status; and the National Marine Sanctuary Program could enhance marine resource protection in Hawaii.

In 1992 Congress considered legislation to amend the National Marine Sanctuary Program's authorizing legislation. As a result of its deliberations, it passed the "National Marine Sanctuaries Program Amendments Act of 1992," which was signed into law by the President on 4 November 1992. During its review, Congress examined the need for a marine sanctuary to protect humpback whales and their habitat in Hawaii. Based on its examination of the issue, including the findings set forth in the Division's report, Congress included a provision in its amendments to designate the "Hawaiian Islands Humpback Whale National Marine Sanctuary."

The sanctuary boundaries designated by Congress include all waters within the 100-fathom (183-meter) isobath around the islands of Lanai, Maui, and Molokai, including Penguin Bank. Also included are the deeper waters between Molokai and Maui and the waters shallower than 100 fathoms off the Kilauea Point National Wildlife Refuge on the island of Kauai. Areas within three miles of Kahoolawe are excluded from the sanctuary at this time but will be added in January 1996 unless the Secretary of Commerce finds the area unsuitable for inclusion following an assessment of site resources and uses.

The boundaries identified by Congress are subject to modification pending review and action by the Governor of Hawaii and the Secretary of Commerce. For example, if the Governor advises the Secretary within 45 days of the enactment date that he finds the designation of State waters unacceptable, State waters will be excluded from the sanctuary boundaries. As of the end of 1992, the 45-day period had nearly elapsed, and the Governor had not advised the Secretary of any finding of unacceptability. Also, when the Secretary issues the required draft environmental impact statement for the sanctuary, the proposed management and regulatory scheme, including the boundaries, may be modified in consultation with the Governor.

The purposes of the new sanctuary, as set forth in the Act, include protecting humpback whales and their habitat in the designated area; providing education and interpretation for the public on the relationship of humpback whales to the Hawaiian Islands' marine environment; managing human activities consistent with the provisions of the Marine Protection, Research, and Sanctuaries Act; and identifying marine resources and ecosystems of national significance for possible inclusion within the sanctuary.

To meet these purposes, the Act directs the Secretary to prepare, within 18 months of the enactment date, an environmental impact statement, a comprehensive management plan, and regulations for the new sanctuary. Among other points, the plan must address actions to facilitate public and private uses consistent with the primary objective of protecting humpback whales and their habitat, enforce sanctuary rules, and establish a long-term ecological monitoring program with respect to the whales and their habitat.

As of the end of 1992, it was the Commission's understanding that the Sanctuaries and Reserves Division would be meeting with State officials early in 1993 and would hold public scoping meetings by spring to help determine how best to proceed with regard to implementing the new sanctuary.

Glacier Bay National Park — A portion of the central North Pacific stock of humpback whales feeds in Glacier Bay in Southeast Alaska. The bay lies within Glacier Bay National Park administered by the National Park Service. As noted in previous annual reports, late in the 1970s the number of whales in the bay declined and it was believed that increased tour boat and other vessel traffic may have caused or contributed to the decline. In response, the Park Service, in consultation with the National Marine Fisheries Service, established a system for regulating vessel entries and vessel traffic patterns in the Bay.

In 1990 the Park Service authorized two cruise ship entries in excess of the entry ceiling established under its regulations. In response, the Alaska Wildlife Alliance filed a suite challenging the Service's action. The status of this litigation is discussed in Chapter VIII.

North Atlantic Humpback Whales

In the western North Atlantic Ocean, most humpback whales winter in waters off the Greater Antilles and Leeward Islands on the northeast edge of the Caribbean Sea. Among the locations with the greatest concentrations of whales during winter are Silver and Navidad Banks north of the Dominican Republic, Samana Bay on the north coast of the Dominican Republic, and Mona Passage between the Dominican Republic and Puerto Rico. In the eastern North Atlantic Ocean, some whales winter off northwest Africa and the Cape Verde Islands.

By summer, most whales have migrated to northern feeding grounds. The principal known feeding areas are the Gulf of Maine (including Stellwagen Bank off Massachusetts), the Gulf of St. Lawrence, along the Atlantic coasts of Newfoundland and Labrador, off southwest Greenland, around Iceland, and off Norway. The Marine Mammal Commission has supported several studies to improve information on humpback whales in the western North Atlantic Ocean (see, for example, Appendix B, Mayo 1982, Whitehead *et al.* 1982, and Katona 1983).

Project YONAH — To improve understanding of humpback whales in the North Atlantic, scientists from seven countries have developed a three-year cooperative research project called project YONAH (Years of the North Atlantic Humpback Whale). The objectives of this research project are to assess the species' distribution, abundance, behavior, movement between feeding areas, and stock discreteness in the North Atlantic basin. To examine these points, the project includes a series of intensive sub-projects to photograph and collect tissue samples from individual whales at each of the major summer feeding grounds and the principal winter habitat in the West Indies.

The first two years of the project emphasize field research and the final year is devoted principally to data analysis and manuscript preparation. Participants include scientists from Canada, Denmark, the Dominican Republic, the United Kingdom, Iceland, Norway, and the United States. As noted in its previous annual report, the Commission provided partial support for the first year of field work in 1992.

The first year of work exceeded expectations. A total of more than 2,000 good-quality fluke photographs and 1,100 biopsy samples were collected from all major winter and summer habitats. These included more than 1,000 photographs and 750 biopsy samples from the West Indies, 50 photographs and 20 biopsies from waters off Norway, and 100 photographs and 50 biopsies from Iceland. Also during 1992, information was gathered suggesting a possible new summer feeding ground off Baffin Island in northeast Canada. In 1993, project scientists plan to repeat the 1992 field program and to survey waters off Baffin Island.

Stellwagen Bank National Marine Sanctuary — Stellwagen Bank, a submerged sand bank roughly 20 nautical miles in length north of Cape Cod, Massachusetts, is a feeding area used regularly by a significant portion of the western North Atlantic humpback whale population. It is also important habitat for many other marine species and for several years has been considered for possible designation as a national marine sanctuary.

On 8 February 1991, the Sanctuaries and Reserves Division published a *Federal Register* notice proposing rules to designate the bank as a marine sanctuary under Title III of the Marine Protection, Research, and Sanctuaries Act and announcing the availability of a draft management plan and environmental impact

statement on the proposed action. The plan sets forth a comprehensive long-term system of management measures, including regulations to protect marine resources and habitat located on and around Stellwagen Bank. The Commission provided comments to the Division on 9 April 1991 recommending that efforts proceed to designate the area and implement an associated sanctuary management program.

As noted above, Congress passed amendments to the sanctuary program's authorizing legislation, which were signed into law by the President on 4 November 1992. Among other points, the amendments include provisions to designate Stellwagen Bank and adjacent waters as a national marine sanctuary. The designated sanctuary area, approximately 35 nautical miles long and 25 nautical miles wide, includes the waters and submerged lands on the eastern side of Massachusetts Bay from Cape Cod to Cape Ann but excludes waters within three miles of shore. The Act also includes a provision to prohibit sand and gravel mining within the sanctuary but left other management provisions to be developed by Sanctuaries and Reserves Division.

As of the end of 1992, the Division was in the process of completing revisions to its final environmental impact statement and management plan for the sanctuary in response to the Congressional action. Final rules to implement the sanctuary designation are expected to be published in March 1993 and to become effective in June. To administer the new sanctuary, the Division expects, among other things, to constitute an advisory committee and establish the sanctuary headquarters in Plymouth, Massachusetts.

Gray Whale (*Eschrichtius robustus*)

The gray whale is the sole member of the family Eschrichtiidae. It occurs only in the North Pacific Ocean and breeds, feeds, and migrates primarily in coastal waters. There are two recognized populations of gray whales — the western North Pacific (Korean) stock and the eastern North Pacific (California) stock. Each year, virtually the entire eastern North Pacific population migrates to and from its major summer feeding grounds in the Bering and Chukchi Seas and winter breeding grounds in the nearshore waters, bays, and lagoons of Baja California, Mexico, and to some extent the Gulf of California.

Following discovery of the breeding lagoons, the population was severely depleted by commercial whaling in the mid-1800s. A second period of commercial whaling using factory ships further depleted the stock in the early 1900s. By 1946, when the International Convention for the Regulation of Whaling provided the eastern North Pacific gray whale population protection from commercial whaling, it was believed to number no more than a few thousand individuals. In 1970 additional protection was provided when the species was listed as endangered under the 1969 Endangered Species Conservation Act predecessor to the Endangered Species Act of 1973.

Since commercial whaling was prohibited, the eastern North Pacific population has grown at the most rapid known rate of any whale stock seriously depleted by commercial whaling. The population is now estimated to number nearly 24,000 whales and appears to be continuing to increase. In response to its continuing recovery, in 1978 the International Whaling Commission reclassified the eastern North Pacific gray whale stock from a protected to a sustained management stock. At its 1991 meeting the IWC approved an annual quota of 169 whales for 1992, 1993, and 1994, to be taken from this population by Russia on behalf of its Siberian Natives.

Although the population now appears to be near pre-exploitation levels, its nearshore distribution and migratory routes expose it to many threats from habitat degradation and direct physical harm from human activities. Commercial fishing, offshore oil and gas activities, commercial shipping, whale-watching, recreational boating, and military activity pose threats to individual whales, and to feeding, breeding, and migratory areas essential to their survival.

Comprehensive Assessment by the International Whaling Commission's Scientific Committee

As noted in previous annual reports, the International Whaling Commission's Scientific Committee

conducted a comprehensive assessment of the status of the two gray whale populations at a special meeting on 23-27 April 1990. The meeting participants concluded that the western North Pacific population remains severely depleted. They recommended that research be undertaken cooperatively by the Soviet Union, Japan, the Republic of Korea, the People's Democratic Republic of Korea, and the People's Republic of China to better determine the distribution, abundance, and possible increase of the western North Pacific population.

The participants concluded that the best estimate of the eastern North Pacific population was a 1987/1988 estimate of 21,113 (standard error = 688) whales. They also concluded that, between 1968 and 1988, the population had increased at an average annual rate of 3.2 percent, despite an average annual Soviet subsistence catch of about 174 whales per year during this period.

In 1992 the International Whaling Commission's Scientific Committee reexamined factors that had been used to correct census data. It derived a revised estimate of 23,859 individuals (with a 95 percent confidence interval of 21,500 - 26,500) for the eastern Pacific population.

Endangered Species Status Review

Section 4(c)(2) of the Endangered Species Act requires that a status review of listed species be conducted at least once every five years to determine whether any species should be removed from the list or reclassified. The National Marine Fisheries Service conducted status reviews of endangered whales, including gray whales, in 1984 and 1990. The Service's 1984 review concluded that increasing industrial development and vessel traffic in the calving lagoons and in other vital habitats along migration routes and on feeding grounds may be a potential threat to the population. After taking into account the continuing growth of the population, the Service concluded that, although the population was no longer endangered, threats to feeding and breeding areas and migratory corridors warranted its reclassification from endangered to threatened. The Service also concluded that the western North Pacific stock had not recovered and should remain listed as endangered. The Service, however, took no action to effect a change in the species listing status following its 1984 review.

In its 1990 status review, the National Marine Fisheries Service concluded that the California stock had recovered to near its original population size and was neither in danger of extinction throughout all or a significant portion of its range, nor likely to again become endangered within the foreseeable future.

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

In light of the National Marine Fisheries Service's 1990 status review, the Northwest Indian Fisheries Commission petitioned the Service on 1 March 1991 to remove the eastern North Pacific population of gray whales from the List of Endangered and Threatened Wildlife. The petitioner argued that the population's recovery to 21,113 animals and its continuing increase merited removing the population from the list and claimed that leaving the population on the list subjected users of living marine resources to unwarranted restrictions and penalties and jeopardized the credibility of the Endangered Species Act.

On 15 July 1991, the Service sent the Marine Mammal Commission a draft *Federal Register* notice proposing to remove the eastern North Pacific gray whale population from the List of Endangered and Threatened Wildlife, while retaining the western North Pacific population on the list as endangered. The draft notice indicated that the eastern population was equal to or greater than its estimated historical size, and the population has been increasing at a rate of 3.2 percent per year since the early 1960s.

By letter of 21 August 1991, the Commission advised the National Marine Fisheries Service that it agreed that the eastern North Pacific gray whale population had recovered to near its estimated historic size. The Commission noted, however, that the population occupies coastal waters of four nations — Russia, Canada, the United States, and Mexico — and ongoing and foreseeable human development in all four countries must be considered to accurately assess possible threats to the population and habitats critical to its survival. The Commission recommended that

the Service expand the *Federal Register* notice to (1) assess present and foreseeable threats to areas of special biological importance to the species; (2) review all biological opinions issued pursuant to section 7 of the Endangered Species Act to determine how delisting or downlisting gray whales might affect implementation of reasonable alternatives or other conservation measures; and (3) describe specific actions the Service would take to ensure that human activities do not damage or degrade habitat essential to the population's survival.

On 22 November 1991 the National Marine Fisheries Service published a proposed rule in the *Federal Register* to remove the eastern North Pacific population of gray whales from the List of Endangered and Threatened Wildlife. As required by the Endangered Species Act, the Service assessed five factors in determining whether the population should remain listed as endangered, be downlisted to threatened, or be removed from the list completely. Those factors are (1) the present or threatened destruction, modification, or curtailment of the species' or range; (2) overutilization for commercial, scientific, or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; and (5) other factors affecting the species' continued existence.

In its assessment, the Service determined that the eastern North Pacific gray whale population has recovered to near or above its estimated pre-exploitation population size and is probably continuing to increase; a number of studies since 1984 suggest that impacts from oil and gas activities are not likely to jeopardize the continued existence of the population; and the population was neither in danger of extinction nor likely to become endangered again within the foreseeable future.

In a letter dated 15 May 1992 the Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, commented on the Service's proposed rule. The Commission concurred that significant progress toward recovery had been made, but questioned whether delisting was justified. As a threshold matter, the Commission noted that there was no conclusive evidence that the eastern and western North Pacific gray whale stocks are discrete, reproductively isolated populations and thus should be treated as separate entities for listing purposes. The Commission also noted that, while the eastern Pacific stock may be at or near pre-exploitation levels, it continues to face threats, particularly to critical feeding areas, breeding areas, and migratory corridors. In this context, the Commission pointed out that, with little analysis or supporting documentation, the Service had concluded that the major gray whale calving lagoons in Baja California, Mexico and the feeding grounds off Alaska were sufficiently protected by Mexican and U.S. law.

The Commission also noted that the Service, in 1983 and 1984, had issued jeopardy biological opinions for five proposed oil and gas lease sales in the Bering and Chukchi Seas, but that the proposed rule did not provide information or analyses to support the conclusion that the situation had changed. In addition, the Commission noted that habitat degradation was the principal current threat to the population and that essential habitats, as well as population numbers, should be monitored following delisting to verify that the action was appropriate. In this regard, the Commission noted that the Service, in its 25 November 1991 reply to its comments on the draft proposed rule discussed earlier, had advised the Commission that "because of limited funding and critical needs elsewhere, monitoring will likely be limited to biennial surveys to monitor trends in abundance."

The Commission recommended that, rather than delist the eastern North Pacific gray whale population, the Service downlist it to threatened status unless it could provide more compelling support for the conclusions that (1) the western and eastern North Pacific populations are independent; (2) habitat degradation and destruction do not present a significant threat to survival of the population; (3) the jeopardy biological opinions issued for gray whales are no longer valid; (4) programs necessary to effectively assess and monitor habitat as well as population status and trends throughout the range of the species have been identified and will be implemented; and (5) arrangements have been made with other nations sufficient to be confident that gray whales and essential gray whale habitat will be protected if delisting occurs.

In a letter dated 30 December 1992, the Service responded to the Commission's recommendations and

advised the Commission that it was recommending that the Department of the Interior remove the eastern North Pacific gray whale population from the List of Endangered and Threatened Wildlife. The Service also provided a "notice of determination" that it had sent to the *Federal Register* for publication.

The *Federal Register* notice provided a comprehensive assessment of present and foreseeable threats to the species and its habitats, including a re-analysis of past biological opinions concerning proposed oil and gas lease sales in the Bering and Chukchi Seas. The assessments supported the Service's finding that, while certain human activities pose threats to individuals and habitats of special importance, the eastern Pacific gray whale population is neither in danger of extinction throughout all or a significant portion of its range, nor likely to again become endangered within the foreseeable future in any portion of its range. In this context, the assessment concluded that existing national and international regulatory mechanisms are adequate to protect essential habitats, as well as the population.

With respect to follow-up, the Service indicated that it planned to continue biennial shore counts to monitor population size and that it believed this would provide adequate warning of any future population decline. The Service also indicated that, to the extent possible, it would establish a long-term cooperative research program with Mexico to monitor trends and abundances in the Baja California breeding lagoons. In addition, the Service indicated that it would continue to work with and coordinate research through the International Whaling Commission to ensure adequate protection for gray whales. With respect to habitat assessment and monitoring, the Service noted that limited funding was available and that in its view there were other research programs that should be afforded higher priority for funding.

At the end of 1992 the planned 1992-1993 biennial census of the gray whale winter migration had begun.

America's Cup Races

As a related matter, the issue of adverse effects of human activities on gray whales arose during the International America's Cup Regatta, held off San Diego from January to May 1992. At the outset of the races, there were reports of spectator boats harassing migrating gray whales. On 16 January 1992 the Commission contacted the local Coast Guard District Commander to explain the implications of whale harassment in light of the Marine Mammal Protection Act, and to suggest that the Coast Guard periodically broadcast an advisory to all boaters on the VHF radio. In response, the Coast Guard immediately broadcast advisories on appropriate radio frequencies and continued them throughout the races.

On 17 January 1992 the Commission wrote to the National Marine Fisheries Service suggesting that the Service prepare and provide boaters associated with the race a brief fact sheet describing the basic life history of gray whales; relevant whale watching guidelines; applicable provisions of the Marine Mammal Protection Act and the Endangered Species Act; and the civil and criminal penalties under those statutes. The Service subsequently prepared and distributed a fact sheet.

On 23 January 1992, the District Commander wrote to thank the Commission for its assistance and guidance and to indicate that National Marine Fisheries Service and Coast Guard personnel were checking into each report of harassment.

Killer Whale
(*Orcinus orca*)

Killer whales occur in all oceans of the world from polar to equatorial latitudes and in both coastal and pelagic regions. In the United States, killer whales are most common in Puget Sound, Washington, and the coastal waters of Alaska. Killer whales are highly social and form long-term associations along maternal lines. The basic social unit is the "pod."

In the past, killer whales have been hunted commercially; however, exploitation was never large-scale. The most recent commercial take of killer whales was by the former Soviet Union in the Antarctic in 1979-1980.

Killer whales have been captured for public display in oceanaria and zoos since the early 1960s. They

were taken for this purpose from coastal waters of British Columbia and Puget Sound from 1962 to 1976. Although a permit to take killer whales in Alaska waters for public display was issued by the National Marine Fisheries Service in 1983, in 1985 the courts held the permit to be invalid because the Service had not met the requirements of the National Environmental Policy Act before issuing it. As a result, no animals were captured. Since the mid-1970s, most animals taken for public display have been from waters off Iceland.

No population of killer whales is listed as either endangered or threatened. However, its occurrence in small, highly social groups and their relatively low density make local groups vulnerable to adverse impacts. As described below, there may be a need for additional protective measures to prevent deliberate and accidental killing of killer whales in parts of Alaska.

Interaction with Fisheries

Killer whales are top-level predators whose prey includes large whales, dolphins, seals, and commercially valuable fish species. In some areas, killer whales are attracted to commercial fishing operations where they take hooked fish from lines and damage fishing gear. As a result, some fishermen consider killer whales to be competitors and nuisance animals.

Killer whales interact with commercial blackcod (sablefish) longline fisheries in the Bering Sea, Prince William Sound, and waters off southeast Alaska. In the 1960s Japanese longline fishermen fishing for blackcod off the Aleutian Islands reported killer whales removing or damaging hooked fish as lines were retrieved. Dockside interviews conducted in 1988 with U.S. Bering Sea longline fishermen suggested that depredation by killer whales occurred in 20 percent of the sets. Beginning in 1985 blackcod longline fishermen in Prince William Sound reported similar interactions. Field surveys in Prince William Sound in 1986 suggested that some fishermen lost 25 percent of their catch to killer whales.

A variety of techniques has been tried to reduce or eliminate such interactions. Without success, fishermen have tried acoustic deterrents, such as "bang pipes" and seal bombs, and working their vessels in teams, alternately retrieving lines. Fishermen also have tried shooting whales and using large explosive charges to keep whales from removing hooked fish as longlines are retrieved. Until the mid-1980s, fishermen could obtain incidental take permits from the National Marine Fisheries Service that allowed them to intentionally take marine mammals to protect their gear, their catch, or themselves. Studies of killer whale pods in Prince William Sound between 1985 and 1986 documented gunshot wounds and a much higher than normal annual mortality rate in one pod known to interact with fishing operations. Recognizing this as a problem, the National Marine Fisheries Service amended incidental take permits in July 1986 to prohibit the use of explosives and shooting as a means of preventing killer whales and other cetaceans from affecting fishing gear or catch.

As noted in Chapter IV, the incidental take permits were replaced by enactment of a five-year interim exemption for commercial fisheries in 1988. Under the interim exemption, the intentional lethal taking of any cetaceans, including killer whales, incidental to commercial fishing operations is prohibited.

Interactions between killer whales and longline fisheries in Prince William Sound and throughout the Aleutian Islands have continued, and recent reports indicate that whales sometimes take halibut and Pacific cod as well as blackcod. No effective, non-harmful means has been found to prevent depredation of caught fish. Although it is illegal, fishermen reportedly continue to shoot whales and use explosives to try to stop whales from removing hooked fish.

Effects of the *Exxon Valdez* Oil Spill

The 24 March 1989 grounding of the *Exxon Valdez* in Alaska's Prince William Sound caused the largest oil spill in U.S. history (see the Commission's previous annual report for a detailed discussion). Killer whales and other marine mammals occur in the area and may have been affected both directly and indirectly. One killer whale pod known to inhabit Prince William Sound numbered 36 whales when last seen in September 1988 prior to the oil spill. When the pod was sighted on 31 March 1989, seven days after the spill, seven individuals were missing. Six additional

individually recognizable whales were missing from the pod in 1990. If the missing whales are dead, the mortality rates for the pod were 19.4 percent in 1988-1989 and 20.7 percent in 1990-1991. The average annual mortality rate in the same pod from 1984 to 1988 was 6.1 percent. Several of the missing whales were females that left behind offspring subsequently seen with the pod. There are no previous records of female killer whales abandoning their offspring. Evidence suggests that loss of the females altered the social structure of the pod, and significant mixing of maternal groups has occurred. An additional whale was missing in 1991, but a calf was also born into the pod. In 1992 no whales were missing from the pod and two births occurred.

On 25 September 1991 the Federal Government and the State of Alaska agreed to a settlement for injuries resulting from the rupture of the *Exxon Valdez*. A Trustee Council, comprised of the Federal Trustees' designees and the State Trustees, was established; the Council is responsible for decisions relating to the assessment of injuries, uses of the funds received for restoration, and all restoration activities. Studies of Prince William Sound killer whales have been part of the damage assessment and restoration program, and the research is expected to continue in 1993.

Commission Review of Population Assessment Proposals

On 23 October 1992 the National Marine Fisheries Service asked the Commission to review a number of proposals submitted by its regional fisheries science centers. The proposals were for continued support of studies being done to assess the status of marine mammal populations possibly being affected adversely by interaction with various fisheries in U.S. waters. The studies are intended to obtain information necessary to implement the Service's proposed regime to govern interactions between marine mammals and commercial fishing operations (see Chapter IV).

One of the proposals was for continuing a three-year survey to obtain a minimum estimate of killer whale abundance in Alaska coastal waters. The proposal noted reports of fishermen using high-powered explosives to frighten killer whales away from their boats during fishing operations and recent evidence of bullet wounds in killer whales (some individuals in 42 percent of the pods studied reportedly exhibited bullet wounds). It indicated that without a minimum population estimate, fisheries in Alaska would be in jeopardy of being closed due to the potential for interactions with killer whales.

The Commission transmitted its comments to the Service on 3 December 1992, noting that killer whales are being taken intentionally, not incidentally, in certain Alaska fisheries. Such intentional taking is prohibited under the present interim exemption and would be prohibited by the Service's recommended regime to govern marine mammal-fisheries interactions after 30 September 1993. Consequently, the Commission pointed out that the problem described in the proposal appears to be an enforcement problem that cannot be resolved by obtaining a minimum population estimate. The Commission also noted that, if a minimum population estimate is needed, it is not clear that it could be obtained most economically by the proposed study design for planned boat surveys.

Much of the available data concerning the distribution and abundance of killer whales in Alaska waters have come from the comprehensive surveys and photo-identification studies that were done in Prince William Sound and adjacent areas as part of the *Exxon Valdez* oil spill damage assessment program noted earlier. Also, several independent groups of investigators have been conducting killer whale studies in different parts of Alaska and are providing the National Marine Mammal Laboratory copies of identification photographs of individual killer whales taken during those studies. The Commission noted that the National Marine Mammal Laboratory's proposal did not reference or describe these studies, nor indicate why the Laboratory could not provide any distribution or abundance estimates based on data already collected. The Commission recommended that, if funding is available for studies of killer whales in Alaska, priority be afforded to evaluating possible means for preventing or reducing killer whale predation of fish being caught in longline fisheries and that consideration be given to expanding the ongoing photo-identification studies being conducted by other independent researchers.

Alaska Killer Whale Species Account

As noted above, there are many uncertainties concerning the status of killer whales and what can and should be done to minimize the effect of human activities on the species in Alaska. To clearly define these uncertainties and help assess what might be done to resolve them, the Commission contracted in 1991 for the preparation of a species account, with research and management recommendations, on killer whales in Alaska. The draft report was undergoing final review and editing at the end of 1992 and is expected to be published early in 1993 as an addition to the series of Alaska marine mammal species accounts published in 1988 (see Appendix B, Lentfer 1988).

The final killer whale report will address research needs and priorities for investigating stock structure, pod size and composition, and habitat-use patterns. The report will also review and make recommendations on actions to minimize direct and indirect interactions between killer whales and commercial fisheries; assess contaminant uptake and other impacts related to offshore oil and gas development and transportation and other industrial activities; and address possible effects of whale-watching activities and the tour boat industry in Prince William Sound, southeast Alaska, and other popular tourist areas.

When completed, the Commission plans to forward the report to the National Marine Fisheries Service with recommendations based on the report's findings.

Vaquita
(*Phocoena sinus*)

The vaquita, or Gulf of California harbor porpoise, is one of the rarest and least known of all small cetaceans. Found only in the northern Gulf of California or Sea of Cortez in Mexico, it has the most limited range of any marine cetacean. The species was first described taxonomically in 1958 and, prior to 1984, there were fewer than 20 records of animals either having been seen alive or recovered dead.

Between 1986 and 1989 researchers from the University of California at Santa Cruz conducted more than 2,000 miles of aerial and boat surveys, which resulted in 58 sightings involving an estimated 110 individuals. Further attempts to census the vaquita population have been even less successful. On 11-14 September 1991 researchers from the National Marine Fisheries Service's Southwest Fisheries Science Center, in cooperation with the Instituto Nacional de Pesca, La Paz, Mexico, conducted an experimental aerial census for the vaquita. The survey covered 709 miles in 3½ days and produced only one sighting of two vaquitas.

Given this paucity of data, a systematically based population estimate of the vaquita is not available. However, considering the low sighting rate relative to survey effort, the few individuals seen per sighting, and the very limited geographic range of the species, there is little doubt that the population is extremely small, perhaps numbering in the low hundreds.

The greatest direct threat to the vaquita appears to be incidental catch in gillnets, especially large-mesh nets used in fisheries for totoaba (itself an endangered species of fish), sharks, and other finfish. A number of measures have been taken to protect both the vaquita and the totoaba. Both are listed on Appendix I of the Convention on International Trade in Endangered Species of Fauna and Flora (CITES), the totoaba being added in 1977 and the vaquita in 1979. In 1978 the Government of Mexico designated the vaquita as rare and in danger of extinction, and the International Union for the Conservation of Nature and Natural Resources (now IUCN-The World Conservation Union) listed the species as vulnerable in its Red Data Book. In 1979 the National Marine Fisheries Service listed the totoaba as endangered under the U.S. Endangered Species Act, and in 1985, following a recommendation of the Marine Mammal Commission, the vaquita received the same designation. In 1991, IUCN recognized the increasing gravity of the species' condition by changing the vaquita's status in its Red Data Book from vulnerable to endangered.

As noted in previous annual reports, the Commission has encouraged and assisted in vaquita research and conservation efforts. In 1976 and again in 1979 the Commission provided funding for surveys to determine the distribution of the species (see Appendix B, Wells *et al.* 1981 and Appendix C, Villa-R.

1976). In the mid-1980s, the Commission provided support for beach surveys along the shores of the northern Gulf of California to locate the remains of dead animals and to train Mexican students in identifying, collecting, and preparing vaquita specimens for museums. In 1987, the Commission supported a study of environmental contaminants present in blubber samples of vaquitas incidentally caught and killed in fishing gear. The results of the latter study suggest that, to date, pollutants have not been a significant threat to the vaquita.

Impacts of the Totoaba Fishery

The totoaba fishery began in the mid-1920s and grew to its peak in the 1940s. Between the 1940s and the early 1970s, the totoaba catch declined dramatically. The Mexican Government responded by closing the fishery in 1975 to allow the species to recover. Despite the closure, illegal totoaba fishing continues, and the incidental mortality of vaquitas in totoaba gillnets remains substantial. Compounding the problem was the decision by the Mexican Government in 1985 to authorize experimental gillnet fishing in order to assess the status of the totoaba stock.

Although incidental take of vaquitas is known to have occurred prior to 1985, no detailed information is available. However, between February 1985 and June 1991, the deaths of 121 vaquitas in fishing activities were documented. Of these, 78 died during illegal or experimental gillnet operations for totoaba, 32 died in shark and ray gillnets, and 11 died in gillnets set for sierra (a mackerel-like fish) and in shrimp trawls. In the first two months of 1992, five vaquitas were known to have died in fishing operations. Given the facts that the monitoring effort is not comprehensive and that fishermen do not report all incidental takes of vaquitas, the actual mortality is probably much higher than reported. Whatever the mortality rate may be, it is likely that the depleted population cannot sustain the current rate of removal.

Based on a series of interviews with fishermen in 1988, researchers at the Center for the Study of Deserts and Oceans in Puerto Penasco, Mexico, and the Autonomous National University of Mexico estimated that an average of 32 vaquitas per year die in gillnets. The report concluded, among other things, that the vast majority of reported takes occurred in water depths of 25 to 160 feet, that most deaths occurred in nets with large mesh sizes, and that mortality rates resulting from gillnet entanglement were highest in the spring, the period when calving is believed to occur. The report recommended (1) closing certain areas to gillnet fishing; (2) prohibiting all sale of totoaba; and (3) developing (a) economic alternatives for gillnet fishermen, (b) public education programs focusing on conservation of marine resources in the northern Gulf of California, and (c) a vaquita management plan.

International Efforts To Protect Vaquitas

Also in 1988 the Cetacean Specialist Group of IUCN-The World Conservation Union's Species Survival Commission published an action plan for conserving the biological diversity of cetaceans throughout the world. The plan called for a three-year project to promote conservation of the vaquita, categorizing it as an undertaking of highest priority. The project, which has not yet been fully implemented, would include (1) population monitoring projects, (2) a program to monitor incidental take by fisheries, (3) a salvage-necropsy program to examine vaquita carcasses, (4) a public awareness program, and (5) a species recovery plan.

In October 1990 a Workshop on the Mortality of Cetaceans in Passive Fishing Nets and Traps was convened at the request of the International Whaling Commission with partial support from the Marine Mammal Commission. The workshop participants concluded that the vaquita's future is seriously threatened by illegal totoaba fishing and other gillnet fisheries and that inadequate enforcement and lack of economic alternatives for gillnet fishermen were compounding the problems. Highest priority was placed on the goal of immediately reducing vaquita mortality incidental to fisheries. Copies of the workshop report and recommendations were forwarded to the Secretary General of the United Nations, as well as to Commissioners and members of the Scientific Committee of the International Whaling Commission.

At its May 1991 meeting in Reykjavik, Iceland, the International Whaling Commission's Scientific Committee endorsed several recommendations of its

subcommittee on small cetaceans regarding the vaquita. The Committee concluded that the vaquita is the world's most endangered marine cetacean and recommended that (1) action be taken to fully enforce the closure of the totoaba fishery; (2) immediate action be taken to halt illegal shipments of totoaba into the United States; and (3) a management plan be developed for the vaquita and its habitat that includes (a) an evaluation of incidental take of vaquita in fisheries, (b) development of alternative fishing methods and other economically viable activities to reduce further vaquita mortality in the illegal totoaba fishery, (c) development of programs to increase awareness of the vaquita among fishermen and the public, and (d) monitoring the status and improving knowledge of the population biology of the species.

Efforts To Strengthen Import Restrictions

In November 1991 the Marine Mammal Commission wrote to the National Marine Fisheries Service and the Fish and Wildlife Service regarding the status and conservation needs of the vaquita. The Commission noted that illegal importation of totoaba appeared to be continuing and that the species was most often brought into the United States in the form of fillets. This made it impossible to distinguish totoaba from closely related species by visual inspection. Therefore the Marine Mammal Commission recommended that the Southwest Fisheries Science Center and the Fish and Wildlife Service's Forensics Laboratory work to develop a test to distinguish totoaba fillets from other fish fillets imported into the United States. The Commission recommended that once this was achieved, the two Services (1) establish a cooperative program with Mexico to coordinate efforts to enforce the longstanding Mexican prohibition on totoaba fishing and the prohibition on importing totoaba into the United States, and (2) establish programs to inform the public about the endangered status of the vaquita and the totoaba, the link between the two species, applicable prohibitions of the Endangered Species Act, and the consequences of violating the Act.

On 4 December 1991 the National Marine Fisheries Service issued a permit to the Southwest Fisheries Science Center to collect and import one whole frozen totoaba specimen for use in describing distinctive characteristics of totoaba muscle tissue and in developing a technique for biochemically differentiating totoaba fillets from closely related species. In July 1992, researchers at the Southeast Fisheries Science Center analyzed the totoaba specimen, isolated proteins unique to totoaba, and successfully developed a technique to distinguish, by biochemical means, totoaba from related species.

In 1993 substantial efforts are planned at the U.S.-Mexican border to intercept and seize totoaba. Presumably, successful seizures will result in legal action against those seeking to import this species.

Other Actions Taken in 1992

On 13 February 1992 the Mexican Secretary for Fisheries published a regulation that again placed a complete ban on the use of large mesh gillnets in the northern Gulf of California. The action reinforced the original June 1975 ban on the capture of totoaba and assigned responsibility to the Mexican Navy to enforce the ban.

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

The Committee met three times in 1992 and among other things it identified a series of research projects, some of which were started in 1992. For example,

two boat surveys were done in 1992 yielding one definite and two probable sightings of vaquitas.

On 22 April 1992 the President of Mexico signed a collaborative agreement with the Cousteau Society to establish a program for the protection and recovery of the vaquita and the totoaba. Among other things, the agreement declares the Gulf of California to be a marine sanctuary and prohibits fishing methods that kill or injure either vaquitas or totoabas. The exact size of the sanctuary, however, has not been established. The declaration also calls for participation by the Cousteau Society in an educational awareness program on both species for fishermen, fishing industry personnel, and the general public.

During 1992 the Marine Mammal Commission worked with a coalition, organized by Conservation International, of non-governmental organizations, Federal agencies, and private foundations, to review and consider a proposal from Mexican and U.S. researchers to examine the economic impact of fishing restrictions in the northern Gulf of California and to provide recommendations on economic alternatives. The project calls for developing a geographic information system to identify and track ecological changes in critical areas; examining the economic impact of eliminating certain problem fisheries; and studying life history parameters and mortality rates of vaquitas. The project received partial funding in 1992 from several organizations, and additional support is expected in 1993.

On 28 May 1992 Defenders of Wildlife petitioned the Secretary of Commerce to issue regulations requiring that bony fish entering the United States from the Gulf of California have intact heads and tails, thus permitting the visual identification of totoaba by enforcement agents. The action, requested under the Administrative Procedure Act, the Endangered Species Act, the Marine Mammal Protection Act, and the Lacey Act, sought to stop the importation of illegally caught totoaba. The group also asked that, if this ruling were not expedited, the Department of Commerce list the five finfish species closely related to totoaba as endangered under the "similarity of appearance" provision of the Endangered Species Act. By the end of 1992, the National Marine Fisheries Service had not ruled on the petition.

Recognizing the need for an agreed framework for coordination of the many international efforts to protect the vaquita, the Marine Mammal Commission consulted with the chairman of Mexico's Technical Committee for the Preservation of the Totoaba and the Vaquita about whether the Commission might usefully provide assistance for the development of a recovery plan. The idea was acceptable and support was provided for the chairman to develop a vaquita recovery plan (see Chapter X) to encourage, guide, and coordinate research, conservation, and management efforts by environmental organizations, research institutions, and government agencies of Mexico and the United States. The preliminary draft recovery plan calls for the following actions: an assessment of population size, status, and trends; studies of distribution and range; life history, natural history, and ecological studies; development and implementation of programs to educate fishermen and the general public on the vaquita and its plight and on the more general need for conservation of marine resources; socio-economic studies; and investigation of economic alternatives to gillnet fishing. The final plan is expected to be made available by the chairman of the technical committee early in 1993.

The Marine Mammal Commission will help further actions outlined in the plan to preserve and protect the remaining vaquita population.

Harbor Porpoise
(*Phocoena phocoena*)

The harbor porpoise occurs largely in coastal areas throughout the cold temperate and sub-arctic Northern Hemisphere, including Europe, Russia, the Far East, and the east and west coasts of North America. Animals have been observed as far south as northern West Africa. The species' nearshore distribution makes it vulnerable to impacts from human activities, particularly coastal fisheries and environmental pollution.

Substantial numbers of harbor porpoises are killed incidentally in U.S. fisheries. In 1991 the most recent year for which data are available, harbor porpoises were taken in the groundfish sink gillnet fishery in the

Gulf of Maine; the salmon drift gillnet and set gillnet fisheries, both in Alaska waters and Puget Sound; and the swordfish and thresher shark drift gillnet and salmon troll fisheries off the coasts of Washington, Oregon, and California. Harbor porpoises are also taken incidentally in fisheries off the east and west coasts of Canada, and these animals may be from the same populations being affected by U.S. fisheries.

The subcommittee on small cetaceans of the International Whaling Commission's Scientific Committee reviewed the incidental take of harbor porpoises, and in a report issued in 1990, it concluded that the problem may exist wherever gillnet fisheries operate in proximity to harbor porpoises. It further noted that the level of incidental take may be especially high in the North and Baltic Seas. Outside the United States, direct as well as incidental take of harbor porpoises has been significant in some areas. As noted in the previous annual report, a large-scale Turkish fishery for harbor porpoises operated in the Black Sea from 1976 until 1983 when the fishery was suspended (for further discussion of harbor porpoises in the Black Sea, see Appendix B, Buckland 1990). Currently, the only known directed fishery for harbor porpoises is in Greenland, where from 700 to 1,000 animals are taken annually for local consumption from a total estimated population of 10,000-15,000.

Harbor Porpoises in the Gulf of Maine and the Bay of Fundy

In U.S. coastal waters, the number, size, discreteness, and productivity of harbor porpoise populations have not been well documented, making it difficult to judge whether levels of take have caused or are causing one or more populations to be reduced below their maximum net productivity level.

In 1990 and again in 1991, the International Whaling Commission Scientific Committee's subcommittee on small cetaceans recommended a number of research projects on harbor porpoises in the western North Atlantic. Specifically, the subcommittee recommended that research be undertaken to (1) improve understanding of harbor porpoise population discreteness; (2) estimate population abundance; (3) refine estimates of the magnitude of direct and incidental take; (4) conduct a joint U.S.-Canadian comprehensive survey of the Gulf of Maine and Bay of Fundy; (5) address the degradation of coastal habitat; and (6) address the effects of contaminants on harbor porpoise populations. The subcommittee also recommended that levels of harbor porpoise mortality due to incidental take throughout their range be reduced by modifying or converting gear types or by implementing area or seasonal closures of certain fisheries.

In December 1991 the National Marine Fisheries Service's Northeast Fisheries Science Center published a report addressing harbor porpoise abundance in the Gulf of Maine and Bay of Fundy, based on the results of two at-sea surveys conducted in the summer of 1991. Because of uncertainty as to the number of duplicate sightings of animals, the report presented two preliminary estimates of abundance: 66,000 animals, based on the lower estimate of duplicate sightings, and 45,000 animals, based on the higher estimate. In either case, the number of harbor porpoises in the Gulf of Maine and Bay of Fundy was substantially higher than had been estimated. A previous survey, conducted in 1981 by the New England Aquarium with the support of the National Marine Fisheries Service, resulted in estimates of between 8,000 and 15,000 harbor porpoises along the coast of Maine.

The Service's 1991 report also provided a new estimate of the level of incidental take in Gulf of Maine sink gillnet fisheries. This estimate was derived from observations of incidental take by commercial groundfish gillnet vessels fishing in the Gulf from June 1989 through May 1991. During this period, observers were present on slightly more than one percent of fishing trips, and 34 harbor porpoises were observed to be taken. Preliminary estimates extrapolated from these data indicate that at least 1,250 harbor porpoises were killed each year in the Gulf of Maine fishery. This represents about 2.8 percent of the Northeast Fisheries Science Center's lower population abundance estimate and about 1.9 percent of the higher estimate. Previous estimates were much lower.

During 1991 representatives of the National Marine Fisheries Service, the Canadian Department of Fisher-

ies and Oceans, independent research organizations, fisheries organizations, academic institutions, and wildlife conservation organizations cooperated in establishing a Harbor Porpoise Working Group. Its purposes are to define the extent of the problem and identify solutions pertaining to harbor porpoises and commercial fisheries interactions in the Gulf of Maine, and more specifically to reduce the incidental take of harbor porpoises in gillnets while minimizing impacts on the fishery.

In March 1992 the Commission received a draft action plan developed by the Harbor Porpoise Working Group. The plan makes a number of recommendations intended to improve knowledge of harbor porpoise biology, mitigate interactions between porpoises and commercial fisheries, increase availability and exchange of information, and improve educational efforts. The plan relies heavily on the National Marine Fisheries Service's December 1991 report and recommends additional and expanded studies of harbor porpoise abundance and incidental take in commercial fisheries in order to build on the preliminary estimates provided by the Service. With regard to fisheries interactions, the working group concluded that regardless of the size of the harbor porpoise population in the Gulf of Maine, it is a desirable goal at this time to reduce the take of animals in commercial fishing operations. To this end, the working group recommended (1) greater efforts at documenting incidental take, (2) studies to evaluate gear designs and alternative gear types, and (3) further research on harbor porpoise behavior in general, specifically with relation to entanglement in fishing gear. The working group also recommended increasing communication and education efforts to better disseminate information to researchers, fishermen, environmental groups, and resource managers.

Consistent with the recommendations of the IWC's Scientific Committee and the Harbor Porpoise Working Group, the National Marine Fisheries Service's Northeast Fisheries Science Center sponsored a workshop on 5-8 May 1992 to assess the status of harbor porpoises in the northwestern Atlantic Ocean and to identify information gaps and research needs. Regarding the Gulf of Maine and Bay of Fundy, the workshop based its review on a revised estimate of harbor porpoise abundance of 45,000 animals. This was based on the same data discussed in the Service's December 1991 report.

In July 1992 the report of the above workshop, "Harbor Porpoise in Eastern North America: Status and Research Needs," was distributed to the Marine Mammal Commission and others. In the report, the workshop recommended research to fill information gaps in areas such as seasonal distribution and population structure; demographics, including information on rates of survival, reproduction, development, and growth; population sizes and discreteness; trends in abundance; predator-prey relationships; and the extent, location, and levels of direct and indirect human-induced mortality. The report cited annual mortality of harbor porpoises from incidental take in commercial fisheries in the northwestern Atlantic of five percent in 1990 and four percent in 1991. The report noted that based on available data, the ratio of incidental take to population size for harbor porpoises in the region may be greater than the recommendation made by the International Whaling Commission's Scientific Committee of a maximum mortality rate for harbor porpoise. Thus, it recommended that the level of incidental take be reduced. The workshop report also noted that information is insufficient to assess the effect of incidental take on harbor porpoises in fisheries in Newfoundland and the St. Lawrence River delta. Therefore, it recommended that surveys of abundance be initiated and that estimates of incidental take be improved.

At the International Whaling Commission's annual meeting in Glasgow, Scotland, on 9-22 June 1992, the Scientific Committee's subcommittee on small cetaceans endorsed the recommendations of the National Marine Fisheries Service's May 1992 harbor porpoise workshop and reiterated the recommendations made by its subcommittee in 1990 and 1991.

U.S. Efforts To Protect Harbor Porpoises

Several actions have been taken to afford protective status to harbor porpoises in U.S. waters. As discussed in past annual reports, in August 1990 a group of scientists representing universities and research organizations in the northeastern United States and eastern Canada wrote to the Marine Mammal Commission to state its concern about incidental take of

harbor porpoises in commercial fisheries in the Gulf of Maine. The group recommended, among other things, that the harbor porpoise in that area be listed either as threatened or endangered under the Endangered Species Act. The Commission forwarded the letter to the National Marine Fisheries Service in October 1990, advising the Service that it agreed that there was reason to believe that incidental take may be having a significant adverse effect on harbor porpoises in the northwestern Atlantic. The Commission further noted that incidental take in commercial fisheries also may be having a significant adverse effect on harbor porpoises off central California and possibly off Washington and Alaska. The Commission therefore requested that the Service advise it as to what was being done or planned to assess and monitor the status of harbor porpoise populations in these regions.

On 12 February 1991 the Service published in the *Federal Register* a notice of intent to conduct a status review and a request for information to determine whether the species or any distinct population of harbor porpoises should be designated as depleted under the Marine Mammal Protection Act. During the ensuing months, the Service made no formal determination on the status of harbor porpoises in the northwestern Atlantic, and on 17 September 1991 the Sierra Club Legal Defense Fund, acting on behalf of 13 environmental and conservation organizations, petitioned the Service to list the Gulf of Maine/Bay of Fundy harbor porpoise population as threatened under the Endangered Species Act. On 13 December 1991 the Service published a notice of receipt of the petition in the *Federal Register*, requesting comments and noting that substantial information had been received with the petition indicating that the listing may be warranted.

Late in 1992 the National Marine Fisheries Service publicly announced that a proposed rule to list the Gulf of Maine/Bay of Fundy harbor porpoise population as threatened under the Endangered Species Act would be published in the *Federal Register* in January 1993.

As a related matter, by letter of 23 October 1992 the Service advised the Commission that it had received a number of proposals from staff researchers at the Service's regional science centers to fund marine mammal population assessment projects to be undertaken during Fiscal Year 1993. Two of the proposals concerned harbor porpoise populations in the northwestern Atlantic and two others involved populations on the west coast of the United States. The Service requested that the Commission review and comment on the proposals before it took action on them. The Commission agreed to do so.

The two proposals related to northwestern Atlantic populations are to continue research on harbor porpoise abundance and migration in the Gulf of Maine and Bay of Fundy, and to assess marine mammal bycatch and biology in commercial fisheries in New England and the mid-Atlantic states, particularly the Gulf of Maine groundfish sink gillnet fishery. The Commission, by letter of 3 December 1992, advised the Service that, as it understood the proposals, the basic purpose of the proposed studies is to obtain information necessary to implement the Service's proposed regime to govern interactions between marine mammals and commercial fishing operations. In its letter the Commission noted that the proposal related to abundance and migration research sought funding for a range of related, but largely independent studies, the objectives of which are to (1) determine the seasonal migratory patterns of harbor porpoises in the Gulf of Maine, the Bay of Fundy, southern Nova Scotia, southern New England, and the mid-Atlantic region, (2) identify sources of bycatch mortality other than the Gulf of Maine and Bay of Fundy sink gillnet fishery, (3) predict the likely effect of time and area fishing restrictions on total bycatch levels, and (4) develop procedures for long-term monitoring of the abundance of harbor porpoises and the effects of harbor porpoise bycatch in U.S. and Canadian fisheries. The Commission noted that insufficient information was given to ascertain how the proposed study would meet the second objective. It also noted that additional work likely would be necessary to meet the fourth objective.

With regard to the proposed study of marine mammal bycatch and biology, the Commission noted that certain objectives of this study are to use data and specimens collected in an observer program to (1) estimate the number of harbor porpoises being caught incidentally in fisheries in the New England and mid-Atlantic areas, (2) determine the biological signifi-

cance of the estimated bycatch, and (3) evaluate possible means such as season and area closures to reduce bycatch. The Commission also noted that if study objectives are met, proposed research will provide a substantial amount of the information needed to begin implementing the Service's proposed regime to govern interactions between marine mammals and commercial fisheries in the northeast and mid-Atlantic regions. The Commission also noted, however, that sufficient information was not provided to judge whether the objectives could be met in 1993.

At the end of 1992, the Commission had not been advised as to the levels of funding to be allocated to implement these proposals or whether funding would be adequate to meet the stated research objectives.

Harbor Porpoises off California, Oregon, Washington, and Alaska

As discussed in past annual reports, concern has been raised over the status of harbor porpoises in waters off the central coast of California and the coasts of Oregon, Washington, and Alaska.

As noted above, on 12 February 1991 the Service announced that it would review the status of harbor porpoises throughout U.S. waters. On 24 May 1991 the Service published a follow-up notice stating that it had determined that there is no information available to indicate that harbor porpoises off the west coast of the United States are below their optimum sustainable population level, and it was therefore terminating that portion of its status review.

In its June 1991 draft legislative environmental impact statement on its proposed regime to govern interactions between marine mammals and commercial fishing operations, the Service noted that harbor porpoise populations off the west coast of North America may be at optimum sustainable population levels, but that their susceptibility to incidental take in coastal gillnet fisheries is nonetheless a cause for concern. The Service therefore proposed that actions be taken to protect local harbor porpoise populations.

On 23 September 1991 the Marine Mammal Commission wrote to the Service regarding the draft environmental impact statement, noting that (1) the Service's proposed regime to manage interactions between marine mammals and commercial fishing operations was intended to ensure that no marine mammal population would be adversely affected by levels of take authorized under the regime, and (2) this premise appears to be violated with respect to harbor porpoises because the best available data indicate that there is a relatively discrete population of harbor porpoises in central California that may have been depleted as a result of incidental take in set net fisheries. The Commission therefore recommended that the Service consider the possibility that incidental take has lowered the population density of harbor porpoises in localized areas. For further discussion of the Service's proposed regime, see Chapter II.

As noted above, on 23 October 1992 the Service asked the Commission to review and provide comments on marine mammal research proposals submitted by its regional science centers. Two proposals were for studies of harbor porpoises off the west coast and in Alaska. The objective of the proposed Alaska study is to obtain minimum population estimates of harbor porpoises in Alaska coastal waters. The Commission, in its 3 December 1992 letter to the Service commenting on the proposals, noted that the proposal indicates that harbor porpoises are commonly caught incidentally in commercial and subsistence fisheries in Alaska, but that the nature and magnitude of the incidental take are unknown. However, the proposal does not indicate what is being done, nor does it propose any steps to document the nature and magnitude of the incidental take. The Commission also noted that certain assumptions are made in the proposal that (1) there is no significant annual variation in the distribution or abundance of harbor porpoises in the seven distinct coastal areas to be surveyed, and (2) all harbor porpoises in Alaska coastal waters are part of the same population and are not subject to significant incidental take or other nonnatural sources of mortality outside of Alaska coastal waters. The Commission further noted that if the validity of the aforementioned assumptions has not been verified, the population estimate likely to be obtained from past and proposed surveys may be insufficient. The Commission therefore recommended that before providing additional funds for this program, the Service ensure that the data needs have

been fully identified and that completing the survey program, as proposed, will meet the minimum data needs.

The second proposal is to continue an assessment of harbor porpoises in Washington and Oregon. The objectives of this study are to (1) calculate a "best" and "minimum" population estimate, (2) determine stock structure, and (3) determine relative distribution and abundance by season, water depth, and geographic location, especially along the northwestern coast of Washington in areas where porpoises are incidentally taken in the salmon set gillnet fishery. The Commission noted in its 3 December 1992 letter that the proposal seems likely to meet the stated objectives, but that further studies may be necessary to obtain both a "best" and "minimum" population estimate if there is a substantial between-year variation in either distribution or abundance. The Commission recommended that if it had not already done so, the Service compare the sighting and incidental catch data to determine whether incidental take might be avoided or reduced by altering fishing seasons, areas, gear types, or practices. The Commission also recommended that if the Service had not already done so, it convene a workshop to compare, evaluate, and standardize the methods being used to assess and monitor harbor porpoise abundance in the northeastern United States, Alaska, Washington, Oregon, and California.

The Marine Mammal Commission remains concerned about the status of harbor porpoises in U.S. waters and elsewhere and in 1993 the Commission will continue to review actions taken and provide advice to the National Marine Fisheries Service.

Bottlenose Dolphin (*Tursiops truncatus*)

The bottlenose dolphin occurs throughout the temperate and tropical oceans of the world, frequently in nearshore waters. It is the most common cetacean species in the coastal waters of the southeastern United States, and the species most frequently maintained in captivity for public display and scientific research. Capture of bottlenose dolphins for these purposes began in the early 1900s in the United States. Considerable although unknown numbers of animals were taken prior to the enactment of the Marine Mammal Protection Act in 1972. A permit procedure for taking marine mammals was implemented under the Act, and since 1972 permits have been issued for collection of more than 500 bottlenose dolphins from U.S. waters.

As discussed in previous annual reports, the discreteness and status of local and regional bottlenose dolphin populations in U.S. waters are uncertain. It is unlikely, however, that capture and removal alone have caused significant declines in the affected populations. Unusual mortality events involving bottlenose dolphins appear to be a recurring phenomenon. Large-scale mortality of bottlenose dolphins occurred along the U.S. Atlantic coast in 1987-1988, along the coast of the Gulf of Mexico in 1990, and again off the coast of Texas in 1992. These events may have caused significant declines in these populations and are discussed in Chapter VI.

Also, unknown but potentially significant numbers of bottlenose dolphins are killed incidentally in fisheries for menhaden, shark, shrimp, swordfish, and other species in the coastal waters of the southeastern United States and the Gulf of Mexico. In some areas, bottlenose dolphins and their habitat also may be affected by marine and coastal pollution, oil and gas development, dredging and dredge spoil disposal, and other activities.

The independent and collective effects of unusual mortality events and various human activities have not been determined. It is possible that one or more local bottlenose dolphin populations have been depleted and that their recovery is being prevented or impeded by continued taking. It also is possible that essential habitat has been or is being damaged or destroyed by pollution, dredging, and other activities.

Mid-Atlantic Coastal Migratory Population

Between June 1987 and May 1988, more than 740 bottlenose dolphins washed up along the Atlantic coast between New Jersey and Florida. Although the results are not conclusive, post-mortem examinations suggest that the proximate cause of the die-off was brevetoxin, a neurotoxin produced by the dinoflagellate *Gymnodinium breve*, which also causes red tide.

The brevetoxin is postulated to have made the animals susceptible to a number of bacterial and viral pathogens that ultimately killed them.

The National Marine Fisheries Service estimated that the 1987-1988 mass mortality may have reduced the mid-Atlantic coastal migratory stock of bottlenose dolphins by as much as 60 percent. On 11 November 1988, the Center for Marine Conservation petitioned the Service to list the affected mid-Atlantic coastal migratory population of bottlenose dolphins as depleted under the Marine Mammal Protection Act. The Service published an advance notice of proposed rulemaking and a request for comments on the proposal on 11 October 1989. In a 21 December 1989 letter to the Service, the Commission noted that the depleted designation probably was merited, but that it was based on a number of assumptions that if not validated would make it impossible to determine when the population had recovered and could be delisted. The Commission recommended that the Service not list the population as depleted without simultaneously describing the steps that would be taken to verify the assumptions upon which the designation was based and determine when the population no longer is depleted. The Commission also recommended that before designating the population as depleted, the Service develop and implement a conservation plan for bottlenose dolphins along the U.S. mid-Atlantic coast.

As noted in the Commission's previous annual report, on 15 August 1991 the Service published a *Federal Register* notice proposing to designate the mid-Atlantic coastal migratory population of bottlenose dolphins as depleted under the Marine Mammal Protection Act. The Commission, in consultation with its Committee of Scientific Advisors, reviewed the proposal and provided comments to the Service on 4 November 1991. The Commission noted that the *Federal Register* notice failed to address the concerns raised in the Commission's 21 December 1989 letter regarding the proposed listing. The Commission, therefore, reiterated its recommendations that a conservation plan be developed and implemented before designating the population as depleted, and that the Service describe the steps to be taken to verify the assumptions on which the designation was based and to determine when the population was no longer depleted. As of the end of 1992 the Service had not designated the affected population as depleted or developed a conservation plan to guide recovery.

As a related matter, the Service, in its proposed regime to govern interactions between marine mammals and commercial fishing operations (see Chapter IV), classified the mid-Atlantic coastal bottlenose dolphin population as a Class alpha (α) stock. This classification is warranted under certain conditions: (1) if the estimated total removals from a population as a result of human activities are equal to or greater than that which can be sustained without causing the population to be reduced or be maintained below its maximum net productivity level, or (2) if the species or population is designated as depleted under the Marine Mammal Protection Act or threatened or endangered under the Endangered Species Act. Under the proposed regime, the Class α designation would provide that all fisheries that have significant interactions with the population may be required to carry observers on as much as 100 percent of their fishing trips in order to obtain statistically reliable information on the species and number of marine mammals taken incidentally in the fishery. This compares to a current requirement for 25 to 35 percent observer coverage.

Gulf of Mexico and Florida East Coast Populations

Bottlenose dolphins taken for research or public display have been taken most frequently from the Gulf of Mexico and the Indian River system in east-central Florida. As discussed in previous annual reports, because of uncertainties stemming from recent mass mortalities (see Chapter VI), in April 1989 the Marine Mammal Commission suspended consideration of all applications for permits to take bottlenose dolphins from the Gulf of Mexico and the east coast of Florida, pending an assessment of the status of the affected populations and the effectiveness of then-existing research and management programs.

In a 16 March 1990 letter to the National Marine Fisheries Service, the Commission noted that the unusually high mortality of bottlenose dolphins that had been occurring in the Gulf of Mexico since January of that year could be caused by a contagious

disease. To prevent any such disease from being transmitted to captive animals, the Commission recommended that the Service suspend all live captures and removals of bottlenose dolphins from the Gulf of Mexico. On 2 April 1990, the Service advised the Commission that all permit holders had voluntarily agreed to suspend capture of bottlenose dolphins in the Gulf for 90 days to allow time to evaluate the die-off.

On 31 May 1990 the Service published in the *Federal Register* a proposed rule to establish regulations and revise quotas for removal of bottlenose dolphins for purposes of research and public display. Because of uncertainty regarding the status of the potentially affected bottlenose dolphin populations in the Gulf of Mexico, the Service wrote to permit holders on 20 August 1990 asking them not to collect bottlenose dolphins until 1991 or 1992 except in situations where collection was absolutely necessary to maintain a public display. Permit holders agreed, and since that time no animals have been taken from the Gulf of Mexico for purposes of public display or scientific research. As of the end of 1992 the Service had not promulgated revised regulations or quotas regarding live capture and removals for public display and research.

As it did for the U.S. mid-Atlantic coastal population, the Service, in its proposed regime to govern interactions between marine mammals and commercial fishing operations, designated the eastern Gulf of Mexico population of bottlenose dolphins as a Class α stock. The Service did not propose an α classification for bottlenose dolphins in the western Gulf of Mexico.

Feeding Dolphins in the Wild

Feeding wild marine mammals may adversely affect them by increasing the potential for interactions with motor boats and other vessels, increasing reliance on non-natural sources of food, conditioning animals to expect food from people, and altering migratory patterns by causing the animals to ignore seasonal changes in food availability or other variables. Some commercial tour operators have incorporated feeding of wild dolphins into their programs to improve marketing. The Commission believes that such programs are contrary to the intent and provisions of the Marine Mammal Protection Act and has advised the National Marine Fisheries Service accordingly. Feeding dolphins in the wild, as well as other issues involving bottlenose dolphins, including captive display and swim-with-the-dolphin programs, are discussed further in Chapter XI of this report.

Polar Bear
(*Ursus maritimus*)

The polar bear occurs in most ice-covered seas of the northern hemisphere. The species is circumpolar in distribution and has been seen as far north as 88 degrees north latitude, and off the Alaska coast as far south as St. Matthew Island in the Bering Sea. Available information indicates that two relatively discrete polar bear populations occur in Alaska — a western (Bering/Chukchi Seas) population shared with Russia and an eastern (Beaufort Sea) population shared with Canada. While reliable information on the sizes of these populations is not available, the most widely accepted estimate for the total Alaska population is 3,000 to 5,000 animals.

Throughout the first half of this century, polar bears were taken primarily for subsistence purposes and for the sale of hides by Natives hunting with dog teams. In the late 1940s, trophy hunters, using professional guides, began hunting polar bears from aircraft, substantially increasing the pressure on the Alaska polar bear population. In 1961, the State of Alaska adopted regulations restricting the sport hunting season and requiring sport hunters to present all polar bear skins for marking and examination. At the same time, preference was provided for subsistence hunters and protection was afforded cubs and females with cubs. Between 1961 and 1972, an average of 260 polar bears were taken annually in Alaska, 75 percent of which were males. In 1972, the State of Alaska banned hunting from aircraft.

In 1972 enactment of the Marine Mammal Protection Act transferred management responsibility for polar bears and other marine mammals from the State to the Federal Government. Under the Act, hunting is prohibited except that Alaska Natives are allowed to

take polar bears for subsistence purposes and for purposes of creating and selling traditional handicrafts and clothing. The Act does not restrict the number of animals that can be taken or the take of cubs or females with cubs, provided that the take is not wasteful.

In 1973 the Governments of Canada, Denmark (for Greenland), Norway, the Soviet Union, and the United States concluded an agreement to conserve polar bears and their habitat throughout the Arctic. Efforts to implement this agreement are described below.

Preparation of a Polar Bear Conservation Plan

The 1988 amendments to the Marine Mammal Protection Act directed the Secretaries of the Interior and Commerce to develop conservation plans for depleted marine mammals species and populations, and when appropriate, for non-depleted species and populations. On 11 January 1989 the Marine Mammal Commission wrote to the Fish and Wildlife Service suggesting that the Service prepare conservation plans for polar bears, walruses, and sea otters. The Service concurred with the Commission's recommendation, but due to demands placed on its resources by the *Exxon Valdez* oil spill, the Service was not able to proceed promptly with development of the agreed conservation plans.

During the annual meeting of the Commission and its Committee of Scientific Advisors in April 1991, representatives of the Commission and the Fish and Wildlife Service discussed the Service's progress in drafting conservation plans for the Alaska populations of these three species. At that meeting, the Commission offered to assist the Service in developing draft plans that could be used to expedite completion and adoption of conservation plans. The Service accepted the Commission's offer.

On 28 June 1992 the Commission forwarded to the Service a draft conservation plan for polar bears. The draft plan identifies and provides the rationale for research and management actions necessary to identify and maintain polar bear populations in Alaska within their optimum sustainable population range, as required by the Marine Mammal Protection Act. In its letter accompanying the draft plan, the Commission noted that the Service had constituted a planning group, including representatives of the environmental community and Native and industry groups, to assist in identifying potential polar bear conservation problems and possible solutions. The Commission recommended that the Service: (1) provide the draft conservation plan to the group for review and comment; (2) use the draft plan and the planning group's comments on the draft as the basis for preparing a final draft conservation plan; and (3) circulate the final draft plan to the Commission and others for agency and public review and comment prior to its adoption.

In its letter the Commission also identified a number of actions that it considered deserving of priority attention. These included:

(1) **Determining whether oil and gas exploration and development in the Arctic National Wildlife Refuge would be to the disadvantage of polar bears** — The Commission noted that available information indicates that the coastal plain of the Arctic National Wildlife Refuge is the most important on-land polar bear denning area in Alaska. Available information is insufficient, however, to determine the degree to which the Beaufort Sea polar bear population might be affected by oil and gas exploration and development in the Refuge. The Commission pointed out that high priority should be placed on determining and conducting population, movement, and "effects" studies necessary to determine the extent to which oil and gas activities might affect the polar bear population shared with Canada and ways in which possible adverse effects might be avoided or mitigated.

(2) **Implementation of the Agreement on the Conservation of Polar Bears** — The Commission noted that when the Agreement on the Conservation of Polar Bears was ratified by the United States in 1976, it was assumed that the Marine Mammal Protection Act of 1972 provided adequate statutory authority to implement all its provisions. The assumption may not be valid and, as discussed in previous annual reports, the Commission has recommended that the Fish and Wildlife Service undertake a review to determine whether additional legislation or regulations may be needed to effectively implement the polar bear agreement. By letter of 24 December 1991, the Service

advised the Commission that it proposed to ask its Polar Bear Management Planning Team to review and provide advice on the need for additional legislation or regulations.

In its 28 June 1992 letter accompanying the draft conservation plan, the Commission questioned whether the Polar Bear Management Planning Team had the expertise necessary to made the determination. The Commission recommended that the Department's Solicitor's Office, in consultation with the Department of State's Office of Oceans and Polar Affairs, be asked to identify such additional legislation or regulations as may be necessary for the United States to effectively implement all provisions of the Agreement. Other action taken by the Commission in this regard is discussed in a following section of this chapter.

(3) **Development of site-specific polar bear interaction plans** — The increasing level of industrial activities in the Arctic, particularly those related to oil and gas exploration and development, brings with it an increasing probability of interactions between polar bears and people, with potential risk of death and injury to both bears and people. In January 1989 the Commission held a workshop in Anchorage, Alaska, to determine measures necessary to assess and mitigate possible adverse effects of arctic oil and gas activities on polar bears. The report of the workshop (see Appendix B, Lentfer 1990) recommended, among other things, that site-specific polar bear interaction plans be developed to minimize the possibility of bears either jeopardizing or being jeopardized by such activities.

In its letter forwarding the draft polar bear conservation plan to the Fish and Wildlife Service, the Commission noted its understanding that the Service was working with the Minerals Management Service, relevant state agencies, and industry groups to facilitate development, adoption, and implementation of site-specific polar bear interaction plans, but that it did not know precisely what was being done. Therefore, the Commission asked that the Fish and Wildlife Service advise it of specific steps that had been taken to require development of site-specific interaction plans for all areas where polar bears are likely to come into contact with industrial activities, and of any problems that have been encountered in developing such plans.

(4) **Harvest monitoring** — A number of uncertainties exist regarding the accuracy of information being obtained on the subsistence take of polar bears by Alaska Natives and on the adequacy of U.S.-Canadian cooperative efforts to ensure that Native taking does not cause the Beaufort Sea polar bear population to be reduced below its maximum net productivity level. Furthermore, it is not clear whether there is a need for a cooperative program between the United States and Russia to govern the taking of polar bears from the Bering/Chukchi Seas population.

To resolve these uncertainties, the Commission indicated that the Service should place high priority on (1) reviewing its marking and tagging program and as necessary expanding information, education, and enforcement programs to ensure that it is getting accurate information on the number, age, sex, and general condition of polar bears being taken by Alaska Natives for subsistence and handicraft purposes; (2) working with appropriate representatives of coastal Alaska communities to ensure that Native hunters are fully aware of and are complying with the provisions of the Agreement between the North Slope Borough's Fish and Game Management Committee and the Inuvialuit Game Council of the Northwest Territories (discussed below under "Native Subsistence Hunting"); and (3) consulting polar bear biologists and managers in Russia to determine if commercial or recreational hunting has been or is likely to be resumed in eastern Siberia and, if so, taking measures to establish a cooperative management program.

(5) **Better determine population discreteness, status, and trends** — In its letter, the Commission noted that available information suggests that polar bears inhabiting Alaska and adjacent areas are from two relatively discrete populations, both of which are probably either at or above their maximum net productivity level. The Commission added, however, that to its knowledge available data had not been evaluated to determine the likely carrying capacity and maximum net productivity levels of the two populations. Nor had data been evaluated to determine what additional data if any would be required to make these

determinations and to determine whether the populations are in fact stable, increasing, or decreasing. Likewise, the Commission noted that it was not clear whether ongoing or planned population monitoring programs will be sufficient to ensure that neither of the shared polar bear populations in Alaska is reduced or maintained below its maximum net productivity level.

In the Commission's view, these issues should be considered as a matter of priority by the Service's Polar Bear Management Planning Team. It therefore recommended that the Service, if it had not already done so, compile and provide to the planning team all available information on the discreteness, size, status, trends, and vital parameters of the Bering/Chukchi and Beaufort Seas polar bear populations.

As of the end of 1992, the Commission had not yet received a reply to its June 1992 letter. It understood, however, that the polar bear conservation plan was undergoing internal review within the Fish and Wildlife Service and would be available for agency and public review by mid-January 1993.

Agreement on Conservation of Polar Bears

Increased hunting of polar bears in the 1950s and 1960s and concerns about the effects of industrial activities on polar bears and their habitat led to an international dialogue on the need to conserve polar bears throughout the Arctic. In 1973, the Governments of Canada, Denmark (for Greenland), Norway, the Soviet Union, and the United States concluded negotiations for the Agreement on the Conservation of Polar Bears. Article I of the Agreement prohibits the taking of polar bears, subject to certain exceptions. Article II requires that each of the contracting parties "take appropriate action to protect the ecosystems of which polar bears are a part, with special attention to habitat components such as denning and feeding sites and migration patterns ...." The parties also agreed to a resolution banning the hunting of cubs, female bears with cubs, and bears moving into denning areas or in dens.

As noted above, the Marine Mammal Commission and others have questioned whether the Marine Mammal Protection Act or other statutes provide sufficient legal authority for the United States to fully implement the Agreement. On 6 July 1992, the Environmental Defense Fund wrote to the Department of State's Bureau of Oceans and International Environmental and Scientific Affairs seeking information on the status of the polar bear Agreement. In particular, the Fund raised the question of whether the Agreement had been fully implemented within the United States.

In response to such uncertainties, on 21 September 1992 the Bureau hosted a meeting of representatives of interested Federal agencies to review U.S. implementation of the 1976 polar bear agreement. A representative of the Marine Mammal Commission participated in the meeting. In addition, on 17 September 1992 the Commission contracted with an attorney familiar with the issues to conduct a comprehensive legal assessment of (1) in what ways, if any, the Marine Mammal Protection Act or other domestic statutes fail to provide adequate authority for the United States to fully implement the provisions of the Agreement; (2) whether the United States may have failed or is failing to meet any of its obligations under the Agreement, and if so, in what ways; (3) whether additional statutory authority, regulations, or other measures may be necessary to enable the United States to fully meet its obligations; and (4) any changes in the Agreement that the United States should consider to clarify its provisions or otherwise provide for the effective conservation of polar bears and their habitat throughout the Arctic.

The report is expected to be available early in 1993. It will be provided to the Department of State and the Fish and Wildlife Service, along with recommendations for follow-up actions as may be necessary to ensure that the United States can fully implement the Agreement.

Native Subsistence Hunting

As noted earlier, prior to passage of the Marine Mammal Protection Act in 1972, hunting of polar bears in Alaska was managed by the State. The Act transferred management authority to the Fish and Wildlife Service, and exempted coastal Alaska Natives from its prohibitions on taking when the taking is nonwasteful and for subsistence or handicraft purposes.

The Act authorizes the Fish and Wildlife Service to prescribe regulations necessary to monitor the number, age, and sex of polar bears taken by Alaska Natives, but prohibits limiting the take unless it is wasteful or the affected population is depleted.

The Beaufort Sea polar bear population is hunted by Natives from northwestern Canada as well as Alaska. If not regulated effectively, such hunting, by itself and in combination with other activities, could cause the population to decline below its optimum sustainable population level. Recognizing this, the Fish and Game Management Committee of Alaska's North Slope Borough and the Inuvialuit Game Council of Canada's Northwest Territories entered into an agreement in January 1988 to govern cooperatively the hunting of polar bears in the area between Icy Cape, Alaska, and the Baillie Islands, Canada.

Among other things, the agreement calls for protection of cubs, females with cubs, and all bears inhabiting or constructing dens. It also prohibits hunting at certain times of the year and provides that a harvest quota, based upon the best available scientific evidence, be established annually. Quotas are to be allocated equitably between Natives in Alaska and Canada, and data are to be collected and shared on the number, location, age, and sex of bears killed. As a matter of Federal law, the agreement has no legal status in Alaska or Canada and does not provide for enforcement and penalties in Alaska. Thus, its success depends upon voluntary compliance. Also, it does not apply to Native subsistence hunting of polar bears in Alaska south of Icy Cape.

Under the terms of the agreement, the initial annual harvest allocation was 38 bears each for Canadian and Alaska Natives. During the first harvest year (1988-1989), Alaska hunters took 58 bears, exceeding the harvest limit by 20 animals, while the Canadian harvest totaled 32 bears. During the 1989-1990 harvest, 24 bears were taken in the Alaska sector and 34 in Canada, both less than the established allocation. It is believed that the reduced take was due to an increased awareness of the terms of the agreement, resulting from distribution of informational brochures and posters and an extensive communications effort. Subsequent polar bear harvests have remained within the allocated guidelines. Alaska Natives took 19 bears in 1990-1991 and 30 bears in 1991-1992, and Canadian hunters took 15 and 32 bears, respectively, during the two harvest years.

As noted earlier, a second polar bear population, the western or Bering/Chukchi Seas population, occurs in Alaska and has traditionally been used by Native peoples of both Alaska and Chukotka, Russia. In its 28 June letter forwarding the draft polar bear conservation plan, the Commission identified the possible need for a cooperative program between the United States and Russia to manage the take of polar bears from the Bering/Chukchi Seas population. By letter of 9 November 1992 the regional director of the Fish and Wildlife Service's Alaska Region advised the Commission that on behalf of the United States he had signed a protocol with the Russian Ministry of Ecology and Natural Resources on 22 October 1992. The intent of the protocol is to develop a management agreement for polar bears in the Bering and Chukchi Seas region.

The protocol recognizes the unique role of the Bering/Chukchi Seas polar bear population in the lives of indigenous Native peoples of Alaska and Chukotka, in preserving and developing traditional ways of life, and in maintaining the "ecological security" of those regions. It specifies that the agreement to be developed should place priority on cooperative efforts, such as exchanging ecological information on the status of the Bering and Chukchi Seas polar bear population with particular emphasis on evaluating population abundance and regulation of its use; cooperating with international and Native organizations whose activities are connected with the study and conservation of polar bears; bio-monitoring using coordinated methodologies; joint field research; coordinating polar bear conservation and management activities; and exchanging information on environmental legislation.

The protocol calls on both Governments to create special working groups composed of representatives of both government agencies and Native peoples to prepare proposals for such an agreement, and to convene a meeting of working groups in Russia in 1993 to prepare a draft agreement.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, is review-

ing the protocol, and early in 1993 it anticipates advising both the Fish and Wildlife Service and the Department of State of actions needed to develop cooperative polar bear conservation programs with both Russia and Canada.

Oil and Gas Exploration and Development

The increasing level of human activity in the Arctic, particularly those activities related to oil and gas exploration and development, poses risks to polar bears and other wildlife. As noted earlier, in January 1989 the Marine Mammal Commission held a workshop to determine ways to assess and minimize the possible adverse effects of oil and gas exploration and development on polar bears. In its 28 December 1990 letter forwarding the workshop report to the Fish and Wildlife Service, the Commission recommended, among other things, that the Service work with the Minerals Management Service and the corresponding State agency to identify and agree upon information that should be contained in site-specific polar bear interaction plans, as well as procedures that should be used to review and approve such plans.

On 11 June 1991, the Fish and Wildlife Service responded to the Commission's 28 December 1990 letter. The Service noted that it anticipated developing regulations to give effect to section 101(a)(5) of the Marine Mammal Protection Act (see Chapter VIII). It expected that they would specify development and approval of site-specific interaction plans as one of the requirements for obtaining letters of authorization allowing the take of polar bears incidental to oil and gas activities. The Service also noted that the oil and gas industry had been very cooperative in responding to recommendations about development and implementation of polar bear interaction plans.

Following distribution of the workshop report, the Minerals Management Service contracted for the development of guidelines for outer continental shelf (OCS) operations in polar bear habitats. The study is designed to produce a handbook on design, layout, and operation of offshore industrial sites to minimize human/polar bear interactions. The handbook will include recommendations for responding to human encounters with polar bears. As of the end of 1992, it was anticipated that the handbook would be available in March 1993.

As part of its Fiscal Year 1993 Environmental Studies Plan, the Minerals Management Service proposed to fund a study of the association of previously tagged polar bears with offshore drilling and production sites in the Arctic and the effectiveness of detection and deterrent devices. However, because of funding restraints, the study will not be funded during Fiscal Year 1993.

Also, by *Federal Register* notice of 30 December 1992, the Fish and Wildlife Service published proposed regulations to authorize the take of small numbers of polar bears and walruses incidental to oil and gas operations in the Beaufort Sea. For further discussion, see Chapter VIII.

At the end of 1992, the Commission was considering the issues described above to decide what additional actions may be needed to conserve polar bears and their habitat in Alaska and to ensure that the United States is meeting its obligations under the Agreement on Conservation of Polar Bears.

Chapter IV

MARINE MAMMAL–FISHERIES INTERACTIONS

Marine mammals may interact with fisheries in a number of ways. They may be disturbed, harassed, injured, or killed either accidentally or deliberately during fishing operations; they may take or damage bait and fish caught on lines, in traps, and in nets; they may damage or destroy fishing gear or injure fishermen while trying to remove bait or caught fish or when they accidentally become entangled in fishing gear; and they may compete with commercial and recreational fishermen for the same fish and shellfish resources.

The Marine Mammal Protection Act directs the Secretaries of Commerce and the Interior, in consultation with the Marine Mammal Commission, to develop regulations governing the incidental taking of marine mammals by persons subject to the jurisdiction of the United States. In 1988 the Marine Mammal Protection Act was amended to establish a five-year interim exemption to govern the taking of marine mammals incidental to commercial fisheries other than the eastern tropical Pacific tuna fishery. The interim exemption was designed to allow commercial fisheries to operate while information is collected on the extent and effects of marine mammal-fisheries interactions.

With respect to the eastern tropical Pacific tuna fishery, incidental taking of marine mammals continues to be regulated under a general permit issued in 1980 to the American Tunaboat Association. That permit, however, will expire on 1 March 1994 if any major tuna fishing nation formally commits to a global moratorium on the practice of catching tuna by setting on marine mammals. If no major tuna fishing nation commits to the moratorium, the general permit will expire on 31 December 1999.

The 1988 Marine Mammal Protection Act amendments also direct the Secretary of Commerce, based upon recommended guidelines provided by the Marine Mammal Commission, to submit to Congress a suggested new regime to govern incidental taking of marine mammals in fisheries other than the tuna purse seine fishery after the interim exemption expires on 1 October 1993.

Actions taken in 1992 to address these matters are discussed below. Also discussed are recent efforts to assess possible changes in the structure of the Bering Sea and Gulf of Alaska ecosystems. Fishery interactions affecting Hawaiian monk seals, Steller sea lions, killer whales, vaquitas, and sea otters are discussed in Chapter III. Activities concerning high seas driftnet fisheries, which pose serious threats to marine mammals and many other marine species, have been subject to international negotiations and are discussed in Chapter V.

Interim Exemption for Commercial Fisheries

Subject to certain exceptions, the Marine Mammal Protection Act established a moratorium on the taking and importing of marine mammals. Recognizing that a total prohibition of taking could seriously affect certain fisheries, the Act, as passed in 1972, authorized the Secretaries of Commerce and the Interior to issue general permits through formal rulemaking to allow the taking of marine mammals incidental to commercial fishing operations when such taking would not disadvantage the affected marine mammal species or stocks. The Act was amended in 1981 to streamline procedures for authorizing the accidental, but not intentional, taking of small numbers of non--depleted marine mammal species and stocks during commercial fishing operations if, after notice and opportunity for public comment, the Secretary finds that the total of such taking would have a negligible impact on the affected species or stocks.

In May 1987 the Department of Commerce issued a general permit to the Federation of Japan Salmon Fisheries Cooperative Association authorizing the take of Dall's porpoises (*Phocoenoides dalli*) in the Japanese North Pacific salmon driftnet fishery. The permit was challenged in a lawsuit filed by the Kokechik Fishermen's Association, representing Alaska subsistence fishermen, and several environmental groups. As a result of *Kokechik Fishermen's Association* v. *Secretary of Commerce*, the permit was ruled invalid. The court found that issuing the single-species permit violated the Marine Mammal Protection Act because other species for which a permit could not be issued (*e.g.*, northern fur seals) would inevitably be caught if the Japanese were allowed to fish as authorized by the permit.

The court's decision overturned a longstanding National Marine Fisheries Service interpretation of the Marine Mammal Protection Act permit provisions and cast serious doubt on the Service's ability to issue incidental-take permits for other fisheries, including several domestic fisheries whose permits were to expire at the end of 1988. For some fisheries, there was insufficient information to determine which marine mammal species were likely to be taken incidentally. In other cases it appeared likely that there were insufficient data to make the required showing that affected marine mammal species and population stocks were within their optimum sustainable population range and would not be disadvantaged (*i.e.*, be reduced below their maximum net productivity level) as a result of the incidental taking. In addition, small numbers of depleted species for which incidental-take permits could not be issued were known to be taken incidental to some fisheries.

1988 Amendments to the Marine Mammal Protection Act

In response to uncertainties raised by the *Kokechik* decision, representatives of the fishing industry and environmental community jointly proposed that Congress exempt U.S. fishermen from the general permit and "small-take" provisions of the Marine Mammal Protection Act for three years to allow the take of marine mammals incidental to certain commercial fisheries while gathering information needed to make the required determinations. Based largely on that proposal, the Marine Mammal Protection Act was amended in 1988 to provide a limited five-year exemption from the Act's taking prohibition for most commercial fisheries. During the exemption period, which runs until 1 October 1993, the general permit and small-take provisions of the Act do not apply. Rather, incidental taking is authorized and regulated in accordance with the exemption provisions of new section 114. Foreign fisheries not regulated under the Magnuson Fishery Conservation and Management Act, such as the Japanese high seas salmon fishery at issue in the *Kokechik* case, are not included in the exemption. An exception was also made for the yellowfin tuna purse seine fishery, which continues to operate under a general permit issued to the American Tunaboat Association in 1980. The purpose of the exemption program is to enable commercial fisheries to continue to operate while information essential for long-term management of marine mammal-fisheries interactions is gathered.

Under the exemption provisions, owners of vessels operating in fisheries identified by the National Marine Fisheries Service as frequently or occasionally taking marine mammals must register with the Service and obtain an exemption certificate. Vessel owners, masters, and crew members are not subject to penalties under the Marine Mammal Protection Act for the incidental take of marine mammals, except for the take of California sea otters or the intentional lethal take of cetaceans or marine mammals from depleted populations, if the owners maintain a current exemption. Unauthorized taking of endangered or threatened marine mammals continues to be a violation of the Endangered Species Act. In addition, if the incidental taking is having an immediate and significant adverse impact on a marine mammal stock or if more than 1,350 Steller sea lions or 50 northern fur seals will be killed during a calendar year, the Service, in consultation with the appropriate regional fishery management councils and state agencies, must prescribe emergency regulations to prevent, to the extent practicable, any further taking.

In order for an exemption to remain valid, the vessel owner must submit a report detailing any instances of incidental taking and providing other information prescribed by the National Marine Fisher-

ies Service. In addition, owners of vessels engaged in fisheries that frequently take marine mammals must, if requested, accept the placement of natural resource observers on board their vessels or face revocation of their exemptions and imposition of a $5,000 fine.

Fishermen engaged in fisheries determined to have only a remote possibility of taking marine mammals need not register with the Service or obtain an exemption certificate. However, they must report all marine mammal mortalities incidental to their operations within 10 days of returning to port to avoid being liable for penalties.

The 1988 amendments required the National Marine Fisheries Service, after opportunity for public comment, to publish a list of all U.S. fisheries, classifying them as Category I (those with frequent incidental takes), Category II (those with occasional incidental takes), or Category III (those with either a remote possibility of or no known incidental takes). Other Service responsibilities included establishing an observer program under which 20 to 35 percent of the operations by Category I vessels would be monitored; creating an alternative observer program if less than 20 percent of the operations in a Category I fishery would be observed; implementing an information management system capable of processing and analyzing observer data and reports required from vessel owners engaged in Category I and Category II fisheries; and consulting with the Fish and Wildlife Service before taking actions or making determinations involving marine mammal species under jurisdiction of the Department of the Interior.

As noted above, the interim exemption is intended to govern marine mammal-fisheries interactions for five years. It is expected that before the interim exemption expires, Congress will reexamine the issue in light of information gathered under the exemption program and enact a new system for regulating incidental taking. Efforts to develop a regime to govern the take of marine mammals incidental to commercial fishing operations after 1 October 1993 are discussed below.

Implementation of the Interim Exemption

To implement the interim exemption for commercial fisheries, the National Marine Fisheries Service issued a series of regulations during 1989. Development of those regulations and other actions taken by the National Marine Fisheries Service and others during 1989, 1990, and 1991 to implement the interim exemption for commercial fisheries are discussed in previous annual reports.

One of the responsibilities of the Service is to update, at least annually, the list of fisheries. The initial list of fisheries was published by the Service on 20 April 1989. Each fishery was placed in one of three categories depending on the frequency with which marine mammals are taken. Since then the Service has revised the list several times based on observer data and other available information.

The Service's proposed changes to the list of fisheries for 1992 were published in the 16 January 1992 *Federal Register*. Among other things, the Service proposed to recategorize the following fisheries: the Bering Sea and Aleutian Islands groundfish trawl fishery from Category I to Category III; the Prince William Sound salmon driftnet fishery from Category I to Category II; the California setnet fishery for soupfin shark, yellowtail, and white sea bass from Category II to Category I; the southern New England and mid-Atlantic squid trawl fishery from Category II to Category III; and the mid-Atlantic coastal shad and sturgeon gillnet fishery from Category III to Category II.

By letter of 2 March 1992 the Marine Mammal Commission commented on the proposed changes to the list of fisheries. The Commission noted that under the Service's regulations the final list of fisheries for 1992 should have been published on or about 1 October 1991. The Commission therefore recommended that the Service review its procedures for updating the list of fisheries and implement whatever changes are necessary to meet the regulatory schedule. The Commission also recommended that the Service provide it and other interested parties with periodic summaries of the data collected under the interim exemption program, to enable reviewers to provide informed comments on the annual lists of fisheries.

The Commission noted that in some cases, particularly for those fisheries where observer coverage has been low or where the inter-annual variation in incidental take levels may be high, the Service appeared to be proposing changes to the list of fisheries based upon very limited information. The Commission therefore recommended that the Service proceed cautiously when revising the list and assess the likelihood that available data accurately represent the likely average or long-term take level for a particular fishery. The Commission also noted that some fisheries may take marine mammals infrequently in individual fishing operations, yet because a large number of operations are conducted, they may cumulatively have significant adverse effects on marine mammal populations. In light of this concern, the Commission recommended that two such fisheries, the shrimp trawl and menhaden purse seine fisheries off the South Atlantic and Gulf states, be upgraded from Category III to Category II to enable the Service to obtain more reliable information on fishing effort and incidental take rates. The Commission cautioned that, unless better information on these fisheries is developed, it could be difficult to justify authorizing any take incidental to these fisheries under the new management regime being developed to govern marine mammal-fisheries interactions after 1 October 1993.

The Service published its final list of fisheries for 1992 on 12 May 1992. The Service determined that the 1991 observer data for the Prince William Sound salmon driftnet fishery did not support the proposed downlisting of the fishery. As such, the fishery was retained in Category I. The other proposed fishery reclassifications noted above were all adopted in the final list. The Commission's recommendation that the shrimp trawl fishery and the menhaden purse seine fishery be moved to Category II was not adopted.

By *Federal Register* notice of 5 August 1992 the National Marine Fisheries Service proposed no changes to the list of fisheries for the 1993 fishing season. The Commission provided comments to the Service on 2 September 1992. The Commission noted that, inasmuch as the Service had not provided it with requested data obtained under the interim exemption program, it had "no basis for determining whether such a proposal is appropriate or whether additional changes...may be warranted." Subsequently, the Service provided the Commission with a summary of the incidental take data obtained under the interim exemption's observer and reporting programs. Those data supported the Service's determination that further changes to the list of fisheries were not needed. However, by letter of 8 December 1992 the Service provided the Commission with additional information indicating that a reclassification of the pair trawl fishery for swordfish, tuna, and shark from Category II to Category I might be appropriate. At the end of 1992, the Commission was reviewing that information and planned to provide comments early in 1993.

Under the interim exemption, all vessels participating in Category I or Category II fisheries must register with the National Marine Fisheries Service and obtain an exemption certificate. At the end of 1989, approximately 10,400 vessel owners had registered for and had been issued exemption certificates. Exemption certificates were renewed automatically by the Service in 1990, and by the end of that year, nearly 16,000 vessels participating in Category I or Category II fisheries had registered and had obtained exemption certificates. Exemption certificates were renewed in 1991 and 1992 only if the required reports had been received by the National Marine Fisheries Service. During 1991, 12,194 vessels were registered as participating in Category I and/or Category II fisheries. In 1992, the number of registered vessels dropped to 11,223. It is unknown whether the decline in registration reflects a decline in the number of vessels engaged in Category I and II fisheries or an increase in the number of vessels participating in those fisheries without registering for an exemption.

Fishermen operating in Category I and Category II fisheries must maintain accurate daily logs of fishing effort, including gear type and target species; the number, species, and location of marine mammals taken; type of marine mammal interaction (*e.g.*, disturbance, injury, or mortality); any intentional takes and the methods used to deter marine mammals from gear or catch; and any loss of fish or gear caused by marine mammals. By the end of each year, an annual report, including a copy of the required logs, must be submitted to the Service. Category III fishermen are not required to submit annual reports, but must report all lethal incidental taking of marine

mammals to the Service within 10 days after returning from the trip during which the taking occurred.

Regulations setting forth the reporting requirements under the interim exemption did not become effective until 16 January 1990. Even though the reporting regulations had yet to enter into force, some 3,500 annual reports for 1989 were voluntarily submitted, based upon the requirements set out in an earlier published proposed rule. For 1990, the first year of mandatory reporting, just over 12,000 reports were filed. That is, about three-fourths of the vessels required to submit reports did so. Almost 85 percent of the registered vessels required to submit reports for 1991 have done so, with 10,360 reports having been received.

For 1990, vessels reported over 260,000 marine mammal interactions with fishing gear, harassment of 76,000 marine mammals to deter them from taking catch or harming gear, 1,400 marine mammal injuries, and over 2,200 marine mammal deaths. Reports for 1991 indicate nearly 200,000 incidents of marine mammals interacting with fishing gear, deterrence by fishermen of about 51,000 marine mammals, injuries to 623 marine mammals, and 1,340 deaths. Data from vessel reports and the observer program indicate that most fishery-related marine mammal mortality occurs in gillnet fisheries. While vessel reports indicate a large number of marine mammal-fisheries interactions, many may have been very minor, and in some cases may constitute nothing more than observations of marine mammals in the vicinity of fishing operations. Figures on the number of reports filed by Category I and Category II fishermen for 1992 and on the reported level of incidental take are not yet available.

Extrapolations based on data from the observer program suggest that fishermen's reports may underestimate marine mammal mortality occurring in at least some Category I fisheries, sometimes by considerable amounts. For some fisheries with relatively high observer coverage, the number of mortalities actually observed exceeded the number of mortalities reported by the fishery as a whole.

As discussed above, the 1988 amendments required establishment of an observer program to monitor between 20 and 35 percent of the fishing operations conducted by Category I vessels. Early in 1989, however, it became apparent that funding levels would be insufficient even for minimal (20 percent) coverage of all designated Category I fisheries. In response, the National Marine Fisheries Service established criteria for setting priorities for placing observers in Category I fisheries based upon (1) whether depleted species are taken; (2) the population trends of the species taken in the fishery; (3) the annual take rate of marine mammals, expressed in terms of population percentage; and (4) whether marine mammals for which a quota has been established (*i.e.*, Steller sea lions and northern fur seals) are taken. The Service also decided that, rather than providing straight 20 percent coverage in the top priority fisheries until funds were exhausted, it would consider reduced coverage in some fisheries if reliable estimates of incidental taking could be made from less than 20 percent coverage.

Of the ten fisheries placed in Category I during 1991, observer coverage in only three exceeded 20 percent. Observer coverage of the other Category I fisheries ranged between 5 and 10 percent. Observer coverage levels for 1992 are not yet available.

Development of a New Regime To Govern the Incidental Take of Marine Mammals after October 1993

The interim exemption for commercial fisheries was enacted in 1988 to govern marine mammal-fisheries interactions for a five-year period. At the end of the five-year period, it is expected that the interim exemption will be replaced by a new regime with a firm scientific rationale for setting take limits based on sound principles of wildlife management. Congress is expected to begin consideration of the new incidental take regime during the first half of 1993.

The Commission's Recommended Guidelines

As a first step in developing the new regulatory regime, the Marine Mammal Commission was directed by the 1988 Marine Mammal Protection Act

amendments to make available to the Secretary of Commerce and to the public recommended guidelines to govern the take of marine mammals incidental to commercial fishing operations after the interim exemption expires on 1 October 1993. The amendments required that the guidelines:

"(A) be designed to provide a scientific rationale and basis for determining how many marine mammals may be incidentally taken under a regime to be adopted to govern such taking after October 1, 1993;

"(B) be based on sound principles of wildlife management, and be consistent with and in furtherance of the purposes and policies set forth in this Act; and

"(C) to the maximum extent practicable, include as factors to be considered and utilized in determining permissible levels of such taking —

(i) the status and trends of the affected marine mammal population stocks;

(ii) the abundance and annual net recruitment of such stocks;

(iii) the level of confidence in the knowledge of the affected stocks; and

(iv) the extent to which incidental taking will likely cause or contribute to their decline or prevent their recovery to optimum sustainable population levels."

On 12 July 1990 after consideration of comments received on draft guidelines, the Commission transmitted its recommended guidelines to the National Marine Fisheries Service. Copies of the guidelines were also provided to other interested parties, including commercial fishing organizations and environmental groups. In addition to the recommended guidelines, the Commission prepared and provided to the Service and others a document summarizing all substantive comments it received on the draft guidelines, explaining how they were addressed.

The Commission, in its guidelines, recommended that the legislation to govern the taking of marine mammals incidental to commercial fishing after 1 October 1993 do the following:

- re-affirm the Marine Mammal Protection Act's goal to reduce the incidental kill and serious injury of marine mammals in the course of commercial fishing to insignificant levels approaching a zero mortality and serious injury rate;

- reinstate the substantive, although not necessarily the procedural, requirements of the general permit and small-take provisions of the Marine Mammal Protection Act for marine mammal populations known or reasonably believed to be at their optimum sustainable population levels;

- allow the incidental take of marine mammals listed as endangered or threatened under the Endangered Species Act or designated as depleted under the Marine Mammal Protection Act when: (1) a recovery plan or conservation plan, including an implementation plan, has been developed, adopted, and put in place; (2) the authorized level of take, by itself and in combination with other sources of mortality, is not likely to cause or contribute to a further population decline or cause more than a 10 percent increase in the estimated time it will take for the affected species or population to recover to its maximum net productivity level; (3) ongoing and planned monitoring and enforcement programs are adequate to ensure that the authorized levels of take are not exceeded and to detect any unforeseen effects on the size or productivity of the affected species or population; and (4) there is good reason to believe that the incidental take has been or will be reduced to as near zero as practicable;

- authorize, on an experimental basis, for periods of three to five years, the incidental take from species and population stocks whose status is uncertain when: (1) the authorized level of incidental take clearly would have a negligible effect on population size and productivity; and (2) ongoing or planned assessment, monitoring, and enforcement programs are adequate to ensure that the authorized level of take will not be exceeded, the status of the affected species or population stock will be deter-

mined with reasonable certainty within three to five years, and possible ways to avoid or reduce the level of incidental take will be identified and implemented;

- streamline and continue the vessel registration and reporting programs initiated under the 1988 Marine Mammal Protection Act amendments;
- grant explicit authority to the Secretary of Commerce to place observers aboard any commercial fishing vessel operating in U.S. waters; and
- provide necessary funding or authorize the collection of user fees sufficient for observer and other marine mammal monitoring programs.

The Commission noted that one assumption behind the establishment of the interim exemption was that, at the end of the five-year period, sufficient information would be available on (1) the status of marine mammal stocks taken incidental to commercial fisheries, and (2) the impact of fisheries on those stocks, to enable the Secretaries of Commerce and the Interior to authorize specific levels of take based upon sound principles of wildlife management. In developing its recommended guidelines, the Commission accepted that assumption. However, based on comments received on the draft guidelines, the Commission indicated that it was unlikely, unless additional population assessments were undertaken promptly by the National Marine Fisheries Service, that the information needed to make required status determinations for many marine mammal stocks would not be available by 1993. To address this problem, the Commission recommended in the guidelines that the Service hold a workshop or series of workshops by early 1991 to (1) review available information on the status of marine mammal stocks and the effects of fisheries and other activities on those stocks; (2) identify what additional information, if any, would be needed to make status-of-stocks and other determinations required to authorize the incidental take of marine mammals by fisheries in U.S. waters after 1 October 1993; and (3) describe the research programs necessary to obtain and analyze that information.

The recommended guidelines also noted that marine mammals may be affected indirectly as well as directly by commercial fisheries (see, for example, the Steller sea lion discussion in Chapter III). To minimize adverse indirect effects, the Commission recommended that the Service promulgate regulations under the Fishery Conservation and Management Act requiring Fishery Management Councils to assess and take into account the food requirements (and uncertainties related thereto) of marine mammals and other non-target species when calculating the optimal yield of fishery resources. Towards this end the Commission recommended that the Service organize and hold a workshop or series of workshops in 1991 or 1992 to identify and evaluate possible procedures for assessing interactions and ensuring that fisheries do not directly or indirectly disadvantage marine mammal populations. The Commission suggested, among other things, that the workshop(s) should consider the establishment of thresholds below which exploitation of fish stocks should be prohibited; guidelines and procedures for addressing uncertainty with respect to the status of and functional relationships among fisheries resources and other components of the ecosystems; and research and management programs needed to fill critical gaps in our knowledge of the structure and dynamics of marine ecosystems.

The National Marine Fisheries Service's Initial Draft Regime

The 1988 amendments to the Marine Mammal Protection Act directed the Secretary of Commerce, after consultation with the Marine Mammal Commission, Regional Fishery Management Councils, and other interested agencies and organizations, to publish by 1 February 1991, for public review and comment, a suggested regime to govern incidental taking after 1 October 1993. The amendments mandated that the regime include scientifically sound guidelines to be used in determining permissible levels of incidental taking, a description of the arrangements for consultations with other agencies and interested parties, and a description of the regulations and legislation necessary to implement the suggested regime. After consultation with the Commission and consideration of public comment on the proposed regime, the Secretary was to provide to Congress by 1 January 1992 the suggested regime, recommendations for legislation to

implement the regime, and a proposed schedule for implementation.

The National Marine Fisheries Service's initial draft regime was published and distributed for comment on 24 May 1991. In most respects, the Service's initial proposal closely followed the guidelines recommended by the Commission. The primary difference was the addition of a general procedure for estimating the number of marine mammals that could be allowed to be removed from a population without causing it to be reduced or maintained below its maximum net productivity level — the lower limit of the optimum sustainable population range. This number was termed the "allowable biological removal" level. The total annual removal of animals from a population from all sources could not exceed the estimated allowable biological removal level. Allowable biological removal levels would be calculated for each marine mammal stock by multiplying the estimated minimum abundance of the stock by the best estimate of the stock's maximum annual net productivity rate and by a recovery factor, which would vary depending on the status of the stock relative to its carrying capacity. Default values for maximum net productivity rates of six percent for pinnipeds and sea otters and two percent for cetaceans and manatees would be used when specific information on net productivity rates is unavailable. Recovery factors would depend upon a qualitative estimate of a stock's status and would be 0.9 for stocks believed to be above two-thirds of their carrying capacity level (*i.e.*, for stocks within their optimum sustainable population range), 0.5 for stocks between one-third and two-thirds of carrying capacity (moderately depleted stocks), and 0.1 for stocks below one-third of carrying capacity (severely depleted stocks) or for which information necessary to make a status determination is unavailable.

The allowable biological removal level calculated for each stock would be allocated annually by the Service among the various user groups. The Service proposed to give priority to those takes that it could not control, such as subsistence harvests of non-depleted marine mammals, collisions with ships, and incidental takes by foreign fisheries outside the U.S. Exclusive Economic Zone. All or part of the remaining allowable biological removal would be allocated to "controllable" activities such as commercial fishing, public display, and scientific research. Allocations would be based on an assessment of need, economic impacts, historic take levels, and the ability of the user group to reduce its level of take.

By letter of 23 September 1991 the Marine Mammal Commission provided the Service detailed comments on the initial draft regime. The Commission noted that most parts of the draft regime were conceptually sound, but that in some cases, the regime was not explained in sufficient detail to allow critical evaluation. In this regard, the Commission noted that placing stocks in the three categories for applying recovery factors constituted *de facto* status of stocks determinations. The Commission therefore recommended that the Service base these determinations on clearly articulated criteria and use procedures that afford an opportunity for full scrutiny of the evidence before the agency, provide for independent review of the data, and require a complete explanation of the rationale for the determinations made.

The Commission also noted that it was not clear how the draft regime would deal with situations in which marine mammal carrying capacity has been reduced by overharvesting of prey species or other types of habitat degradation or destruction caused by commercial fisheries, coastal development, offshore oil and gas development, or other activities. In addition, while the Service's draft regime addressed mortalities and other removals of animals from wild populations, it did not indicate how noise disturbance and other forms of harassment, which also may result in decreased survival and productivity, would be considered.

The Commission also noted that the proposed formula for calculating allowable biological removal levels would not always yield conservative estimates as asserted. For example, the Service proposed to calculate the allowable biological removal level using the "best estimate of the stock's net production rate at the population level where net productivity is maximized" even when the population is known to be declining or the actual growth rate is known to be less than the estimated maximum growth rate and when there is uncertainty as to whether the decline or reduced growth rate is due to factors other than inci-

dental take by commercial fisheries. Also, the proposed regime failed to take into account that the biological significance of the removals will depend on the age and sex as well as the number of animals taken.

The initial draft regime would have allowed the Service to authorize incidental take for indefinite periods of time even when there were substantial uncertainties concerning the possible adverse effects of the take on the affected marine mammal stocks. In this context, the Commission pointed out that the proposed monitoring programs probably would be unable to detect population declines as great as five to ten percent per year in less than 10 to 20 years (*i.e.*, until the affected populations had been reduced by 50 percent or more). The Commission therefore recommended that the length of time that incidental takes could be authorized without making formal status-of-stocks determinations or verifying that affected populations are increasing toward (or being maintained within) their optimum sustainable population ranges be limited to three to five years. Without such a limit, there would be little incentive to ensure that incidental take during commercial fishing operations, by itself and in combination with other forms of take, does not cause the affected populations to be reduced or to be maintained below their maximum net productivity levels.

Under the Service's draft regime, recovery plans and conservation plans could establish allowable removal levels less than those calculated using the general formula for calculating allowable biological removals. The regime, however, did not identify those situations when such reductions would be appropriate or provide any criteria for making the determinations. Noting that such determinations were likely to be highly controversial and could impede necessary conservation measures, the Commission recommended that the Service expand its proposal to provide criteria for judging when it would be appropriate for recovery plans and conservation plans to establish take levels less than would be authorized using the general formula for calculating allowable biological removal levels.

The Draft Legislative Environmental Impact Statement that accompanied the Service's initial proposal assessed the economic impacts of four alternatives using the period before enactment of the Marine Mammal Protection Act as a baseline. This incorrectly implied that adoption of any of the alternatives would adversely affect fisheries and benefit marine mammals. The Commission pointed out that, without additional legislation, the system for authorizing the take of marine mammals incidental to commercial fisheries would revert to that in existence prior to enactment of the interim exemption in 1988. The Commission therefore recommended that the economic analyses be redone using the statutory provisions in effect prior to enactment of the interim exemption as the baseline. Such analyses would show that three of the four alternatives, including the Service's proposal and the Commission's recommended guidelines, would benefit fisheries to various degrees, at the expense of marine mammals.

In addition, the Commission recommended that:

- the term "allowable biological removal" be changed to clarify that it represents the maximum number of animals that might be taken from a population with confidence that the removals would not cause the population to be reduced or to be maintained below its maximum net productivity level;

- the proposed regime be revised to include a streamlined procedure for authorizing "small takes" of marine mammals in fisheries that have few interactions similar to that for non-fisheries activities provided in section 101(a)(5) of the Marine Mammal Protection Act;

- the Service establish a threshold below which no incidental taking from severely depleted populations could be authorized unless it were reasonably demonstrated that the population is increasing at or near its maximum growth rate and the authorized level of take would not significantly reduce the recovery rate;

- the Service review its determinations concerning "uncontrollable" takes and revise its approach for allocating allowable biological removals so that each requested authorization would be judged on its own merits, taking into account (1) other forms

of taking; (2) measures that might be taken to reduce unnecessary taking and to allocate the allowable take equitably among foreign and U.S. fisheries and other users; and (3) the likelihood that ongoing or planned monitoring programs are adequate to ensure that the affected populations are increasing toward, or being maintained within, their optimum sustainable population ranges;

- the proposal be expanded to describe the program that would be undertaken to reduce marine mammal mortalities and injuries incidental to commercial fishing operations to as near zero as practicable; and

- the Service provide, as part of the proposal and Legislative Environmental Impact Statement, draft legislative language illustrating how the proposed regime might be translated into law and an estimate of the cost to implement the proposed regime.

The National Marine Fisheries Service's Revised Draft Regime

The National Marine Fisheries Service received a large number of comments on its initial draft regime. While comments were received on all aspects of the proposal, many commenters focused on two points, the complexity of the Service's proposal and its broad applicability. Several commenters believed that attention should be focused primarily on those fisheries with significant marine mammal incidental take problems. The Service considered the comments and, on 20 November 1991, made a revised draft regime available for public review.

In the revised draft, the Service replaced the term "allowable biological removal" with "potential biological removal" to clarify that it represented the total number of individuals that could potentially be removed from a population, not necessarily the number of removals that would be authorized. The Service also revised the recovery factors to be used in calculating potential biological removal levels in response to claims that the original recovery factors were unnecessarily conservative. The recovery factor for severely depleted stocks (those below one-third of carrying capacity) and those of unknown status was revised upward from 0.1 to 0.5 (in effect increasing the take that potentially could be allowed by 500 percent), and the factor for stocks between one-third and two-thirds of carrying capacity was revised from 0.5 to 0.75. Under the revised proposal, no recovery factor would be used for stocks determined to be above two-thirds of carrying capacity.

With respect to carrying capacity, the revised draft regime appeared to indicate that current, rather than historical, carrying capacity would be used as the upper limit of the optimum sustainable population range. The lower limit of the optimum sustainable population range, the maximum net productivity level, is proportional to the carrying capacity level. Thus, if carrying capacity has been reduced by overfishing, environmental pollution, or other forms of habitat degradation or destruction, an affected marine mammal stock could be reduced but still be judged not to be depleted until it is listed as endangered or threatened under the Endangered Species Act.

The Service also proposed a new and somewhat more complex method for classifying fisheries. Historical data would be used to determine which commercial fisheries interact with marine mammals and which do not. All vessels operating in fisheries identified as interacting with marine mammals would be required to register with the Service. Those fisheries would be further classified based on the status of the marine mammals taken and the total level of takes from all sources relative to the calculated potential biological removal. Class A fisheries would be those that interact with endangered, threatened, or depleted marine mammals or with marine mammal stocks with an estimated annual removal level (from all sources) which equals or exceeds the potential biological removal level. Class B would include those fisheries that do not interact with depleted marine mammals but that interact with stocks whose potential biological removal level, although not now exceeded by total annual removals, is expected to be exceeded within the next three to five years. Class C fisheries would be those that do not interact with marine mammals from depleted stocks or from stocks whose potential biological removal level is likely to be exceeded within the next five years.

Under the revised draft regime, only Class A fisheries would be subject to comprehensive monitoring on an annual basis. Only when the total fisheries removal was expected to exceed the portion of the potential biological removal level allocated to fisheries, however, would annual monitoring be required. Class B fisheries would, at the Service's discretion, be monitored every two to five years. Class C fisheries would be monitored every five to ten years, depending on the estimated level of incidental removals.

Fishery-specific quotas would be established only for Class A fisheries, and then only if the portion of the potential biological removal level allocated to fisheries would likely be exceeded. Removals in fisheries subject to quotas would be monitored sufficiently to enable the Service to implement restrictions on fishing activities if necessary to prevent the potential biological removal level from being exceeded.

Other major changes contained in the Service's revised draft regime included streamlining of the allocation process, requiring development of annual research plans to fill data gaps with respect to marine mammal stocks, recommending that the new regime be implemented under a "phased strategy" with a goal of reducing take to potential biological removal levels by the end of 1997.

The Commission provided comments on the Service's revised draft regime by letter of 20 December 1991. While the revised proposal responded to some of the comments and recommendations provided by the Commission and others on the original proposal, it failed to address others. Moreover, some of the modifications made the revised draft regime, in the Commission's view, "even less adequate" than the initial version. The Commission expressed its belief that the revised proposal could and should be improved and indicated a willingness to recommend that Congress postpone the deadline for transmitting the suggested regime to enable the identified deficiencies to be corrected.

The Commission noted that both the original and revised proposals were in some respects inconsistent with the Recommended Guidelines provided by the Commission and the fundamental purposes and policies of the Marine Mammal Protection Act. For example, the revised regime did not appear to recognize or consider situations in which marine mammal survival and productivity are being or may be reduced by habitat degradation or destruction, or by unusual disease outbreaks or natural catastrophes. It also appeared, as noted above, that the Service was proposing to use current carrying capacity as the basis for making status-of-stocks determinations without considering human-caused habitat degradation and destruction.

Many of the apparent deficiencies in the Service's revised draft regime may have been attributable to the lack of detail in the proposal. For example, it purported to retain the Act's zero mortality rate goal but neither described the programs needed to meet the goal nor estimated the cost of such programs, as had been recommended by the Commission previously. In addition, while the revised proposal indicated that recovery and conservation plans could establish removal levels more restrictive than the calculated potential biological removal level, it did not describe those situations in which it would be appropriate to do so. Also, it did not provide criteria for making such determinations, as the Commission had recommended. In light of these and other omissions, the Commission pointed out that it was impossible to assess the pros and cons of the revised proposal accurately.

To overcome the deficiencies the Commission recommended, among other things, that the National Marine Fisheries Service revise and expand the proposal to:

- include the specific statutory amendments and related report language that the Service would propose to establish the regime;

- prohibit taking from species or populations whose minimum estimated size is less than 3,000 individuals or 30 percent of the best available estimate of historic abundance, whichever is higher, unless it reasonably can be demonstrated that the population is increasing at its maximum potential rate and the authorized level of take will not cause a greater than ten percent increase in the estimated time it will take the population to reach its maximum net productivity level;

- take account of situations where either marine mammal survival or productivity has been or may be affected by habitat degradation or destruction;

- identify situations and propose criteria for deciding when recovery plans and conservation plans for endangered, threatened, and depleted species should be used to establish removal levels less than the level calculated using the general formula for estimating potential biological removal levels;

- revise the definitions of Class A, B, and C stocks to make it clear that the burden of proof will remain, as presently is the case under the Marine Mammal Protection Act, on potential users to demonstrate that levels of taking do not disadvantage the affected marine mammal species and stocks;

- describe the program or programs the Service is planning or proposing to move toward the zero mortality rate goal;

- provide an estimate of the funding and special logistic requirements that would be required to implement the proposed assessment, monitoring, and mortality reduction programs; and

- revise the assessments of possible economic impacts in the Legislative Environmental Impact Statement to use the Marine Mammal Protection Act prior to 1988, to which the interim exemption will revert without enactment of new legislation, as the baseline against which the environmental and economic impacts of the various alternatives are compared.

The National Marine Fisheries Service's Proposed Regime

After considering comments received on its draft proposals, the National Marine Fisheries Service completed and on 4 December 1992 transmitted to Congress its Proposed Regime to Govern Interactions Between Marine Mammals and Commercial Fishing Operations. The proposed regime retained the Marine Mammal Protection Act's goal of maintaining marine mammal stocks at optimum sustainable population levels and reaffirmed the goal of reducing marine mammal mortalities to insignificant levels approaching zero. Incidental taking of endangered, threatened, or depleted marine mammals, or from stocks of unknown status, could be authorized, but only in those instances when the taking would not prevent or significantly delay recovery of the stock to optimum levels. Taking of endangered and threatened species would have to be authorized under both the Marine Mammal Protection Act and the Endangered Species Act.

The proposal clarifies that, when making determinations with respect to optimum sustainable population levels, the Service will use current carrying capacity as adjusted to account for human-caused habitat degradation and destruction. Where such degradation of the marine environment has occurred, but is correctable, the estimated carrying capacity levels of affected marine mammal stocks would be increased accordingly.

As with the earlier proposal, a potential biological removal (PBR) level would be set for each marine mammal stock from which animals are taken incidental to commercial fishing. The potential biological removal level would be the maximum number of animals that could be removed from a stock by all sources. When data are sufficient to demonstrate that a stock is within its optimum range, that determination would form the basis for setting the potential removal level. The potential biological removal level for these stocks would be determined by multiplying the best estimate of minimum stock abundance by the per capita rate of increase in the population at its maximum net productivity level (R_{MNPL}). That is, the calculation would not include a 10 percent safety factor as had been included in the Service's initial draft proposal.

The Service retained the use of recovery factors for calculating potential biological removal levels for depleted stocks and stocks for which status determinations currently cannot be made. Application of the recovery factors, however, would be based on the legal status of a population, not necessarily its status relative to carrying capacity. The recovery factor for populations listed as endangered would be 0.1. For stocks that are threatened, depleted, or of unknown

status, the recovery factor would be 0.5. As noted above, no recovery factor would be used for populations determined to be at optimum sustainable levels.

The potential biological removal levels would be calculated by multiplying the product of the estimated minimum population size and the per capita rate of increase by the recovery factor. When reliable estimates of a stock's per capita rate of increase at its maximum net productivity level are not available, default values would be used. As in the initial draft regime, default values of R_{MNPL} would be 6 percent for pinnipeds and sea otters and 2 percent for cetaceans and manatees.

Potential biological removal levels for endangered, threatened, and depleted stocks may be further adjusted to ensure that recovery occurs without significant delay. Among other things, such adjustments could be made to conform to conservation or recovery plans for these species. While the Commission had recommended that no taking from an endangered, threatened, or depleted stock be allowed until a conservation or recovery plan was in place, the Service thought its proposal sufficiently conservative to make such a requirement unnecessary. Under the Service's proposed regime, takes from such stocks could be allowed on an interim basis for a 240-day period, during which time conservation or recovery plans would be developed.

As noted above, potential biological removal levels would be calculated using the best available estimates of minimum stock size. To gather this and other information necessary to calculate potential biological removal levels and to make status of stock determinations, the Service proposes to build on its stock assessment and research program. Priority would be given to those species listed as endangered or threatened and to declining populations. The Service would prepare draft stock assessment reports to be reviewed by independent peer review panels comprised of scientists from the Marine Mammal Commission, other Federal and state agencies, and academia. Representatives of the fishing industry and the environmental community would participate on the review panels in an advisory capacity. After review by the scientific panels, the stock assessment reports would be revised and made available for public review and comment before final adoption.

Marine mammal stocks would be classified according to their status and the level of take relative to the calculated potential biological removal level. A stock would classified as a Class Alpha (α) stock if it is endangered, threatened, or depleted, or if the total estimated removals from the stock, from all sources, equals or exceeds the estimated potential biological removal level. All other marine mammal stocks would be classified as Class Beta (β) stocks.

The Service's proposal identifies 64 marine mammal stocks that are or may be subject to taking incidental to commercial fishing. Of these, 12 are considered to be Class α stocks by virtue of being listed as endangered or threatened or designated as depleted. Preliminary data for 14 other stocks indicate that they would likely be Class α stocks because estimated removals would exceed the calculated potential biological removal levels. An additional 12 stocks would preliminarily be considered to be α stocks because there are insufficient data to make abundance estimates and to calculate potential biological removal levels. The remaining 26 stocks would be Class β stocks.

Each fishery would be classified on the basis of its marine mammal interactions. Fisheries that do not take marine mammals would not be included within the proposed regime.

A fishery having a significant impact on a Class α stock would be designated as a Category I fishery. A fishery which takes Class α marine mammals, but which does not have a significant impact on any Class α stock would be designated as a Category II fishery. Category II would also include those fisheries having significant impacts on Class β marine mammal stocks. Fisheries taking only Class β marine mammals at insignificant levels would be classified as Category III fisheries. Under the Service's proposal, the level of incidental take would be considered significant if it increases the time needed for recovery of an α stock by 10 percent or more or if removals exceed 0.5 percent of the minimum abundance estimate for a β stock. These criteria for determining whether the effects of incidental taking are significant are consis-

tent with recommendations made by the Commission on the earlier versions of the proposed regime.

Under the proposed regime, the potential biological removal level for each Class α stock would be allocated among user groups, including commercial fishermen and those taking marine mammals incidental to activities other than commercial fishing, such as public display, research, and subsistence hunting. In accordance with the Marine Mammal Protection Act's exemption for Alaska Natives, taking for subsistence and handicraft uses by Alaska Natives would be given priority. Allocations made to Alaska Natives would not be binding, but would be used to adjust the allocations for other user groups.

Prior to issuing proposed allocations the Service would complete environmental and socio-economic analyses. The Service also would review stock assessment reports and applicable conservation and recovery plans to determine whether biological factors, such as the need to restrict removals by season, area, age, sex, or reproductive class, should be factored into allocation determinations.

Proposed allocations for non-fishery groups would be published in the *Federal Register* for public review and comment. Proposed allocations for fisheries would be established in a manner similar to the allocation of fish quotas under the Magnuson Fishery Conservation and Management Act. The Service would propose preliminary allocations which would be provided to the Fishery Management Councils and state fishery agencies. The Councils and state agencies would hold hearings and solicit public comment on the proposed fishery allocations and provide recommendations to the Service.

Based on Council and state recommendations as well as other comments it receives, the Service would publish a final notice of all allocations, including those for fisheries and non-fisheries take. When issuing allocations the Service proposes to hold 10-20 percent of the potential biological removal in reserve to be allocated in emergency situations. Affected parties would have the right to seek judicial review of final allocation decisions.

Incidental taking would be monitored to ensure that allocations are not exceeded. Once a fishery takes the number of marine mammals allocated to it, additional removals from that stock by that fishery would be prohibited. The fishery would either have to modify or cease its operations.

Under the proposed regime the potential biological removal system would gradually be replaced by a system driven by mechanisms for reducing incidental take levels rather than by setting quotas. That is, the zero mortality goal of the Act would require that incidental taking be decreased even if the potential biological removal level is not exceeded.

All vessels operating in Category I, II, or III fisheries would be required to register annually with the Service and obtain a permit authorizing a certain level of take. Category I fisheries would be subject to comprehensive monitoring on an annual basis. Category II fisheries would also be subject to annual monitoring, but presumably at a lesser level. Category III fisheries would be subject to monitoring every 2-3 years or as needed to ensure that they do not merit reclassification as Category I or II fisheries.

Intentional taking of marine mammals incidental to commercial fishing using non-lethal means would be authorized only to ensure personal safety or to protect gear or catch. Intentional lethal taking would be authorized only to ensure personal safety or to relieve a demonstrated negative impact on a fishery. No intentional taking of marine mammals from endangered, threatened, or depleted stocks would be authorized.

If adopted, the Service's proposal would be implemented according to a "phased strategy." While removals from certain marine mammal stocks would be allowed to exceed the potential biological removal levels in the initial years of the program, removal reduction schedules would be adopted with the goal of reaching those levels no later than 31 December 1997.

While hearings have yet to be scheduled, it is expected that Congress will consider the adoption of a new regime to govern the taking of marine mammals incidental to commercial fishing operation during its 1993 session.

The Tuna-Dolphin Issue

For reasons not fully understood, schools of large yellowfin tuna (those greater than 25 kilograms) tend to associate with dolphin schools in the eastern tropical Pacific Ocean, an area of more than five million square miles stretching from southern California to Chile and westward to Hawaii. In the late 1950s U.S. fishermen began to exploit this association by deploying large purse seine nets around the more readily observed dolphin schools to catch the tuna swimming below. Despite efforts by the fishermen to release the encircled dolphins, some become trapped in the nets and drown. As discussed below, efforts to reduce the incidental mortality of dolphins in this fishery have been a central focus of the Marine Mammal Protection Act since it was enacted in 1972.

Background

At its peak in the mid-1970s a U.S. fleet of more than 150 vessels accounted for nearly 70 percent of the fishing capacity in the eastern tropical Pacific tuna fishery. In the late 1970s and early 1980s, the U.S. fleet declined and the number of foreign vessels participating in the fishery grew. As discussed in previous annual reports, by 1990 only 30 U.S. tuna vessels remained in the fishery, accounting for less than one-third of the total fleet capacity.

On 12 April 1990 the three largest U.S. tuna canners announced that they would no longer purchase tuna caught in association with dolphins. In response, there has been a further decline in U.S. purse seine vessels fishing in the eastern tropical Pacific. During 1992 only seven U.S. vessels fished for tuna in the eastern tropical Pacific, and of these only five fished for tuna by setting on dolphins.

Despite the decline of the U.S. tuna purse seine fleet, the United States remains an important market for tuna caught in the eastern tropical Pacific. Prior to the announcement by U.S. canners of their "dolphin-safe" purchasing policy, about 44 percent of tuna caught in the eastern tropical Pacific was sold in the United States, about 30 percent in Latin America, about 20 percent in western Europe, and about 5 percent in Asia. Although the full extent of any market shift that may have resulted from the "dolphin-safe" policy of U.S. canners is unknown, it is believed that the U.S. market for eastern tropical Pacific tuna has declined since April 1990.

The decline of the U.S. fleet in the 1970s and 1980s has been offset in large part by growth of foreign fleets in the area. The Mexican fleet increased by nearly 50 percent during the 1980s and displaced the U.S. fleet as the primary participant in the fishery. The Venezuelan fleet more than tripled in size during the 1980s and now has about 20 vessels participating in the fishery. The other major participants in the eastern tropical Pacific tuna fishery are Vanuatu and Ecuador. Ecuador's vessels, however, currently do not fish for tuna by setting on dolphins.

A parallel shift also has occurred in the tuna canning industry. During the early years of the fishery, most of the tuna canning industry was operated by U.S. companies. In the 1960s, 12 tuna canneries were in operation in southern California, others were located on both coasts of the United States, two were operating in American Samoa, and two in Puerto Rico. Today only two canneries, both in southern California, remain in operation in the United States. Three canneries are operating in Puerto Rico, and two in American Samoa. The country with the most dramatic increase in canned tuna production during the past decade is Thailand, which began canning tuna in the early 1980s and now is one of the world's largest producers. Other nations that substantially increased canned tuna production during the 1980s are Italy, France, Mexico, the Philippines, and Côte d'Ivoire. More recently, there has been considerable growth in Indonesia's tuna canning industry.

As the eastern tropical Pacific tuna fishery shifted to foreign control, so did the incidental dolphin mortality. Recognizing this, Congress amended the Marine Mammal Protection Act in 1984 to require that foreign nations exporting yellowfin tuna to the United States adopt dolphin-saving programs equivalent to the U.S. program and achieve an incidental mortality rate comparable to that of the U.S. fleet. The Act was further amended in 1988 to specify what would constitute an acceptable foreign program and a comparable mortality rate. Recent efforts, including

enactment of the International Dolphin Conservation Act of 1992, have focused on ways to eliminate rather than merely reduce incidental dolphin mortality.

The 1992 Tuna Fishing Season

In 1980 the National Marine Fisheries Service promulgated final regulations establishing annual quotas for individual dolphin stocks and a total annual allowable take for U.S. fishermen of 20,500 dolphins for the years 1981-1985. A general permit to take dolphins in compliance with those regulations was issued in 1980 to the American Tunaboat Association. In 1984 the Marine Mammal Protection Act was amended to extend indefinitely the annual quotas, the regulations, and the general permit and to add quotas for eastern spinner and coastal spotted dolphins. The terms of the general permit were further modified by amendments to the Marine Mammal Protection Act in 1988 and 1992. For 1992 total dolphin mortality by the U.S. fleet may not exceed 1,000 animals. In addition, the International Dolphin Conservation Act enacted on 26 October 1992 prohibited U.S. vessels from setting on any school in which an eastern spinner dolphin or coastal spotted dolphin is observed prior to release of the net skiff.

Estimates of the annual incidental kill of dolphins by the U.S. and foreign tuna purse seine fleets in the eastern tropical Pacific since passage of the Marine Mammal Protection Act are provided in Table 8. Although these are the best available mortality estimates, it should be recognized that the earlier estimates may not be accurate. Substantial observer coverage of the U.S fleet did not begin until 1976 and coverage remained below 50 percent until 1987. There were very few observers in the non-U.S. fleet prior to 1986, when observer coverage was approximately 25 percent. While there are anecdotal reports of marine mammals sets being made to catch tuna in areas other than the eastern tropical Pacific Ocean, the frequency of these sets is believed to be low. No data on the level of marine mammal mortality that results from these sets are available.

More detailed data for the last five fishing seasons are provided in Table 9. In addition to annual dolphin mortality data, information on mortality rates, fishing effort, and observer coverage are presented. Complete 1992 data for non-U.S. vessels are not yet available, but where possible, estimates based on partial-year data are provided.

Table 8. Estimated incidental kill of dolphins in the tuna purse seine fishery in the eastern tropical Pacific Ocean, 1972-1992[1]

Year	U.S. Vessels	Non-U.S.Vessels
1972	368,600	55,078
1973	206,697	58,276
1974	147,437	27,245
1975	166,645	27,812
1976	108,740	19,482
1977	25,452	25,901
1978	19,366	11,147
1979	17,938	3,488
1980	15,305	16,665
1981	18,780	17,199
1982	23,267	5,837
1983	8,513	4,980
1984	17,732	22,980
1985	19,205	39,642
1986	20,692	112,482
1987	13,992	85,185
1988	19,712	59,215
1989	12,643	84,336
1990	5,083	47,448
1991	1002	26,290
1992	439	—

[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 do not include deaths of seriously injured animals released alive.

The U.S. fleet continued to improve its performance in 1992. Although the fleet made a third more dolphin sets than it had in 1991, dolphin mortality was more than halved in 1992. A contributing factor was a marked reduction in the number of "problem sets," those sets in which large numbers of dolphins are killed. Of 582 dolphin sets conducted by U.S. fishermen in 1992, only four resulted in the deaths of 15 or more dolphins. About 85 percent of the sets resulted in no incidental mortality.

Table 9. Estimated U.S. and foreign dolphin mortality, kills per set, sets on dolphins, and percent observer coverage, 1988-1992[1]

	1988	1989	1990	1991	1992[2]
Dolphin Mortality					
U.S.	19,712	12,643	5,083	1,002	439
Foreign	59,215	84,336	47,448	26,290	<20,000
Total	78,927	96,979	52,531	27,292	<20,500
Kills per Set					
U.S.	5.28	3.60	2.75	2.49	0.58
Foreign	10.87	10.87	6.35	2.90	1.78
Combined	5.34	3.69	2.81	2.87	—
Sets on Dolphins					
U.S.	3,766	3,435	1,845	430	582
Foreign	6,749	9,145	8,770	9,052	9,500-11,000
Total	10,515	12,580	10,615	9,482	—
Observer Coverage[3]					
U.S.	53.2%	99.0%	100.0%	100.0%	100.0%[4]
Foreign	35.3%	35.5%	40.1%	56.4%	—
Combined	40.4%	48.2%	48.8%	59.7%	>65.2%[5]

1 Data provided by the National Marine Fisheries Service and the Inter-American Tropical Tuna Commission.
2 Figures for 1992 for the foreign fleet are preliminary estimates provided by the Inter-American Tropical Tuna Commission.
3 Observer coverages are given for the percentage of trips observed.
4 Includes observers placed under the United States and the Inter-American Tropical Tuna Commission observer programs.
5 The estimate of total observer coverage for 1992 does not include observers placed under the national programs of Mexico or the United States.

Based on preliminary data, it appears that the 1992 incidental mortality rate for the foreign fleet, as well as for the U.S. fleet, was the lowest since the fishery began. Since 1989 dolphin mortality incidental to the eastern tropical Pacific tuna fishery has been reduced by almost 80 percent.

As discussed below, the National Marine Fisheries Service published a final rule on 8 October 1991 changing the period used to make foreign comparability findings from a calendar year to a fishing year, running from 1 October to 30 September. For fishing year 1991, the U.S. fleet had an incidental mortality rate of 1.89 dolphins per set. The mortality rate of the U.S. fleet for fishing year 1992, against which 1992 comparability determinations for foreign fleets will be made, was 1.04 dolphins per set.

Vanuatu is the only nation whose tuna fleet made sets on dolphins during 1992 that has provided the United States with the data necessary to make a comparability finding. Those data indicate that Vanuatu's program will again be found comparable to that of the United States. Vanuatu achieved a kill rate of 0.8 dolphins per set, with eastern spinner and coastal spotted dolphins accounting, respectively, for 6.2 and 0.6 percent of the total mortality.

Implementation of the 1988 Amendments

In 1988 changes were enacted in the legislative program governing the take of marine mammals by the U.S. tuna fishery and the importation of yellowfin tuna taken by foreign fleets. These amendments and steps taken to implement them during 1992 are summarized below.

Domestic Program — Several modifications to the tuna-dolphin program for U.S. vessels were enacted in 1988. Specifically, restrictions were placed on U.S. vessels making sets that extend more than 30 minutes after sundown; U.S. vessels were required to carry an observer on every fishing trip made during 1989 and subsequent fishing seasons, unless for reasons beyond the control of the Secretary of Commerce an observer was not available; the use of explosives by U.S. fishermen to herd dolphins was prohibited; and performance standards designed to maintain the diligence and proficiency of vessel operators were imposed. Implementation of these provisions is discussed in previous annual reports. In summary, all of the requirements of the 1988 amendments with respect to the U.S. tuna fleet have been implemented. All that remains to be done is to issue final rules to replace the interim rules now in effect regarding vessel operator performance standards, sundown sets, experimental fishing permits, and the use of explosive devices to herd dolphins.

National Academy of Sciences Study — The 1988 amendments also directed the Secretary of Commerce to contract with the National Academy of Sciences for an independent review of possible alternative tuna fishing methods to reduce or eliminate the incidental take of marine mammals. This review was to have been completed by 8 September 1989 and the results submitted to Congress by 5 December 1989, along with a proposed plan from the National Marine Fisheries Service for research, development, and implementation of alternative fishing techniques. This schedule could not be met and the National Academy of Sciences report, *Dolphins and the Tuna Industry*, was not released until June 1992.

After an extensive analysis the Academy panel members were "unable to identify any currently available alternative to setting nets on dolphins that is as efficient as dolphin seining for catching large yellowfin tuna." The panel also was unable to identify practical modifications to gear or fishing techniques that could be made in the immediate future to reduce dolphin mortality to levels near or approaching zero. The panel therefore concentrated its efforts on identifying ways to achieve incremental improvements in dolphin mortality rates and on long-term research and regulatory options.

The panel determined that the single most important step to reduce dolphin mortality in the purse seine fishery is the improvement of operator performance. The panel recommended that an international meeting of governmental and industry representatives be convened to develop an educational certification and monitoring protocol for operators participating in the fishery and to identify possible incentives for improving operator performance. The panel also identified short- and long-term research that might lead to improvements in purse seine gear that would reduce incidental dolphin mortality.

In addition, the panel recommended that an extensive research program be undertaken to explore new methods of harvesting large yellowfin tuna not in association with dolphins. Promising avenues of research identified by the panel include investigation of the behavior of tuna and dolphin at night, when they might not associate and it may be possible to catch the tuna without encircling dolphins; new methods of purse seining; the use of fish aggregating devices (FADs); and the use of oceanographic data obtained from satellites to locate schools of tuna.

Comparability of Foreign Programs — As noted above, the Marine Mammal Protection Act was amended in 1984 to require that each nation exporting tuna to this country provide documentary evidence that it has adopted a program comparable to that of the United States and that the average rate of incidental take by its fleet is comparable to that of the U.S. fleet. Failure to show that these requirements have been met would result in a ban on the import of tuna and tuna products from the nation involved.

Dissatisfied with the Service's implementation of these requirements, Congress further amended the Act in 1988 to provide more specific guidance as to when foreign tuna-dolphin programs would be considered comparable to the U.S. program and to force timely implementation. The amendments required that, to be found comparable, a foreign program must include (1) by the beginning of the 1990 fishing season, prohibitions on encircling pure schools of certain marine mammals, conducting sundown sets, and such other activities as are applicable to U.S. vessels; (2) monitoring by observers from the Inter-American Tropical Tuna Commission or an equivalent interna-

tional program; and (3) observer coverage equal to that for U.S. vessels unless an alternative observer program with lesser coverage is determined to provide sufficiently reliable documentation of the nation's incidental take rate. In addition, the average incidental take rate for a foreign fleet could be no more than twice that of the U.S. fleet by the end of the 1989 season and no more than 1.25 times the U.S. rate by the end of the 1990 and subsequent seasons.

Limitations were also placed on the take of coastal spotted and eastern spinner dolphins. Beginning in 1989, eastern spinner dolphins could not account for more than 15 percent of the nation's total take and coastal spotted dolphins could not exceed 2 percent.

Litigation concerning the Service's interpretation of these requirements and resulting embargoes of yellowfin tuna and tuna products are discussed in the previous annual report. As noted in that discussion, the Service published an interim final rule on 8 October 1991 setting forth a revised schedule for issuing comparability findings. Under that rule the period from 1 October to 30 September constitutes a fishing year for purposes of comparing foreign dolphin mortality rates with that of the U.S. fleet. As the Act requires, findings regarding the percentage take of eastern spinner and coastal spotted dolphins, continue to be made on a calendar year basis. As a result of the new schedule, U.S. dolphin mortality for 1991 against which foreign performance was compared decreased from 2.53 to 1.89 dolphins per set.

Before a foreign program may be found comparable to the U.S. program, the Secretary must determine that its tuna fishing operations are monitored by the Inter-American Tropical Tuna Commission observer program, or an equivalent international program in which the United States participates, and that observer coverage is equal to that for U.S. vessels. Since January 1989 the United States has achieved 100 percent observer coverage. Under an exception to the general comparability requirement, however, foreign programs may have lesser observer coverage and still be found comparable if the Secretary determines that such a program will provide sufficiently reliable documentary evidence of the average rate of incidental taking by the harvesting nation.

The National Marine Fisheries Service determined that, for 1990, 33 percent coverage would provide sufficiently reliable data for fleets of ten or more vessels but that 50 percent observer coverage was necessary for fleets consisting of five to nine vessels. Although the Service found these levels to be statistically acceptable, it noted several benefits that would result from higher observer coverage and committed itself to seeking 100 percent coverage under the international observer program.

At the 17-20 September 1990 meeting of the Inter-American Tropical Tuna Commission, the Service sought and obtained agreement that observer coverage should be increased to levels approaching 100 percent. Consistent with this international agreement, the Service, on 18 October 1990, proposed to accept 75 percent observer coverage for all fleets in 1991 and 90 percent coverage for the 1992 and subsequent fishing seasons. By notice of 8 January 1992 the Service indicated that the minimum acceptable observer coverage for fishing year 1992 (1 October 1991-30 September 1992) would be 75 percent. To be found comparable to the U.S. program, foreign fleets must achieve 100 percent observer coverage during 1993 and subsequent fishing seasons.

Information on observer coverage provided by the Inter-American Tropical Tuna Commission since 1987 for the five major foreign fleets operating in the eastern tropical Pacific is provided in Table 10. With the exception of Mexico, these nations all attained or approached 100 percent observer coverage under the Tuna Commission program. However, in addition to participating in that program, Mexico, with assistance from the National Marine Fisheries Service, established a national observer program in 1991. While Mexican vessels carry Inter-American Tropical Tuna Commission observers on only about one-third of their trips, Mexican observers provide coverage for all other trips. Thus, when the two programs are considered together, Mexico also achieved 100 percent observer coverage in 1992. While not included in Table 10, observer coverage for Colombia increased from 40 percent in 1991 to 80 percent during 1992.

Table 10. Observer coverage of foreign tuna fleets by Inter-American Tropical Tuna Commission observers , 1987-1992[1]

	1987	1988	1989	1990	1991	1992
Ecuador	9.5	35.9	34.6	48.3	100.0	100.0
Mexico	26.8	38.4	35.4	37.6	35.2	36.6[2]
Panama	12.3	30.0	43.5	47.6	100.0	100.0
Vanuatu	31.0	30.0	35.4	52.2	94.4	98.3
Venezuela	21.8	31.3	35.2	37.1	47.9	100.0

1 Data provided by the National Marine Fisheries Service and the Inter-American Tropical Tuna Commission.
2 Only trips with Inter-American Tropical Tuna Commission observers are counted in this figure. Observers were placed on Mexican vessels for all other trips under Mexico's nation program.

On 9 January 1992 the Service published a notice in the *Federal Register* finding that Ecuador and Panama had met the comparability requirements for fishing year 1991. These countries had adopted legislation prohibiting their vessels from intentionally setting on marine mammals and had achieved 100 percent observer coverage during 1991. The finding for Panama was revoked on 22 December 1992 after it was learned that a Panamanian vessel intentional set on dolphins during two successive trips within a 180 day period. In addition, Panama enacted a decree on 20 October 1992 allowing its vessels to fish for tuna by setting on dolphins in accordance with dolphin mortality limits adopted in April 1992 at a special meeting of the Inter-American Tropical Tuna Commission. Inasmuch as its fleet made dolphin sets in 1992 and experienced a relatively high incidental mortality rate, it is unlikely that Panama's program will be found comparable in 1993.

A comparability finding for Vanuatu was published on 23 January 1992. During fishing year 1991, the Vanuatu fleet had achieved a mortality rate that was 0.92 times that for the U.S. fleet. During calendar year 1991, eastern spinner dolphins accounted for 7.46 percent of Vanuatu's incidental dolphin mortality and coastal spotted dolphins accounted for 0.55 percent. Mexico and Venezuela did not meet the comparability requirements and embargoes against tuna from these countries imposed in 1991 remained in effect during 1992.

By *Federal Register* notice of 28 April 1992 the Service issued a finding for Colombia. The Service determined that Colombia had enacted legislation to establish a tuna-dolphin program similar to the U.S. program. In addition, Colombia had submitted data from the Inter-American Tropical Tuna Commission observer program indicating that its fleet had no observed dolphin mortalities during the 1991 fishing year. However, observer coverage of the Colombian fleet in 1991 was only 40 percent. Because Colombia had failed to satisfy the 75 percent observer coverage requirement in effect for 1991, yellowfin tuna and tuna products from Colombia were embargoed.

Intermediary Nations — The 1988 amendments also restricted tuna imports from third-party nations seeking to ship yellowfin tuna to the United States. An intermediary nation must certify and provide reasonable proof that it has acted to prohibit the importation of tuna from any country banned from directly exporting tuna to the United States. Intermediary nations have 60 days following the imposition of a U.S. import ban to implement a similar prohibition on tuna imports from the embargoed harvesting nation. Failure to adopt a parallel import ban within six months requires certification of the intermediary nation under the Pelly Amendment to the Fishermen's Protective Act and may result in restrictions on imports of some or all fish products from that nation.

These requirements were implemented through an interim rule issued by the National Marine Fisheries Service on 7 March 1989. A final rule was issued on 30 March 1990. Under those regulations, intermediary nations were not required to implement a ban on tuna imports from a country embargoed by the United States if the Service were satisfied that the intermediary nation imports tuna products only from sources other than the embargoed country. The regulations also specified that an intermediary nation embargo would only apply to yellowfin tuna and tuna products harvested in the eastern tropical Pacific by a fishing nation that is subject to a primary embargo.

As discussed below, Earth Island Institute successfully challenged the Service's interpretation of the applicability and breadth of the tuna embargoes required under the Marine Mammal Protection Act's intermediary nation provision. The court ruled that a secondary embargo must be imposed unless the intermediary nation has acted to prohibit the importation of yellowfin tuna subject to a primary embargo by the United States. It also found that intermediary nation embargoes apply to all yellowfin tuna from the intermediary nation regardless of where or how the tuna were harvested.

As a result of that ruling, secondary embargoes were imposed on all yellowfin tuna and tuna products imported from 20 intermediary nations effective 31 January 1992. The secondary embargoes were subsequently lifted for nine of those nations when they submitted documentation sufficient to demonstrate that they either were not intermediary nations or had acted to ban yellowfin tuna imports from those nations subject to the primary embargoes.

On 30 March 1992 the National Fisheries Institute petitioned the National Marine Fisheries Service to revise its regulatory definition of "intermediary nation." The petitioners believed that a redefinition to exclude nations that import only "dolphin-safe" tuna would be consistent with the requirements of the Marine Mammal Protection Act. The Service reviewed that petition and determined that a redefinition was permissible under the statutory language and the court's ruling. After submitting its revised definition of "intermediary nation" to the court for review, the Service adopted it as an interim rule on 11 September 1992. The new definition excluded those nations that certify and provide reasonable proof that they have not, within the preceding six months, imported any yellowfin tuna or tuna products subject to a direct ban on importation into the United States.

Congress also addressed the question of intermediary nations through passage of the International Dolphin Conservation Act of 1992. That Act, signed into law on 26 October 1992, statutorily defined the term "intermediary nation." The High Seas Driftnet Enforcement Act, enacted on 2 November 1992, also defined the term "intermediary nation." It also amended the substantive provisions of the Marine Mammal Protection Act regarding intermediary nations. While the provisions of these new laws are not identical, they are consistent with the interim rule adopted by the Service. Only those nations that import yellowfin tuna and tuna products from harvesting nations subject to an embargo on direct exports to the United States are considered to be intermediary nations. Any nation that certifies and provides reasonable proof that it has not imported tuna from an embargoed harvesting nation within the previous six months is not subject to a secondary embargo.

Under the new statutory provisions, secondary embargoes against tuna imports from seven countries were lifted. At the end of 1992 secondary embargoes remained in effect for four intermediary nations, Costa Rica, Italy, Japan, and Spain.

Regardless of whether it is a harvesting nation or an intermediary nation, any nation from which tuna has been embargoed for six months is to be certified by the Secretary of Commerce and may face additional sanctions under the Pelly Amendment. While both harvesting nations and intermediary nations have been certified, no sanctions on other fish products have been imposed.

Report to Congress — The 1988 amendments to the Marine Mammal Protection Act required the National Marine Fisheries Service to convene annual meetings with representatives of conservation groups, the tuna fishing industry, and other interested parties to discuss the results of efforts to reduce the incidental mortality of dolphins in the eastern tropical Pacific tuna fishery and to develop plans for such efforts

during the subsequent year. The Service was also required to submit a comprehensive report to Congress by 1 April 1992 setting forth the results of the efforts to reduce dolphin mortality and recommendations for actions that should be taken to reduce incidental mortality further.

The Service convened the third and last of the annual reviews on 13-14 November 1991. In addition to representatives of conservation groups, U.S. tuna fishermen, U.S. tuna canners, the Marine Mammal Commission, and other Federal agencies, participants included representatives of the Inter-American Tropical Tuna Commission and several tuna fishing nations. Data and trends for the 1990 and 1991 fishing seasons and research underway to develop tuna fishing methods that do not involve setting on dolphins were discussed.

In July 1992 the National Marine Fisheries Service published the report of the third annual review meeting. As required, the report discusses efforts undertaken by the Service and others to reduce incidental dolphin mortality. The report identifies four goals that, if achieved, would significantly reduce or eliminate incidental dolphin mortality and recommends actions towards achieving those goals.

The first goal is to develop and evaluate methods of purse seine fishing for tuna that do not involve chasing or encircling dolphins. Recommended actions for achieving this goal include (1) investigating the potential utility of fish aggregating devices as a way of capturing yellowfin tuna not associated with dolphins; (2) investigating the potential utility of optical scanners as an alternative method of locating schools of tuna; and (3) examining the association between tuna and dolphins to determine if there are times when tuna can be caught without encircling dolphins.

The second goal is to develop fishing methods that involve chasing but not encircling dolphins. The report recommended that acoustic, visual, and chemical stimuli be explored as possible ways to separate associated tuna and dolphins before encirclement.

The third goal is to improve existing purse seine fishing techniques to decrease incidental dolphin mortality to levels approaching zero. Among the actions recommended to pursue this goal are (1) investigating the use of acoustic doppler current profilers to detect subsurface currents that may cause purse seine nets to collapse; (2) evaluating different net materials, cable materials, hang-ratios, and cork lines as possible ways to reduce the incidence of roll-ups and net collapse; (3) assessing the utility of jet skis to free entangled dolphins from purse seine nets; (4) developing an international program to educate skippers about new developments in dolphin saving fishing techniques; (5) establishing an international skipper performance program to identify and remove sub-standard operators; and (6) establishing an international dolphin quota that would be reduced and eliminated over a fixed period of time.

The final goal identified in the Service's report is to develop alternative methods for catching tuna that do not involve the use of purse seine nets. Among the possible alternatives methods noted by the Service are the use of pair trawls and longline fishing.

Status of Dolphin Stocks

As discussed in the previous annual report, environmental groups petitioned the National Marine Fisheries Service in 1991 to have the eastern spinner dolphin (*Stenella longirostris orientalis*) and the northern offshore stock of spotted dolphins (*Stenella attenuata*) designated as depleted under the Marine Mammal Protection Act and listed as threatened under the Endangered Species Act. The petitioners asserted that these stocks had been reduced substantially since the 1950s by the eastern tropical Pacific tuna fishery.

Under the Marine Mammal Protection Act, any population that is below its maximum net productivity level, the lower bound of the optimum sustainable population range, is considered to be depleted. The National Marine Fisheries Service has determined that maximum net productivity in small cetaceans, such as these dolphin species, occurs at about 60 percent of carrying capacity. A threatened species is one "which is likely to become endangered in the foreseeable future throughout all or a significant portion of its range."

On 17 June 1992 the National Marine Fisheries Service published a proposed rule to designate the

eastern spinner dolphin as depleted. The Service based the proposed determination in large part on data collected from population surveys it had conducted in the eastern tropical Pacific between 1986 and 1990. When the best estimate of the current population size from those surveys, 565,800, is compared to an estimate of the pre-exploitation population size made in 1979, the population is considered to be at 33 percent of its carrying capacity, well below its maximum net productivity level.

The Service published a proposed rule on 18 June 1992 to designate the northern offshore spotted dolphin as depleted. The best estimate of the current size of this dolphin population derived from the 1986-1990 survey cruises, 1,651,600, was determined by the Service to be 27 percent of the 1979 estimate, or about 23 percent of its carrying capacity.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, commented on the proposed depletion designations by letter of 28 August 1992. The Commission noted that the best available estimates of eastern spinner and northern offshore spotted dolphin abundance are those derived from the multi-year Monitoring of Porpoise Stocks (MOPS) surveys as revised following the November 1991 workshop on the status of eastern tropical Pacific dolphin stocks. When the 1991 estimate of eastern spinner abundance is compared with the best available estimate of its pre-exploitation stock size, it is clear that the eastern spinner dolphin is well below its probable maximum net productivity level (MNPL) and should be designated as depleted.

While no pre-exploitation abundance estimate for the northern offshore spotted dolphin was provided in the proposed rule, the Commission found that the Service had made a credible case that the stock is depleted. The proposed rule indicated that significant numbers of northern offshore spotted dolphins were killed incidental to the yellowfin tuna fishery during the 1960s and early 1970s. The high level of incidental mortality during that period almost certainly caused a marked reduction in the abundance of the stock prior to 1975. Relative abundance estimates presented in the proposed rule indicate that the stock has declined considerably further since the mid-1970s and is, in all likelihood, below its maximum net productivity level. Nevertheless, the Commission recommended that the Service in its final rule discuss the likely magnitude of the stock's decline during the 1960s and 1970s and provide the Service's best estimate of the stock's pre-exploitation abundance.

In further support of the proposed depletion findings, the Commission noted that there is no reason to believe that the carrying capacity of the eastern tropical Pacific Ocean ecosystem has been reduced during the past three decades. Thus, it does not appear that the observed declines in these dolphin stocks are a result of environmental change.

The Commission also recommended that the final rule discuss the possible consequences of the depletion designations and describe any actions the Service would take following issuance of the findings. In this regard, the Commission noted that section 115(b)(1) of the Marine Mammal Protection Act requires the Service to prepare a conservation plan for any species or stock designated as depleted unless it determines that such a plan will not promote the conservation of the species or stock. The Commission asked that the Service indicate in the final rule whether it intends to prepare conservation plans for the eastern spinner and northern offshore spotted dolphins. If the Service decides not to prepare such plans, the Commission requested that the Service explain its rationale for determining that the plans would not promote the conservation of the stocks and describe what actions it intends to take (*e.g.*, continued monitoring) in response to the depletion findings.

The Commission also noted that many of the analyses presented in the proposed rules, including analysis of data from the dolphin monitoring surveys, have only recently become available. The Commission therefore requested that the Service promptly review the available information for other dolphin stocks, particularly the northern stock of the common dolphin and the coastal stock of the spotted dolphin, and advise the Commission as to whether other depletion designations may be warranted.

On 2 September 1992 the Service published a *Federal Register* notice presenting new information on the structure of spotted dolphin stocks that occur in the eastern tropical Pacific Ocean. Based upon two

reports published in 1992, the Service believes that the northern offshore stock of spotted dolphins should be reclassified as the northeastern stock. In light of the new information on stock structure and the geographical distribution of those stocks, the Service reopened the comment period on the proposed depletion designation until 4 January 1993.

As of the end of 1992 the Service had yet to issue a final rule regarding the designation of the eastern spinner dolphin as depleted. Also, the Service had not provided the Commission with an assessment of whether depletion designations for other stocks of dolphins affected by the eastern tropical Pacific tuna fishery may be warranted.

The National Marine Fisheries Service on 19 October 1992 published a determination that listing the eastern spinner dolphin under the Endangered Species Act as threatened was not warranted. The Service's determination was based primarily on population persistence analyses it had done. Given the current level of taking incidental to the tuna fishery, the Service determined that the population will remain viable in perpetuity.

No finding with respect to the petition to list the northern offshore spotted dolphin as threatened had been issued as of the end of 1992.

Inter-American Tropical Tuna Commission

The Inter-American Tropical Tuna Commission is an international body established in 1949 to study the tuna resources of the eastern tropical Pacific Ocean and make recommendations for the management and conservation of those resources. As the foreign share of the purse seine fishery grew, and the associated marine mammal mortality increased, the role of the Tuna Commission was expanded. Beginning in 1977 the Tuna Commission was charged with monitoring incidental mortality of dolphins throughout the fishery, assessing the impact of that mortality on dolphin stocks, and introducing measures to reduce the level of take to the maximum extent possible.

At a special meeting of the Inter-American Tropical Tuna Commission held in September 1990, participants from all nations with a significant interest in the eastern tropical Pacific tuna fishery, whether members of the Commission or not, met and adopted a resolution calling for an expanded dolphin conservation program. The program has a short-term goal of significantly reducing dolphin mortality and a long-term goal of reducing dolphin mortality to insignificant levels approaching zero. Under the agreement, these goals are not paramount, but are to be pursued in concert with the goal of maintaining optimal utilization and conservation of the tuna resource. Among other things, the international program calls for (1) limits on dolphin mortality; (2) 100 percent observer coverage; (3) research programs to improve existing fishing gear and techniques and to investigate possible alternative fishing methods that may eliminate dolphin mortality; and (4) a training program to improve operator performance throughout the international fleet.

At a subsequent meeting held in January 1991 parties to the intergovernmental agreement expressed their willingness to make their best efforts to (1) achieve 100 percent observer coverage; (2) contribute to the funding of the Inter-American Tropical Tuna Commission's observer program; (3) support research programs to identify and develop alternative fishing techniques to catch large yellowfin tuna without setting on dolphins; (4) reduce dolphin mortality in 1991 by 50 percent as compared to 1989; and (5) continue to develop and implement a dolphin conservation program in 1992 and subsequent years.

Further efforts to achieve a reduction in dolphin mortality were undertaken at a special meeting of the Tuna Commission held on 21-23 April 1992. Participating governments resolved to adopt a multilateral program to reduce incidental dolphin mortality in the eastern tropical Pacific to levels approaching zero by setting annual limits. The annual limits on total incidental dolphin mortality established under the resolution are 19,500 in 1993, 15,500 in 1994, 12,000 in 1995, 9,000 in 1996, 7,500 in 1997, 6,500 in 1998, and less than 5,000 in 1999. The parties further agreed to adopt a mechanism by 1 July 1992 to ensure compliance with these limits. Other aspects of the program adopted under the resolution are (1) the continuation of the international observer program with the additional requirement that at least 50 percent of the observers deployed by a nation each year are to

be Tuna Commission observers; (2) the establishment of a review panel to monitor compliance by the international fleet with the annual dolphin mortality limits; (3) expansion of the existing research and education programs, including an increase in efforts to find methods of catching large yellowfin tuna that do not involve encirclement of dolphins; and (4) establishment of a scientific advisory board to make recommendations on the Commission's research program.

The Tuna Commission met again on 16-18 June 1992 to adopt a mechanism to implement the dolphin quotas established at the April meeting. The parties agreed to a system whereby each vessel participating in the fishery would be given an individual dolphin mortality limit (DML). Each nation was required to submit to the Tuna Commission by 1 October 1992, the names of those vessels under its jurisdiction expected to set on dolphins in the eastern tropical Pacific tuna fishery during 1993 and for which a vessel quota would be assigned. The 1993 dolphin mortality limit was set by dividing the total allowable mortality (19,500) by the number of qualified vessels seeking a quota. Each party nation was given the latitude to adjust the limits for vessels under its jurisdiction, provided that the sum of the individual vessel limits does not exceed the aggregate for the nation's fleet as a whole and no vessel is assigned an adjusted quota that exceeds its original quota by more than 15 percent. Such adjustments were to be made by 1 December 1992 and shall be applied during the 1993 fishing season. Any vessel that leaves the fishery or that does not use any of its quota by 1 June 1993 shall forfeit its quota for the remainder of the year. Unused quotas may be allocated to other vessels for the last half of 1993. Any vessel that exceeds its dolphin limit during 1993 will have the amount of the excess deducted from its 1994 limit.

A resolution adopted at the Tuna Commission's June meeting set forth the functions and responsibilities of the review panel that will monitor compliance with the international dolphin mortality quotas. The review panel will be composed of nine members, five of whom will be representatives of participating governments. The other four members will be two representatives of environmental organizations and two representatives of the tuna fishing industry.

The review panel held its first meeting on 15-16 October 1992 and accepted the lists of vessels submitted by the party governments, which contained 106 vessels. Each vessel was given a dolphin mortality limit for 1993 of 183 dolphins. Of the 106 vessels given quotas, 50 are from Mexico, 27 from Venezuela, 14 from the United States, 10 from Vanuatu, 3 from Panama, and 2 from Colombia. The panel scheduled its next meeting for January 1993, when it will consider criteria to qualify vessels to receive a dolphin mortality limit, procedures for removing vessels from the list if they do not use their quotas, and multilateral mechanisms to ensure compliance with dolphin quotas and other provisions of the intergovernmental agreement.

Legislation

The 1988 amendments to the Marine Mammal Protection Act established new requirements for U.S. tuna fishermen and for foreign tuna fleets that export tuna to the United States. Since then, additional amendments applicable to the eastern tropical Pacific tuna fishery have been enacted. As discussed in previous annual reports, the Dolphin Protection Consumer Information Act was enacted in 1990 as part of the Fishery Conservation Amendments of 1990. It set forth criteria for when tuna and tuna products may be labeled "dolphin-safe" and established a fine of up to $100,000 as the penalty for knowingly mislabeling tuna caught in ways that are not dolphin-safe.

As noted in the previous annual report, the Department of State committed itself at a January 1991 intergovernmental meeting of tuna fishing nations to seek amendments to the tuna embargo provisions of the Marine Mammal Protection Act. The Department transmitted proposed legislation to Congress in June 1991. Under the proposal, tuna would not be subject to an embargo if the harvesting nation (1) participates in an international dolphin conservation program in which the United States participates, (2) participates in research designed to find alternative ways to catch yellowfin tuna without setting on dolphins, (3) has 100 percent observer coverage, (4) achieved a 50 percent reduction in dolphin mortality in 1991 as compared to 1989; and (5) achieved a 60 percent reduction in mortality in 1992 as compared to 1989.

A revised State Department proposal, under which tuna embargoes would be lifted for those tuna harvesting nations that committed to a five-year moratorium on the practice of setting purse seine nets on dolphins, was submitted to Congress in 1992. That proposal formed the basis of the International Dolphin Conservation Act of 1992 (Pub. L. 102-523), which was enacted on 26 October 1992 to amend the Marine Mammal Protection Act by adding a new Title III. [It should be noted that subsequent legislation (the Marine Mammal Health and Stranding Response Act) added a second Title III to the Act. The amendments enacted by the International Dolphin Conservation Act of 1992 were codified at 16 U.S.C. §§ 1411-1418.]

The amendments call on the Secretary of State, in consultation with the Secretary of Commerce, to enter into international agreements to establish a global moratorium of at least five years duration on harvesting tuna by setting purse seine nets on marine mammals. The moratorium called for in the amendments would take effect on 1 March 1994, but would be binding on the United States only if a major tuna harvesting nation (one with 20 or more active purse seine vessels in its tuna fleet) commits to the moratorium. The amendments require that such agreements provide for an international research program to develop methods of catching large yellowfin tuna without setting nets on dolphins or other marine mammals, or if marine mammal sets are made, without any incidental mortality. In addition, parties to these agreements must take all necessary and appropriate steps to ensure compliance with the moratorium. Countries that commit to the moratorium but that do not meet their commitments, would be subject to an embargo of yellowfin tuna and other fish and fish products.

Research conducted pursuant to these agreements is to be reviewed and authorized by a competent regional organization, which, for the eastern tropical Pacific, is the Inter-American Tropical Tuna Commission. Under the program called for by the amendments, no more than 400 research sets on dolphins may be made annually, and incidental dolphin mortality that results from the research may not exceed 1,000 per year. The Act authorizes $3 million to be appropriated to the National Marine Fisheries Service for each of the fiscal years 1993-1998 to be used for the research program. Research funds provided by the United States, however, may only be used for investigating fishing methods that do not involve setting on marine mammals. The amendments also require that the Marine Mammal Commission review and comment on all research proposals submitted to the Inter-American Tropical Tuna Commission.

A tuna fishing nation that transmits to the United States a formal commitment to abide by the moratorium on harvesting tuna by setting on marine mammals beginning on 1 March 1994, and meets other requirements, will not be subject to an embargo of its tuna that may otherwise apply under section 101(a)(2) of the Marine Mammal Protection Act. In addition to committing to the moratorium, the fishing nation must require an observer to be carried on board each vessel larger than 400 short tons carrying capacity that uses purse seine nets to fish for yellowfin tuna in the eastern tropical Pacific. The nation also must reduce incidental dolphin mortality resulting from operation of its fleet by a statistically significant margin in 1992, as compared to 1991, and in 1993, as compared to 1992. Under the amendments, at least 50 percent of the observers placed on a nation's vessels must be responsible to, and supervised by, a competent regional organization such as the Tuna Commission.

If a country fails to meet its commitment to abide by the moratorium or to satisfy the observer or mortality reduction requirements, the Secretary of Commerce is to notify the President and Congress of such failure. Fifteen days after that notification, the Secretary of the Treasury is to ban the importation of yellowfin tuna and yellowfin tuna products from the offending country. If within 60 days of the imposition of such a ban, the country does not provide reasonable proof that it has fully implemented its commitments or has taken actions to remedy its failure, a ban on the importation of other fish and fishery products from the offending nation is to be imposed. While the President has some latitude as to what fish and fishery products will be banned, the aggregate amount must equal 40 percent of the value of all fishery products imported from the offending nation during the preceding year. These import bans will remain in effect until such time as the Secretary of Commerce determines that the nation is meeting its commitments with respect to the dolphin conservation program.

The International Dolphin Conservation Act of 1992 also amended the general permit held by the American Tunaboat Association on behalf of U.S. tuna fishermen. That permit, originally issued in 1980, and legislatively extended in 1984, had authorized the U.S. fleet to kill up to 20,500 dolphins annually incidental to its fishing operations. Recognizing that the number of U.S. vessels fishing for tuna by setting on dolphins had greatly declined since the permit was issued, Congress reduced the 1992 quota for total dolphin mortalities by the U.S. fleet, including those resulting from research, to 1,000. The quota for the period between 1 January 1993 and 1 March 1994 was set at 800. In addition, the permit was amended to prohibit purse seine nets from being deployed to encircle any school of dolphins in which any eastern spinner dolphin or coastal spotted dolphin is observed prior to release of the net skiff.

If any major tuna fishing nation commits to the international moratorium on setting on marine mammals to catch tuna, the American Tunaboat Association's permit will expire on 1 March 1994. If no major tuna fishing nation commits to the moratorium, the permit will continue in effect until 31 December 1999, but with the additional requirement that incidental dolphin mortality be reduced by statistically significant amounts each year. As of the end of 1992, no nation had yet committed to the moratorium.

The International Dolphin Conservation Act of 1992 also places new restrictions on the sale of tuna in the United States. After 1 June 1994, regardless of whether the moratorium on dolphin sets is implemented, it will be unlawful to sell, purchase, offer for sale, transport, or ship any tuna or tuna product in the United States that is not "dolphin-safe." As noted above, the Act also included a statutory definition of the term "intermediary nation" to clarify which nations are subject to secondary tuna embargoes under the Marine Mammal Protection Act.

Litigation Related to the Tuna-Dolphin Issue

A lawsuit originally filed by Earth Island Institute on 12 April 1988 (*Earth Island Institute* v. *Mosbacher*), before enactment of the 1988 amendments to the Marine Mammal Protection Act, continued to affect the U.S. tuna-dolphin program during 1992. Earlier rulings in the case focused on the observer requirements for both the U.S. and foreign fleets and on the embargo provisions applicable to foreign nations that fish for tuna in the eastern tropical Pacific. These are discussed in previous annual reports.

During 1992 the focus of the case has been the applicability and breadth of the secondary embargoes required under the intermediary nation provision of the Marine Mammal Protection Act. Section 101(a)(2)(C) of the Act requires that tuna imports from intermediary nations be embargoed unless the government of the intermediary nation that exports yellowfin tuna or tuna products to the United States certifies that it has acted, within 60 days of a U.S. embargo, to prohibit the importation of such tuna from those nations that are banned from directly exporting tuna to the United States. Plaintiffs asserted that a secondary embargo under section 101(a)(2)(C) is broader than the underlying primary embargo and applies to all yellowfin tuna and tuna products. Plaintiffs also maintain that the Secretary of the Treasury was not obtaining the required certifications from all intermediary nations before allowing tuna from those nations to be imported into the United States. The Service contended that the scope of the secondary embargo is the same as the scope of the primary import ban. That is, a secondary embargo applies only to yellowfin tuna harvested with purse seine nets in the eastern tropical Pacific by embargoed fishing nations.

The district court issued its ruling on 10 January 1992. The court found that the secondary embargo provisions require every intermediary nation to provide certification and reasonable proof that it has acted to prohibit the importation of the same products that are banned from direct export to the United States. Failure to meet these requirements subjects the nation to the statutory ban, which prohibits the importation of all yellowfin tuna and tuna products from that nation, not just those subject to the underlying embargo of tuna from the harvesting nation. Based on this interpretation, the court found that the Federal Government was not in compliance with the provisions of the Marine Mammal Protection Act. The court also ruled that, to overcome the secondary embargo, it is insufficient for an intermediary nation

merely to demonstrate that it does not import, or has discontinued importing, tuna subject to a primary embargo. Rather, the intermediary nation must show that it has acted to prohibit the importation of the offending tuna and tuna products.

The Federal Government filed a notice of appeal in the case on 25 February 1992. The Government subsequently set forth three grounds for its appeal. First, it argued that the district court lacked jurisdiction over plaintiff's claims for imposition of an embargo against intermediary nations. The Government contended that exclusive jurisdiction over such claims rests with the Court of International Trade. Second, the Government asserted that the district court erred in concluding that the scope of the secondary embargoes applicable to intermediary nations is broader than the primary embargoes upon which they are based. Third, defendants claimed that the district court misconstrued the provisions of the Marine Mammal Protection Act when it ruled that intermediary nations that do not import any yellowfin tuna or tuna products from embargoed nations are subject to the secondary embargo unless they formally acted to prohibit such imports.

A stay of the appeal was requested by the parties on 31 July 1992 when it appeared that Congress might adopt amendments to the Marine Mammal Protection Act that could make the appeal moot. A stay was granted and subsequently extended to enable the parties to pursue settlement discussions in light of the enactment of the International Dolphin Conservation Act of 1992. At the end of 1992 the stay remained in effect and the parties were trying to settle the case.

General Agreement on Tariffs and Trade

The General Agreement on Tariffs and Trade (GATT) is an international agreement that sets forth limitations on the use of international trade restrictions, such as taxes, duties, quotas, or unnecessarily restrictive standards. The agreement was originally drafted in 1947 and currently has more than 100 contracting parties, including the United States. Trade disputes that may arise between contracting parties are settled either by consultations between the parties, or if consultations prove unsuccessful, by referral to a formal dispute panel.

On 5 November 1990 Mexico requested consultations with the United States concerning the imposition of tuna import restrictions under the Marine Mammal Protection Act. When those consultations failed to resolve the dispute, Mexico requested that a panel be established under the General Agreement. Mexico asserted that the Marine Mammal Protection Act's embargo provisions were inconsistent with the General Agreement. It also challenged the possible broadening of trade sanctions under the Pelly Amendment, the intermediary nation embargoes, and the tuna labeling provisions of the Dolphin Protection Consumer Information Act.

The panel delivered its decision to the GATT contracting parties on 3 September 1991. The panel found the U.S. embargo of Mexican tuna to be inconsistent with the General Agreement. The panel rejected the U.S. position that the embargo was consistent with General Agreement Article III because the Marine Mammal Protection Act constituted an internal measure that treated foreign-caught tuna no less favorably that tuna caught by the U.S. fleet. The panel found that Article III was not applicable in this instance because the trade measure was not applied to tuna as a product, but rather to the method of production. Having found that Article III did not apply, the panel determined that the Act's embargo provision violated General Agreement Article XI, which prohibits quantitative restrictions on imports.

The panel then considered arguments made by the United States that the embargo provision fits within exceptions under Article XX(b) and XX(g) that allow contracting parties to adopt trade measures "necessary to protect human, animal or plant life or health" or "relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption." The panel found that Article XX(b) did not apply to measures taken to protect the life or health of animals beyond the jurisdiction of the country applying the measures. Similarly, the panel found that the Article XX(g) exception did not apply extrajurisdictionally. To interpret the provision more broadly would allow contracting parties to dictate unilaterally the environmental policies from which other countries could not deviate without jeopardizing their rights under the General Agreement.

The panel also determined that, even if the Article XX exceptions could be applied extrajurisdictionally, they would not be available in the case of the tuna embargoes. In the panel's view, the United States had not demonstrated that the embargoes were "necessary" within the meaning of Article XX(b) or "primarily aimed at conservation" within the meaning of Article XX(g) because there had been no showing that other, less restrictive means of addressing the tuna-dolphin problem, such as international agreements, were unavailable.

Using identical reasoning, the panel found the intermediary nation embargo provision of the Marine Mammal Protection Act to be inconsistent with the General Agreement. The Pelly Amendment provisions were found not to be inconsistent with the General Agreement. While indicating that trade sanctions imposed under the Pelly Amendment would likely be found inconsistent with the General Agreement, the panel stated that a statutory provision that authorizes, but does not require, trade measures inconsistent with the General Agreement is not itself in conflict with the General Agreement. The tuna labeling requirements of the Dolphin Protection Consumer Information Act were determined to be consistent with the General Agreement.

Under GATT procedures, a panel decision does not become effective until it has been adopted unanimously by the GATT Council of Representatives. That is, one nation can block adoption of the decision. Shortly after release of the panel's decision, 62 members of the U.S. Senate wrote to the President asking that the United States block adoption. Pending further bilateral negotiations, Mexico and the United States agreed not to have the panel decision considered by the GATT Council. Unless and until the Council adopts the decision, the United States is under no obligation to bring its domestic law into conformance with the General Agreement.

During 1992 Mexico and the United States continued negotiations to resolve the dispute over the tuna embargoes without further proceedings under the General Agreement. As such, the panel's decision has yet to be adopted.

A separate challenge to the tuna embargo provisions of the Marine Mammal Protection Act was filed under the GATT in 1992 by the European Community and The Netherlands on behalf of the Netherlands Antilles. The European Community requested the formation of a GATT panel to consider the secondary tuna embargo provisions of the Act. On 14 July 1992 the GATT Council granted that request. Proceedings in the matter were suspended following passage of the International Dolphin Conservation Act to enable the parties to pursue further consultations. Those consultations failed to resolve the dispute and the European Community and The Netherlands indicated in December that they intend to file brief with the GATT panel early in 1993.

The Bering Sea and Gulf of Alaska Ecosystems

Since the mid-1970s there have been alarming declines in populations of northern fur seals, Steller sea lions, harbor seals, and four species of fish-eating seabirds in certain parts of the Bering Sea and Gulf of Alaska. The cause or causes of the declines are not clear. Possibilities include entanglement in lost and discarded fishing gear; incidental take in driftnet, trawl, and other fisheries; decreased food availability due to harvesting of pollock or other finfish and/or due to environmental changes affecting the distribution, abundance, or productivity of pollock or other important prey species; naturally occurring diseases; intentional shooting; and environmental pollution.

In December 1990 the Commission and the National Marine Fisheries Service jointly sponsored a workshop to (1) identify critical uncertainties concerning the causes of and the possible relationships among the observed population declines; (2) identify the research that would be required to resolve the uncertainties; and (3) determine how to improve research planning and resource management in both the Bering Sea and the Gulf of Alaska. The workshop report (see Appendix B, Swartzman and Hofman 1991) was forwarded to the National Marine Fisheries Service, the Fish and Wildlife Service, and the National Science Foundation on 25 July 1991.

In its letter transmitting the report to the National Marine Fisheries Service, the Commission noted that the workshop participants had concluded, among other things, that available information was insufficient to determine whether the observed population declines are related or whether they are due to natural or human causes or a combination of factors. The Commission also noted that the workshop participants had questioned whether data and procedures currently being used to establish fish catch limits provide adequate assurance that fisheries are not reducing target fish stocks to levels that would affect other species. In addition, the Commission noted that the workshop participants had pointed out that many agencies were carrying out related studies, but that the studies were not being planned or conducted cooperatively and that much of the resulting data were not readily accessible or in a form that allowed easy comparison.

With regard to the last point, workshop participants recommended that a directory of data and data sources concerning the Bering Sea and Gulf of Alaska be developed and made readily available; that a common data management system be developed and used to facilitate archiving, accessing, mapping, and integrating marine mammal, seabird, fish, fishery, environmental, and other data; that an interagency group be constituted to plan and coordinate U.S. research in the area; that an existing forum, such as the North Pacific Marine Science Organization (see below) or a new forum be used to facilitate planning and coordinating international research and management programs in the area; and that a workshop be held to consider and provide advice on (a) thresholds below which exploitation of fish stocks should be prohibited to ensure maintenance of target, dependent, and associated species at optimum sustainable levels, and (b) guidelines and procedures for dealing with uncertainty concerning the status of fish stocks and other components of the ecosystems of which they are a part and their numerical and functional relationships.

To begin addressing these points, the Commission recommended in its 25 July letter, that the National Marine Fisheries Service give priority attention to developing a data directory and a more efficient system for archiving, accessing, and integrating data concerning components of the Bering Sea and the Gulf of Alaska. The Commission also recommended that the Service consult with the Fish and Wildlife Service, the Minerals Management Service, the National Science Foundation, the Alaska Department of Fish and Game, and other relevant organizations to determine if a common or otherwise integrated geographic information system might facilitate data management and analysis.

To help determine the possible advantages and disadvantages of a common or coordinated geographic information system, the Commission contracted for a study to determine (a) the types of marine mammal and related habitat, environmental, fisheries, and other data being collected and held by various Federal and State of Alaska agencies, private institutions, and other organizations; (b) how these data are archived and can be accessed; and (c) what geographic information systems are now being used for data management and analysis.

The contract report (see Appendix B, Hoover-Miller 1992) indicated that a number of Federal and State agencies and private institutions — including the National Marine Fisheries Service, the National Ocean Survey, the Fish and Wildlife Service, the Forest Service, the Alaska Department of Fish and Game, the Alaska Department of Natural Resources, and the Prince William Sound Research Center — are using a variety of geographic information systems to archive, map, and analyze a broad range of data with relevance to conservation of marine mammals and other biota in the Bering Sea and Gulf of Alaska. The report recommended that a meeting of appropriate representatives of these agencies and private organizations be held to better determine the types of marine mammal and related data being collected and maintained and how the data are being archived and can be accessed; determine if the Arctic Environmental Data Directory being maintained by the U.S. Geological Survey will provide or can be modified to provide a useful source of marine mammal and related environmental data; exchange information on the hardware and software now being used in geographic information systems; and determine the possible benefits and costs of developing a common or interactive geographic information system.

The report further recommended that, if participants in the recommended meeting conclude that the potential benefits of a common or interactive geographic information system would outweigh the costs, a formal working group be established to overview development of a system. Among other things, this working group would be tasked with developing and agreeing upon (a) a common set of baseline maps for the Bering Sea and Gulf of Alaska; (b) standard protocols for collecting, reporting, and archiving various types of data; and (c) standard procedures for verifying the reliability of the data and ensuring that they are used appropriately.

The Commission forwarded the contract report to the National Marine Fisheries Service on 10 December 1992. In its transmittal letter, the Commission noted that it concurred with the report recommendations. It also noted that the first step was to organize and hold the recommended meeting of agency representatives. In view of the National Marine Fisheries Service's responsibilities for fisheries and marine mammal research and management, the Commission noted that the Service was the logical agency to organize and convene the meeting, and it recommended that the Service do so as quickly as possible.

The North Pacific Marine Science Organization (PICES)

In December 1990, Canada, Japan, the People's Republic of China, the Soviet Union, and the United States concluded the Convention for the North Pacific Marine Science Organization (PICES). The Convention is patterned after the Convention for the International Council for the Exploration of the Sea (ICES), which was concluded in 1964 to promote and encourage research and dissemination of information concerning the living resources and other aspects of the North Atlantic Ocean and adjacent seas. [The term "PICES" is a formal part of the title of both the 1990 Convention and the organization that it established. It is intended to connote a "Pacific International Council for the Exploration of the Sea," it is not an acronym.]

The PICES Convention entered into force in March 1992. An organizational meeting of the Governing Council established by the Convention was held on 24 March. At that meeting, the Council elected a chairman, adopted rules of procedure, and agreed that a permanent secretariat would be established at the Institute of Ocean Sciences in Sidney, British Columbia, Canada. On a provisional basis, the Council established standing scientific committees on fishery science, biological oceanography, physical oceanography and climate, and marine environmental quality.

The first regular meeting of the Governing Council and the organizational meetings of the provisional scientific committees were held in Victoria, British Columbia, on 12-17 October 1992. At the meeting, the Governing Council appointed an Executive Secretary and, based upon the deliberations of its four scientific committees, established six working groups. The working groups concern (1) the Okhotsk Sea and Oyashio region; (2) development of common assessment methodology for marine pollution; (3) dynamics of small pelagic species in coastal ecosystems; (4) data collection and quality control; (5) the Bering Sea; and (6) the sub-arctic gyre.

The working groups will initiate their work by correspondence and are scheduled to meet prior to the second annual meeting of the organization, to be held in Seattle, Washington, on 20-25 October 1993. At the 1993 meetings, the scientific focus will be on five issues: (1) ocean circulation and climate variability in the sub-arctic Pacific; (2) high-resolution paleoecological studies in the sub-arctic Pacific; (3) priority chemical and biological contaminants in the North Pacific ecosystem; (4) shifts in fish abundance and species dominance in coastal seas; and (5) long-term monitoring from platforms of opportunity.

North Pacific Universities Marine Mammal Research Consortium

Because of the possible relationship between fisheries and marine mammal population changes in the Bering Sea and Gulf of Alaska, certain segments of the commercial fishing industry have initiated a program to support research in this area. This has led to establishment of the North Pacific Universities Marine Mammal Research Consortium, which includes the Universities of Oregon, Washington,

British Columbia, and Alaska. The administrative office of the Consortium has been set up at the University of British Columbia.

The purpose of the Consortium is to conduct, within the universities, a program of research on North Pacific marine mammals that will address issues relevant to fisheries management and complement work being done by government agencies. The initial focus will be on Steller sea lions. Funding for the studies will come primarily from the fishing industry, but other possible sources within academia and government are being investigated.

A Research Committee and a Management Committee have been established to help carry out the Consortium's program. Each includes a membership comprised of representatives of the fishing industry, the involved universities, and state and Federal agencies, and both committees have met several times. At a 27 November 1992 meeting of the Management Committee, a five-year research plan was presented and discussed. The planning is currently being revised and is expected to be approved early in 1993.

National Academy of Sciences Study

As noted earlier, the cause or causes of the marine mammal and seabird declines in the Bering Sea and Gulf of Alaska are unknown, but may be due to decreased food availability caused by fishing, natural environmental change, or both. There are conflicting views as to whether fisheries should be restricted until the causes of the declines have been determined, and how the uncertainties can best be resolved.

To identify the most prudent and scientifically defensible course of action, the Department of State provided funds to the National Academy of Science's Polar Research Board to undertake a comprehensive review and evaluation of information concerning the Bering Sea ecosystem. At the end of 1992, the Polar Research Board was constituting an *ad hoc* committee to undertake the review. The Committee will include experts in oceanography, fisheries biology and management, marine mammals, seabirds, socio-economics, and marine policy.

The Committee is to provide an independent assessment of the factors that may be responsible for observed changes in marine mammals, seabirds, and other components of the Bering Sea ecosystem and to recommend actions necessary to resolve the uncertainties. The Committee also is to provide an assessment of possible alternative regimes for conserving fishery and other marine living resources in the Bering Sea.

The Marine Mammal Commission and its Committee of Scientific Advisors will provide the National Academy of Sciences such assistance as it may request.

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 and to negotiate additional agreements required to achieve the purposes of the Act. In addition, section 202 of the Act directs that the Marine Mammal Commission recommend to the Secretary of State and other Federal officials appropriate policies regarding international arrangements for protecting and conserving marine mammals.

The Commission's activities in 1992 with respect to cooperation concerning marine mammal conservation are discussed below. During 1992, the Commission made substantial progress towards completing the compendium of international treaties and agreements bearing on the conservation of marine wildlife. In addition, the Commission continued to devote attention to providing advice on U.S. positions regarding the International Whaling Commission, addressing the impacts of large-scale high seas driftnet fisheries, and conserving and protecting marine mammals in the Southern Ocean.

Compendium of Treaties, International Agreements, and Other Relevant Documents

In October 1977, the Congressional Research Service prepared a compendium for the Senate Committee on Commerce, Science and Transportation entitled "Treaties and Other International Agreements on Fisheries, Oceanographic Resources, and Wildlife Involving the United States." The 1,250-page compendium included the texts of multilateral and bilateral treaties and agreements concerning Antarctica, wildlife conservation, fisheries, marine pollution, marine mammals, the law of the sea, and certain other topics. Its contents were limited to agreements to which the United States was a party as of the end of 1976. The compendium has never been updated.

There is a clear need for easy access to documents defining United States' obligations in support of international programs concerning marine mammals and other wildlife, ocean conservation and resource management, environmental protection, and related issues. Recognizing this, in 1992 the Marine Mammal Commission undertook to compile treaties, international agreements, and other relevant documents in these and related fields in order to update and expand upon the 1977 compendium.

For this purpose, in April 1992 the Commission convened an advisory board to help determine the content and format of the compendium. The advisory board is composed of professionals in the fields of international natural resource law, policy, and management. It includes, among others, representatives of Federal agencies, academic institutions, law firms specializing in international and natural resource law, international legal organizations, and conservation organizations. The board also includes persons involved in production of the 1977 compendium. Among other things, the advisory board helped to define the scope of the compendium, complete a table of contents, and develop a format that would be most useful for both students and professionals in the relevant fields.

Collection of documents was begun in mid-1991 and continued through mid-1992. Although the compendium focuses primarily on marine-related agreements, it also will include a large number of

other pertinent agreements as well as some treaties and agreements that are no longer in force but which are historically significant. Similarly, certain multilateral treaties and agreements to which the United States is not a party will also be included because of their overall importance. Current amendments and protocols to treaties and agreements will be included as well.

Texts of many of the treaties and agreements have been provided to the Commission by a number of Federal agencies, including the Department of State's Office of Treaty Affairs and Bureau of Oceans and International Environmental and Scientific Affairs; the National Marine Fisheries Service; the Library of Congress; the Fish and Wildlife Service; the International Trade Commission; and the Environmental Protection Agency. Other documents have been provided by international organizations, including the United Nations Environment Program; the United Nations Treaty and Legal Offices; the Food and Agriculture Organization of the United Nations; the Intergovernmental Oceanographic Commission; and the International Maritime Organization. The American Society of International Law has provided a number of multilateral documents to which the United States is not a party, and secretariats for several multilateral agreements contributed copies of their documents as well.

The compendium will be divided into two sections: (1) multilateral treaties and agreements and (2) bilateral agreements involving the United States. Subject areas include Antarctic research and conservation; general environmental and natural resource conservation and management; fisheries; marine mammals; marine pollution; marine science and exploration; and other related topics, such as trade and arms control. The compendium's bilateral section will include U.S. agreements with 30 other nations. In all, more than 100 multilateral treaties and agreements and more than 75 bilateral agreements will be included. With the inclusion of amendments and protocols, the compendium will contain more than 375 documents.

In addition to the texts of the treaties, agreements, and their amendments and protocols, the compendium will identify basic background data for each document, including the city in which the original text was signed, the date of its adoption, the date of its entry into force, the signatory nation or intergovernmental organization designated as its depositary, and primary source citations.

Final modifications to the compendium were begun in October 1992 and will continue through January 1993. The final text is expected to be completed by mid-March; the compendium will be published by the Government Printing Office shortly thereafter.

Support for this project has been provided primarily by the Department of State's Bureau of Oceans and International Scientific and Environmental Affairs. Support was also received from the National Marine Fisheries Service and the Fish and Wildlife Service.

International Whaling Commission

During 1992 the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, continued to review and to provide advice to the U.S. Commissioner to the International Whaling Commission (IWC) on measures necessary to ensure that commercial whaling, should it be resumed, not cause any whale stock to be reduced or maintained below its optimum sustainable level. Representatives of the Marine Mammal Commission and its Committee of Scientific Advisors participated in meetings of the IWC and its Scientific Committee and worked with the U.S. Commissioner to the IWC, the Department of State, and others to identify and undertake needed assessments and other actions. Such activities taking place before, during, and after the 1992 annual meeting of the IWC are discussed below.

Preparation for the 1992 IWC Meeting

As noted in its previous report, the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, undertook a comprehensive review of the International Whaling Convention and the IWC's conservation program in 1991. The results of that review were conveyed by letter of 5 December 1991 to the U.S. Commissioner to the IWC. In the letter the Commission noted that the IWC was at a critical stage in its history and that, while cetacean

conservation likely would be best served in the foreseeable future by maintaining the IWC, both the 1946 International Convention for the Regulation of Whaling and the IWC's Conservation Program were outdated and in need of fundamental revision. With regard to the last point, the Commission pointed out that the Whaling Convention fails to recognize that whales have non-consumptive (*e.g.*, aesthetic) values, that exploited whale populations may be affected by activities other than whaling (*e.g.*, by environmental pollution and incidental take in driftnet fisheries), or that the exploitation of whales may affect other components of the ecosystem of which they are a part.

The Commission also pointed out that the Revised Management Procedure, adopted in principle by the IWC in 1991, is based upon traditional single-species, maximum sustainable yield concepts, and by itself provides no assurance that commercial whaling, if allowed, would not result in serious over-exploitation and depletion of whale stocks as has occurred under all previous management procedures employed by the IWC. For example, while the Revised Management Procedure would provide a means of estimating biologically acceptable catch levels, additional measures would be needed to ensure that authorized catch levels are not exceeded and to verify that the affected stocks are not reduced or maintained below their maximum net productivity level.

The Commission urged that no consideration be given to lifting the moratorium on commercial whaling begun in 1986 until, at a minimum, (1) ongoing or planned research and monitoring programs are adequate to verify that exploited populations remain within their optimum sustainable ranges; (2) it is agreed that no take will be allowed from depleted stocks; (3) authorized catch levels, by themselves and in conjunction with other human activities or natural events, do not result in declines that, in turn, may cause population depletions before they can be detected by existing monitoring programs; (4) reporting, enforcement, and monitoring programs necessary to verify compliance with and effectiveness of the conservation program have received the full support and participation of all countries whose nationals engage in commercial whaling; and (5) authorized catch levels, in conjunction with other human activities, will not cause changes in the structure or functioning of the ecosystems of which the exploited species are a part.

The Commission recommended, among other things, that the United States (1) take the position that the non-consumptive values of whales may be equal to if not greater than their consumptive values and that science alone should not dictate the resumption of commercial whaling; (2) oppose the resumption of commercial whaling on the basis of previous failures to effectively conserve exploited stocks and to consider non-consumptive as well as consumptive values; (3) recognize that resumption of commercial whaling under a conservative management program (*e.g.*, appropriately conservative quotas, reliable reporting and effective inspection and enforcement, and effective population monitoring) would not jeopardize the affected whale stocks or the ecosystems of which they are a part; and (4) advise other members that if a three-fourths majority of the IWC members agree to resumption of commercial whaling under an appropriately conservative and effectively enforced management regime, the United States would not view such a resumption as "diminishing the effectiveness" of the IWC conservation program and would not apply or seek to have other nations apply sanctions against the countries that resume whaling.

The Commission also recommended that the National Oceanic and Atmospheric Administration develop and propose revisions to the International Whaling Convention and to the IWC Schedule of Regulations to formally establish the IWC's competence to regulate directed catches of small as well as large cetaceans.

Assessment of the Revised Management Procedure — At its 1991 meeting, the IWC adopted in principle a procedure recommended by its Scientific Committee for estimating single-stock catch levels. Under most circumstances, the procedure would (1) prevent the exploited stock from being reduced below 72 percent of its carrying capacity or pre-exploitation size; (2) reduce allowable catch levels to permit rebuilding if an exploited stock falls below 72 percent of its carrying capacity size; and (3) establish zero catch levels for stocks below 54 percent of their carrying capacity size. During consideration of the procedure, several uncertainties were noted. It was

noted, for example, that under certain circumstances the recommended procedure might inadvertently allow taking of stocks below the full protection level (*i.e.*, below 54 percent of the pre-exploitation or carrying capacity level), and that certain minimum data and survey standards may be necessary in order to be confident that the calculated allowable catch levels are appropriate to meet the management objectives. The IWC therefore requested that the Scientific Committee "consider and provide further advice on the minimum standards for data, including coverage and methodology for sighting surveys, analytical techniques and acceptable levels of precision."

In response to this request, the IWC Scientific Committee held a special meeting in Copenhagen, Denmark, on 2-6 March 1992. To help prepare for the meeting, a workshop was held on 24-29 February 1992 to further assess aspects of the recommended procedure for estimating single-stock catch limits. Regarding the possibility that taking might inadvertently be permitted from stocks that should be fully protected, the Scientific Committee conducted additional computer simulations. Based on its findings, it concluded that, while there was a high probability of allowing taking from depleted stocks if the growth rate is low, the catches allowed would be so small that they would have little effect on the population's recovery rate.

With respect to data requirements, the IWC Scientific Committee noted that the recommended procedure for estimating allowable catch levels requires only two data inputs — an absolute abundance estimate and an accurate record of past catches. The Scientific Committee noted that the procedure also includes rules that first reduce catch if the abundance estimate has a high coefficient of variation and second begin to phase out catches when a specified time has passed without a new population survey. With respect to the last point, the Scientific Committee noted it had been unable to agree on an appropriate time interval.

Formation of the North Atlantic Marine Mammal Commission — At the 1991 IWC meeting, the Icelandic Commissioner expressed frustration at the IWC's failure to finalize an agreed management procedure and to authorize the take of minke whales in the North Atlantic Ocean. He indicated that he would propose to his Government that Iceland withdraw from the International Whaling Convention. By letter of 27 December 1991, the Government of Iceland notified the United States, in its role as depositary government for the Convention, that it intended to withdraw from the Convention, effective 30 June 1992. Subsequently, the Governments of Iceland, Greenland, Norway, and the Faroe Islands entered into an "Agreement on Research, Conservation and Management of Marine Mammals in the North Atlantic."

The Agreement, which was signed by the fisheries ministers from each government in April and entered into force in July 1992, established an international organization, the North Atlantic Marine Mammal Commission. The objective of the Commission, as set forth in Article II of the Agreement, is to "contribute through regional consultation and cooperation to the conservation, rational management and study of marine mammals [seals and small cetaceans, as well as whales] in the North Atlantic." The Commission includes a governing council, management committees, a scientific committee, and a secretariat. The first meeting of the Governing Council was held on 10-11 September 1992. At the meeting, the Council agreed to continue relations with the International Council for the Exploration of the Sea (ICES) and the IWC and to seek reciprocal observer status with these and other relevant fisheries organizations. Canada and Russia were invited to join the Commission as members. One intent clearly is to bring pressure on the IWC to authorize resumption of commercial whaling and, failing this, to establish a new and independent organization of like-minded countries to govern exploitation of marine mammals, including whales, in the North Atlantic.

At the September meeting, the Governing Council also requested that the International Council for the Exploration of the Seas conduct a review of the status of the long-finned pilot whale in the North Atlantic Ocean. This species is the subject of a controversial drive fishery in the Faroe Islands and is caught incidentally in a number of fisheries in the North Atlantic. ICES has agreed to conduct the review.

House Concurrent Resolution 177 — On 19 May 1992, the U.S. House of Representatives adopted a

resolution concerning the IWC. The resolution expressed the sense of Congress that:

"(1) United States policy should promote the conservation and protection of whale, dolphin, and porpoise populations;

"(2) toward that goal, the United States should work to strengthen and maintain an International Whaling Commission moratorium on the commercial killing of whales, and work toward a similar moratorium on the direct commercial harvest of dolphins and porpoises;

"(3) the United States should work to strengthen the International Whaling Commission by reaffirming its competence to regulate direct commercial whaling on all cetaceans, and should encourage the Commission to utilize the expertise of its Scientific Committee by seriously considering the Committee's recommendations; and

"(4) in so promoting the conservation and protection of the world's whale populations, the United States should make the fullest use of diplomatic channels, appropriate domestic and international law, and all other means available."

Follow-up to the Marine Mammal Commission's Letter of 5 December 1991 — As noted above, in 1991 the Marine Mammal Commission and its Committee of Scientific Advisors undertook a comprehensive review of the 1946 Whaling Convention and the IWC's Conservation Program and conveyed the results of the review to the U.S. Commissioner to the IWC on 5 December 1991. To seek the views of others on the Commission's assessments and recommendations, the U.S. Commissioner published the Commission's letter and related background information in the *Federal Register* on 6 February 1992. Comments were requested by 6 April 1992.

From some of the comments received, it was evident that the intent of and the rationale for some of the Commission's recommendations had not been set forth clearly in the Commission's 5 December 1991 letter. In particular, there seemed to be confusion as to what the Commission meant when it recommended (1) that the United States adopt the position that the non-consumptive values of whales may be equal to if not greater than their consumptive values and that "science" alone *(e.g.*, the status of the potentially affected whale stocks) should not necessarily dictate the resumption of commercial whaling; and (2) that consideration be given to revising the 1946 Whaling Convention to incorporate more up-to-date principles of marine living resource conservation and to resolve uncertainties concerning the IWC's authority to overview and regulate taking of small cetaceans. Therefore by letter of 9 June 1992 to the U.S. Commissioner, the Commission clarified and expanded upon the recommendations set forth in its letter of 5 December 1991.

With respect to the point that the status of whale stocks alone should not dictate resumption of commercial whaling, the Commission noted that many scientists and policy makers seemed to be of the view that there was no legitimate basis for the United States to oppose resumption of commercial whaling if the comprehensive assessment being done by the IWC's Scientific Committee indicated that one or more whale stocks were above their maximum net productivity level and the means were available to ensure that exploitation would not cause the stocks to be reduced below that level.

The Marine Mammal Commission does not believe that this view is justified. It pointed out that if factors other than the status of stocks — *e.g.*, ecological, basic research, educational and/or aesthetic considerations — have a bearing on the optimal levels and use (*i.e.*, conservation) of cetaceans, there is no reason why the United States or any other member of the IWC necessarily should agree to the resumption of commercial whaling even if the comprehensive assessment being done by the IWC's Scientific Committee indicates that some level of whaling could be allowed without causing the affected stocks to be reduced below their maximum net productivity level.

In this context, the Commission pointed out that Section 2(6) of the Marine Mammal Protection Act notes that "marine mammals have proven themselves to be resources of great international significance, aesthetic and recreational, as well as economic...and that the primary objective of their management should be to maintain the health and stability of the marine

ecosystem." The Commission also pointed out that the legislative history of the Act, the recent Congressional resolution noted earlier, and continuing public interest in issues bearing upon the conservation and protection of marine mammals indicate that the majority of Congress and the American public oppose killing marine mammals for commercial purposes. In this regard, the Commission noted that public interest in marine mammals is further illustrated by the millions of people who go on whale-watching expeditions and visit public display facilities each year and by the volume of letters to the Congress and government officials opposing killing of marine mammals.

As noted earlier, the Marine Mammal Commission also had recommended in its 5 December 1991 letter that efforts be undertaken to update the 1946 Whaling Convention. This recommendation was based upon a determination that, while the Convention no doubt reflected current thinking when it was concluded in 1946, there has been substantial evolution in the basic principles and concepts underlying marine living resource conservation since then. It now is recognized, for example, that living resources may have non-consumptive as well as consumptive values and that individual species and populations affect and are affected by one another and other components of the ecosystems of which they are a part. It also is recognized that whale stocks may be affected, both directly and indirectly, by a variety of activities in addition to commercial exploitation.

In this context, the 9 June letter indicated that the Commission, in consultation with its Committee of Scientific Advisors, had carefully reviewed the report of the special meeting of the IWC's Scientific Committee held in Copenhagen, Denmark, on 2-6 March 1992. The Commission noted that the meeting report indicated that substantial progress had been made with regard to the Revised Management Procedure and that the procedure, as it was evolving, could provide an adequate basis for ensuring that commercial whaling does not have significant adverse effects on either the affected whale stocks or the ecosystems of which they are a part. The Commission noted, however, that a number of critical uncertainties remain. It is not clear, for example, whether the intervals between required population surveys and the precision of the surveys will be such that the Revised Management Procedure will be sensitive to possible ecological effects and lead to appropriate management decisions if there are significant decreases in habitat or habitat carrying capacity, or if the productivity of whale stocks is affected by extrinsic factors, such as environmental pollution. To help resolve these uncertainties, the Commission recommended that studies be done to determine the sensitivity of the Revised Management Procedure to the precision of the input parameters, including the precision and frequency of abundance estimates.

As noted earlier, the Commission's 5 December 1991 letter also recommended that steps be taken to formally recognize the IWC's competence to regulate deliberate catches of small cetaceans as well as large cetaceans. Many of the organizations and individuals that commented on the Commission's 5 December 1991 letter questioned or opposed this recommendation. While recognizing that a number of the expressed concerns were valid, the Commission pointed out in its 9 June 1992 letter that many species and populations of small cetaceans are in greater trouble than most species and populations of large cetaceans and that some species and populations of small cetaceans are likely to be driven to extinction if remedial measures are not taken quickly.

The Commission also pointed out that the IWC's Scientific Committee is uniquely qualified to review and to provide advice on matters affecting the conservation of both large and small cetaceans. The Commission expressed the view that, minimally, the IWC should be encouraged to continue using its Scientific Committee to review and provide advice on all issues bearing upon the conservation of both large and small cetaceans. The Commission also expressed the view that countries with interests in and responsibilities for conservation of small cetaceans as well as large cetaceans should be encouraged to join the IWC.

The 1992 Meetings of the International Whaling Commission and its Scientific Committee

The 44th annual meeting of the IWC was held in Glasgow, Scotland, 29 June-3 July 1992. Working groups met on 24-29 June, and the Commission's

Scientific Committee met the two preceding weeks (9-22 June) to consider and provide advice on issues as requested by the Commission. The results of these meetings are summarized below.

The Revised Management Procedure — The IWC and its Scientific Committee considered a number of issues regarding refinement and use of the catch limit algorithm adopted in principle in 1991 to calculate acceptable catch levels. The issues included the possibility of whaling being allowed when stocks are significantly below the full protection level (54 percent of the carrying capacity level) and specification of minimum data requirements and rules for setting catch limits.

Some members of the IWC believed that the basic procedure for setting catch limits had been evaluated sufficiently and that available abundance and catch data were sufficient for some stocks *(e.g.*, the southern hemisphere and North Atlantic minke whale populations) to begin calculating and setting allowable catch limits. Others believed that further evaluation was necessary to identify minimum data requirements and that it would be premature to begin calculating or establishing catch limits until agreement had been reached on other related matters — *e.g.*, catch reporting and verification (inspection) requirements and minimum standards for the precision and frequency of population surveys. The IWC adopted a resolution recognizing that the Scientific Committee had developed and satisfactorily specified a procedure for calculating catch limits for baleen whales, but that agreement on additional issues would be required before resumption of commercial whaling might be considered. The full set of agreements, referred to as "The Revised Management Scheme," would require (1) agreement on minimum data standards; (2) guidelines for conducting population surveys and analyzing the results; (3) a fully effective inspection and observation scheme; (4) arrangements to ensure that the total catches over time are within the limit set under the Revised Management Procedure; and (5) incorporation of the draft specification and the other elements of the Revised Management Scheme into the IWC's Schedule of Regulations.

The resolution reaffirmed that commercial whaling should be permitted only for populations, areas, and seasons for which catch limits have been calculated by the Scientific Committee, and that recommendations for catch limits should be forwarded to and approved by the IWC in conformity with all the provisions of the Revised Management Scheme. The resolution also indicated that catch limits should not be calculated until all aspects of the Revised Management Scheme have been elaborated.

Whale Sanctuaries — In 1979 the International Whaling Commission prohibited all forms of commercial whaling in a region designated as the Indian Ocean Sanctuary. This prohibition was scheduled to expire on 24 October 1992. Prior to the 1992 IWC meeting, the Seychelles proposed that the prohibition be extended indefinitely. Japan and others opposed such an extension. At its 1992 meeting the IWC agreed that the prohibition would be continued but would be reviewed again in 2002.

The IWC also considered a proposal by the Government of France to designate all the waters of the southern hemisphere south of 40° south latitude as a sanctuary where commercial whaling would be prohibited. A number of technical and legal issues were noted during discussion of the proposal. It was noted, for example, that the Commission for the Conservation of Antarctic Marine Living Resources and the Scientific Committee on Antarctic Research should be consulted before any action was taken. The IWC asked its Scientific Committee to consider and provide advice on the scientific merits of the proposal for consideration at its 1993 meeting. The IWC also asked that the Secretariat invite the Commission for the Conservation of Antarctic Marine Living Resources, the Scientific Committee for Antarctic Research, and other organizations to provide comments on scientific matters raised in the proposal. It agreed to give full consideration to the proposal at its 1993 meeting.

Aboriginal/Subsistence Whaling — The IWC's Schedule of Regulations includes catch limits for aboriginal subsistence whaling. During its 1991 meeting, the IWC took the following actions regarding aboriginal/subsistence whaling:

- *Bering-Chukchi-Beaufort Seas stock of bowhead whales (taken by Alaska Natives and in 1991 by Canadian Natives)* — At its 1991 meeting the

IWC authorized a three-year total of 141 strikes of bowhead whales for the years 1992, 1993, and 1994 with no more than 54 whales struck and no more than 41 landed in any one year, and a maximum of 13 unused strikes that may be carried over from the period 1989 to 1991. At the 1992 meeting, the United States provided information on a whaling community that had been overlooked in previous analyses of subsistence and cultural needs. It indicated that one whale per year was needed to meet the subsistence and cultural requirements of this community. It did not, however, propose to increase the authorized catch limit in 1992. Thus, the catch limits adopted in 1992 remain in effect.

- *Eastern North Pacific Gray Whales (taken for Siberian Eskimos)* — A commercial whaling vessel is used to take and deliver gray whales to Russian Eskimos. In 1991 the IWC established a catch limit of 169 whales a year for 1992, 1993, and 1994. No information on the numbers or characteristics of whales taken, methods of killing, distribution of the meat, or biological data were received from the Russian Federation for the 1991 season. The Russian Federation representative indicated that technical reasons associated with internal reorganization were responsible for the lack of information.

- *North Atlantic West Greenland Stock of Fin Whales (taken by Greenland)* — Denmark, on behalf of Greenland, proposed that the catch limit of 21 animals set for 1992 be continued in 1993 and 1994. This limit was adopted.

- *North Atlantic Central Stock of Minke Whales (taken by Greenland)* — In 1991 the IWC authorized 315 total strikes of minke whales for the years 1992, 1993, and 1994 with no more than 115 whales struck in any one year. No new information was provided and the authorized catch limits were not changed in 1992.

- *East Greenland Minke Whales (taken by Greenland)* — The catch limits for this stock were 12 whales each for the years 1990, 1991, and 1992. The IWC agreed to Denmark's proposal to continue these catch limits for 1993 and 1994.

- *Northwest Atlantic Humpback Whales (taken by St. Vincent and the Grenadines)* — In 1990 the IWC adopted a catch limit of three whales each year from this stock for the 1990-1991, 1991-1992, and 1992-1993 seasons.

Small-Type Coastal Whaling — Japan has repeatedly argued that many of its small coastal communities depend upon whales and whaling in ways that are little different from aboriginal subsistence whaling. Documentation presented to a working group that met before the IWC's 1992 annual meeting indicated that small-type whaling in Japan is a limited access fishery, involving four coastal communities and 7-9 boats. The harvest level between 1951 and 1986, when the moratorium on commercial whaling entered into effect, was approximately 350 whales a year. Pending final adoption and implementation of the Revised Management Procedure, Japan requested that the IWC authorize "a symbolic emergency relief quota of 50 minke whales" for its coastal whaling villages. A number of members, including the United States, noted that the "small-type" coastal whaling operations cannot be distinguished in any valid way from commercial operations. The IWC refused to authorize the requested take of 50 minke whales. It agreed, however, to consider the matter further in 1993.

Special Permits for Scientific Research Whaling — The International Whaling Convention allows member nations to issue permits authorizing the take of whales for scientific purposes, provided that the proposed research programs are provided to the IWC's Scientific Committee for review and comment before the permits are issued. The IWC, acting on advice provided by its Scientific Committee, has adopted guidelines for judging whether proposed takes for scientific purposes will contribute to making determinations necessary to further the IWC's conservation program.

At their 1992 meetings the IWC and its Scientific Committee considered permits proposed to be issued by Japan and Norway to allow taking of minke whales in the Antarctic and the North Atlantic Oceans, respectively, for purposes of scientific research. The Japanese program would involve the take of 300 animals $\pm 10\%$ in Antarctic Statistical Area V; the Norwegian program would authorize the take of 110

minke whales in 1992 and 136 whales in both 1993 and 1994 in the northeastern Atlantic. The objective of the Japanese research is to obtain better estimates of the discreteness and productivity of southern hemisphere minke whale stocks. The objective of the Norwegian research is to obtain better information on the feeding ecology of minke whales for use in a multi-species fisheries management model for the northeastern Atlantic.

The Scientific Committee advised the IWC that neither program would contribute significantly to the comprehensive assessment of whale stocks. The IWC adopted resolutions asking both countries to reconsider their research whaling programs. These resolutions are non-binding, and both countries have issued permits authorizing the research (see below for further discussion of this issue).

Small Cetaceans — As noted above, many species and populations of small cetaceans have been seriously depleted by directed taking and other human activities. The International Whaling Convention neither lists nor defines the species it was created to conserve. Consequently, there has been extensive debate over the IWC's competence to regulate catches of small cetaceans, particularly as such regulation would relate to the rights of coastal states to regulate small cetacean catches within their respective Exclusive Economic Zones.

The IWC has recognized that many species and populations of small cetaceans are in serious trouble. In 1980, it adopted a resolution that (1) noted that the question of the IWC's competence over small cetaceans was not resolved; (2) recommended that the Scientific Committee continue to consider and to provide advice to contracting governments and others on measures necessary to effectively conserve species and populations of small cetaceans; and (3) invited all contracting governments to consider the advice provided by the Scientific Committee.

At its 1992 meeting the Scientific Committee reviewed information and provided management advice on white whales (also called beluga whales) and narwhals throughout the Arctic, on dolphin stocks harvested by Japanese drive fisheries, and on harbor porpoise taken incidentally in finfish fisheries in the northern Gulf of Maine and the lower Bay of Fundy. With respect to white whales, the Scientific Committee noted that there is insufficient knowledge of stock identification and stock boundaries throughout the species' range. It also noted that the abundance of white whales wintering in west Greenland had declined since the 1980s and that catches from this stock by Greenland and Canada have not been sustainable. It recommended that additional studies be done to better determine the size and discreteness of various populations and that the hunting level of the Baffin Bay stock be reduced.

With respect to Japanese drive fisheries, the Scientific Committee recommended that an assessment of the striped dolphin population affected by the fishery be done as a matter of urgency, and pending completion of this assessment, that all directed catches of this species be stopped. With respect to harbor porpoises, the Scientific Committee noted that the bycatch in U.S. and Canadian gillnet fisheries should be reduced and that information on incidental capture was lacking for some countries. It recommended that all countries implement a recording scheme for incidental takes of harbor porpoise in their waters and provide the data to the IWC.

Three topics for priority consideration at future meetings were also identified. They are (1) a review of the abundance and exploitation of small cetaceans in South American coastal and riverine waters, particularly species used for bait in Chilean crab fisheries; (2) a review of the status of small cetacean species taken incidentally in coastal fisheries in southeast Asia and the Indo-Malay region; and (3) a general review of the status of dolphins of the genus *Lagenorhynchus* taken incidentally in driftnet and other fisheries in the North Pacific.

Humane Killing — As noted in the Marine Mammal Commission's previous annual report, the IWC adopted a resolution at its 1991 meeting calling for a workshop to review progress made since 1980 when the last comprehensive review was done, on developing humane methods for killing whales. In response to this resolution, a three-day Workshop on Whale Killing Methods was organized and held prior to the IWC's 1992 annual meeting. The workshop concluded that there had been little progress and that there

were insufficient data to accurately assess the efficiency of killing methods that have been and are being used or how the methods might be improved. The workshop developed and recommended an 11-point plan to further assess and develop more humane killing methods. The IWC endorsed the action plan and called upon its members to implement it.

Closing Statements — At the end of the meeting, both Norway and Japan indicated disappointment that the IWC had been unable to finalize and use the Revised Management Procedure to establish allowable catch limits for North Atlantic and southern hemisphere minke whale stocks. Norway indicated that it must consider whether it will continue as a contracting government to the Convention.

Post-Meeting Activities

Certification of Norway — The United States considers failure of nations to follow IWC resolutions calling for reconsideration of "research" whaling to be grounds for certification under two provisions of domestic law — the Packwood-Magnuson Amendment to the Magnuson Fishery Conservation and Management Act and the Pelly Amendment to the Fishermen's Protective Act. Certification under the Packwood-Magnuson Amendment mandates an immediate 50 percent reduction in the offending nation's fishery allocation from U.S. waters. Under the Pelly Amendment, the President has the discretion to impose economic sanctions by restricting imports of fish and fish products into the United States from the certified nation.

As noted above, the IWC determined that the research programs being carried out by Norway and Japan are not necessary to further the IWC's conservation program and requested that both countries reconsider issuing permits authorizing "research" whaling. Neither country refrained from issuing permits authorizing research whaling. During the summer of 1992, 95 minke whales were killed in the course of the Norwegian scientific research program. By letter of 26 October 1992 the Secretary of Commerce advised the Marine Mammal Commission that she had certified to the President that nationals of Norway were conducting whaling operations that diminish the effectiveness of the IWC's conservation program and that the Department of Commerce was developing trade recommendations on possible import prohibitions to be forwarded to the President.

On 23 December 1992 the President advised Congress that he had decided not to impose sanctions at this time. However, the President also stated that the U.S. concerns over Norway's proposed plans for commercial whaling in 1993 would be conveyed to the highest levels of the Norwegian Government.

Japan remains certified under both the Pelly and Packwood-Magnuson Amendments pursuant to a decision by the Department of Commerce's in 1988.

Russian aboriginal take of bowhead whales — As noted in Chapter III, in December 1992 the Secretary of the IWC was advised that the Russian Federal Fisheries Commission had authorized residents of the Chukotskiy Peninsula to take three bowhead whales during November-December 1992. As of the end of 1992 neither the IWC nor the United States had been advised as to whether any bowhead whales had been taken.

High Seas Driftnet Fisheries

During the past 15 years there has been an explosive growth in driftnet fisheries on the high seas of certain oceans. Made possible by the development of strong, lightweight monofilament nets, high seas driftnet fisheries apply centuries-old freshwater and coastal gillnet fishing techniques, but on a vastly larger scale in the open ocean and with potentially disastrous results.

High seas (or pelagic) driftnets are usually suspended from a float line at or near the ocean surface and hang to a depth of about 10 meters. Driftnets are not selective, and when any marine organisms larger than the mesh size attempt to swim through a net, they become entangled in the webbing. In large-scale operations, 30- to 60-meter segments of gillnet are strung together to form net curtains often stretching six to 13 kilometers in length. Each night, individual vessels may deploy several of these units, which combined may total as much as 60 kilometers of net.

The nets are usually set in the evening and retrieved the next morning.

Large-scale driftnet fishing in the North Pacific Ocean began late in the 1970s. With little or no management authority governing their operation in international waters, driftnet fishing expanded rapidly into high seas areas. By the mid-1980s more than 800 vessels from Japan, Taiwan, and the Republic of Korea were licensed to engage in driftnet fishing in the North Pacific Ocean. Together, they deployed as much as 40,000 kilometers of net nightly.

The principal target species of driftnet fisheries in the North Pacific Ocean include salmon, neon flying squid, albacore and skipjack tuna, and billfish. The incidental catch includes millions of finfish, sharks, seabirds, turtles, and marine mammals. Species of marine mammals taken include the northern right whale dolphin, Dall's porpoise, Pacific white-sided dolphin, common dolphin, striped dolphin, spotted dolphin, false killer whale, pilot whale, Cuvier's beaked whale, minke whale, sperm whale, northern fur seal, and northern elephant seal.

As the indiscriminate nature and great magnitude of the unregulated catch became apparent in the 1980s, they gave rise to global concern over the wastefulness of driftnets and their effect on marine species. Not only were the driftnet fisheries catching highly migratory species of commercially valuable fish being taken by fisheries using other gear types, they also were incidentally taking large numbers of many other species. These included some species that spend part of their life cycles in coastal areas as significant seasonal components of coastal marine ecosystems. Given the number of individual animals of many different species being taken, the Marine Mammal Commission and others expressed grave concern about the overall effect of driftnet fisheries on the fundamental structure of marine ecosystems.

By the late 1980s forays by driftnet vessels into the South Pacific, Atlantic, and Indian Oceans presaged an impending global expansion of driftnet fishing operations. However, as discussed below, concerted international actions have been taken to prevent their spread into new high seas areas and to phase out the practice indefinitely in high seas areas where they now occur.

U.S. Agreements with Fishing Nations

Concern over the effects of high seas driftnet fishing in the North Pacific Ocean led Congress to pass the Driftnet Impact Monitoring, Assessment, and Control Act of 1987. The Act called upon the Department of Commerce, through the Department of State, to negotiate driftnet monitoring and enforcement agreements with driftnet fishing nations whose high seas fleets were taking marine resources of the United States. The Act specified that the monitoring agreements include, among other things, observer programs to collect data suitable for developing statistically reliable assessments of the numbers of U.S. species killed by each nation's driftnet fleet, and that the enforcement agreements include measures to avoid fishing in areas where salmon of U.S. origin were likely to be caught.

To assure international cooperation, the Act directed the Secretary of Commerce to certify any driftnet fishing nation failing to enter into or to implement adequate enforcement or monitoring agreements under the Pelly Amendment to the Fishermen's Protective Act. Such a certification constitutes a finding that a nation is diminishing the effectiveness of an international fisheries agreement and empowers the President to embargo some or all fishery products imported into the United States from that nation.

In response to the Act, separate driftnet monitoring and enforcement agreements were negotiated with Japan, Taiwan, and the Republic of Korea in 1989. Canada also was a party to the agreements with Japan. Under the agreement with Japan, a pilot observer program was implemented in 1989 for the Japanese squid driftnet fleet. Beginning in 1990 monitoring and enforcement programs with all three driftnet fishing nations were carried out. Specific program details, such as the number of observers, arrangements for data collection and analysis, and areas closed to driftnet fishing, were negotiated separately prior to each fishing season. The Marine Mammal Commission's comments to the Departments of Commerce and State on the monitoring programs are described in its previous annual reports. The agree-

ments with all three nations were to expire on 30 June 1992. Early in 1992, however, the enforcement agreements were extended through 31 December 1992 to conform with the starting date for a global moratorium on large-scale high seas driftnet fishing called for by United Nations General Assembly Resolution 46/215 (see discussion below).

Results of 1990 and 1991 Driftnet Monitoring Programs

Each driftnet monitoring agreement includes provisions to review and tabulate catch data collected by observers and to prepare a summary report following the fishing season. The reports, released six to

Table 11. Target and bycatch animals observed taken in a portion of the large-mesh driftnet fishing fleets of Japan (September 1990 to May 1991) and Taiwan (May to August 1991)

SPECIES	JAPAN[1] All Observer Data Number of Animals (829 Net Retrievals)	TAIWAN[2] U.S. Observer Data Number of Animals (229 Net Retrievals)
Skipjack tuna	252,918	4,473
Albacore tuna	39,424	35,680
Billfish	5,133	844
Neon flying squid	88,592	609
Pacific pomfret	277,458	4,515
Blue shark	7,692	6,827
Mahi mahi	59,863	568
Sooty shearwater	109	11
Laysan albatross	125	9
Striped dolphin	504	22
Common dolphin	480	323
Spotted dolphin	37	0
Bottlenose dolphin	15	1
Rough-toothed dolphin	18	0
Risso's dolphin	29	4
Northern right whale dolphin	0	0
Dall's porpoise	0	1
Unidentified dolphins	152	6
Pygmy sperm whale	20	4
Pygmy killer whale	17	4
False killer whale	7	3
Cuvier's beaked whale	6	3
Sperm whale	4	1
Northern fur seal	0	11
Loggerhead turtle	145	84

1. Int. North Pac. Fish. Comm. 1992. Final report of observations of the Japanese high seas large-mesh driftnet fishery in the North Pacific Ocean, 1990-1991. Joint report by the National Sections of Canada, Japan, and the United States. 86pp.

2. Joint report of the Council of Agriculture, Taiwan; the U.S. National Marine Fisheries Service; and the U.S. Fish and Wildlife Service. 1992. Final report of 1991 observations of the Taiwan high seas driftnet fisheries in the North Pacific Ocean. 98pp. (Due to inconsistencies in species identification and recording by U.S. and Taiwan observers, only U.S. observer data are provided here).

ten months after each fishing season, provide a summary of the numbers of each individual species counted by observers on the monitored portion of each respective driftnet fishery. Because the counts do not include unseen animals that drop out of nets dead during the retrieval process or that escape mortally injured while the net is deployed, the reported counts are lower than the actual catch by some unknown amount.

Tables 11 and 12 include data from the driftnet monitoring reports for the 1989 to 1991 fishing seasons. Table 11 includes results from the monitoring programs for the large-mesh driftnet fisheries of Japan and Taiwan for tuna and certain other large fishes in 1990 and 1991. Table 12 includes results from the monitoring programs for the squid driftnet fisheries of Japan, Taiwan, and the Republic of Korea. No monitoring programs were planned or carried out with any driftnet fishing nation in 1992 because of the actions calling for a halt in large-scale pelagic driftnet fishing initially after 30 June 1992, but later deferred until after 31 December 1992 (see discussion below).

Results from the 1990 and 1991 monitoring programs with Taiwan and the Republic of Korea were greatly compromised because of inconsistencies in data collection between observer teams from the United States and those from Taiwan and Korea, respectively. The problems arose because of the limited ability of non-U.S. observers to accurately identify many of the animals caught and a resulting difference in the way catch data were recorded. As a result, the authors of the reports considered it inappropriate to combine catch data collected by U.S. observers with that collected by observers from Taiwan or Korea and each is presented separately in monitoring reports. Because of the difficulties, only data collected by U.S. observers are presented in Tables 11 and 12.

The monitoring reports prepared under the agreements do not extrapolate results to the entire driftnet fleet of any nation. For example, reports on the 1989 and 1990 Japanese squid driftnet monitoring programs provide catch data only for that portion of Japan's squid driftnet fleet actually observed (about four percent and 12 percent, respectively). Neither do the monitoring reports combine or compare data with driftnet catch data from other fishing nations, nor do they include data on overall fleet driftnet fishing effort. As a result, they do not provide an overall assessment of the catch levels by driftnet fishing vessels for any target or bycatch species, and it is difficult to extrapolate results to do so.

Even in the absence of such analyses, however, the magnitude of the take reported by the monitoring programs clearly justifies fears that driftnet fishing poses a significant threat to stocks of many species and that it may well disrupt fundamental relationships among important components of pelagic as well as coastal ecosystems.

Data Evaluation

In the absence of reliable information on the catch and bycatch of driftnet fisheries in the North Pacific Ocean, the Driftnet Impact Monitoring, Assessment, and Control Act of 1987 required the development of driftnet monitoring programs capable of developing statistically reliable assessments of the numbers of each species killed by each nation's driftnet fleet. As discussed in previous annual reports, the Marine Mammal Commission provided advice to the Departments of Commerce and State to ensure that this provision was met.

To provide the most informed basis possible for addressing the issue internationally, the Commission also recommended on 26 October 1990 that the State Department and the National Marine Fisheries Service jointly assess the adequacy of available data on the catch of driftnet fisheries in the North Pacific Ocean and that a regional review by international experts of driftnet fishing impacts be held in the spring of 1991. Concerning the latter point, the Commission recommended that the review examine: (1) available at-sea sighting data; (2) the extent of the ranges of target and non-target species taken by driftnet fisheries; (3) the biological and population data related to those species; and (4) data and information on the impacts of driftnet fishing on affected stocks.

These points were subsequently addressed during an 11-14 June 1991 regional review of North Pacific Ocean driftnet fisheries hosted by the Canadian Department of Fisheries and Oceans in Sidney, British

Table 12. **Observed catch and bycatch by a portion of the squid driftnet fishing fleets of Japan in 1989, 1990, and 1991, of Taiwan in 1990 and 1991, and of the Republic of Korea in 1990 (reflecting catch only by vessels carrying observers)**

	OBSERVED NUMBERS OF INDIVIDUAL ANIMALS TAKEN					
	1989	1990			1991	
SPECIES	Japan[1] All observ. (1,402 net retrievals)	Japan[2] All observ. (2,879 net retrievals)	Taiwan[3] U.S. observ. (193 net retrievals)	R. of Korea[4] U.S. observ. (440 net retrievals)	Japan[5] U.S. observ. (2,659 net retrievals)	Taiwan[6] U.S. observ. (134 net retrievals)
Neon flying squid	3,119,061	7,939,252	1,088,731	2,330,763	3,709,123	362,744
Pacific pomfret	1,433,496	3,224,055	47,248	36,975	1,564,315	11,189
Blue shark	58,100	81,956	6,398	15,248	82,459	2,773
Albacore tuna	59,060	90,011	47,248	1,338	188,316	3,573
Skipjack tuna	7,155	162,631	36,338	20,664	40,989	18,169
Salmonid	79	9,729	1	65	2,599	9
Sooty/dark shearwater	8,438	26,787	85	407	17,611	260
Laysan albatross	331	840	29	50	580	49
Northern fur seal	208	545	0	1	385	20
N. right whale dolphin	455	840	7	39	939	0
Pacific white-sided dolphin	254	459	0	27	411	4
Dall's porpoise	141	318	1	18	311	4
Common dolphin	12	69	0	2	87	23
Striped dolphin	0	0	0	0	0	1
Unidentified dolphins	52	50	1	2	39	2
Leatherback sea turtle	9	27	0	2	24	7

1 Int. North Pac. Fish. Comm. 1990. Final report of the squid and bycatch observations in the Japanese driftnet fishery for neon flying squid (*Ommastrephes bartrami*) June-December, 1989 observer program. Joint Report by the National Sections of Canada, Japan and the United States. 111 pp.

2 Int. North Pac. Fish. Comm. 1991. Final report of 1990 observations of the Japanese high seas squid driftnet fishery in the North Pacific Ocean. Joint Report by the National Sections of Canada, Japan, and the United States. 198 pp.

3 Joint Report of Republic of China Council of Agriculture, U.S. National Marine Fisheries Service, and U.S. Fish and Wildlife Service. 1991. Final Report of 1990 observations of Taiwanese high seas driftnet fisheries in the North Pacific Ocean. 83 pp.

4 Joint Report of Republic of Korea National Fisheries Research and Development Agency, U.S. National Marine Fisheries Service, and U.S. Fish and Wildlife Service. 1991. Final Report 1990 observations of the Korean high seas squid driftnet fishery in the North Pacific Ocean. 75 pp.

5 Int. North Pac. Fish. Comm. 1992. Final Report, 1991 observations of the Japanese high seas squid driftnet fishery in the North Pacific Ocean. Joint Report by the National Sections of Canada, Japan, and the United States. 151 pp.

6 Joint Report of the Council of Agriculture, Taiwan, U.S. National Marine Fisheries Service, and U.S. Fish and Wildlife Service. 1992. Final Report of 1991 observations of the Taiwan high seas driftnet fisheries in the North Pacific Ocean. 98 pp.

Columbia, Canada. Although the review was held before results of the 1990 monitoring programs had been released, it remains one of the most comprehensive examinations of the effects of driftnet fisheries done to date. Representatives from Australia, Canada, Japan, Korea, Taiwan, and the United States participated in the meeting. Members of the Marine Mammal Commission's Committee of Scientific Advisors were among the U.S. participants.

During the review, Japanese participants presented estimates of the 1990 catch and bycatch for the entire Japanese squid driftnet fleet. For that fleet alone in 1990, the estimates included 106 million neon flying squid, 34 million pomfret, 2.8 million skipjack tuna, 799,000 albacore tuna, 141,000 salmon, 701,000 blue sharks, 4,700 billfish, 234,000 sooty and dark shearwaters, 9,000 Laysan albatross, 9,000 northern right whale dolphins, 5,000 northern fur seals, 4,000 Pacific white-sided dolphins, and 300 leatherback sea turtles. The meeting participants also concluded that the number of northern right whale dolphins had declined significantly because of the take in driftnets and that Pacific white-sided dolphins could experience serious declines if driftnet fishing continued unabated.

The limited information available at the time of the review precluded a more complete assessment of catch levels and effects on target and non-target species. Although a great deal of new information has been gathered since then, it has yet to be examined comprehensively. Even assuming large-scale high seas driftnet fishing ceases at the beginning of 1993, a thorough assessment and synthesis of the data remain an urgent need. Among other things, such a review is needed to better understand how these fisheries may have affected particular stocks and functional relationships among components of the North Pacific marine ecosystem, and to gain insight regarding the management of catch and bycatch in future high seas fishing. In anticipation of these needs, the Marine Mammal Commission has taken several preliminary steps.

Late in 1991 the Commission contracted for a study to determine the possible second-order effects of driftnet fisheries in the North Pacific Ocean. The purpose of the study is to review and assess how large-scale driftnet fisheries have affected the ecological structure and productivity of the North Pacific Ocean environment and to identify steps that should be taken prior to and during the development of new high seas fisheries. At the end of 1992, the preliminary results of the study were under review. A final report is expected to be available in 1993.

In addition, during the course of preparing advice to the National Marine Fisheries Service on the driftnet monitoring programs with Japan, Taiwan, and the Republic of Korea, the Marine Mammal Commission became concerned about the statistical tools being used to determine the level of observer effort. Therefore, in June 1991, the Marine Mammal Commission and the National Marine Fisheries Service entered into an agreement to allow a member of the Commission's Committee of Scientific Advisors access to the observer data collected during individual driftnet operations. Under the agreements with each nation, these data were not to be included in the summary reports and were to remain confidential.

In examining the data, it became apparent that the bycatch of certain marine mammals as well as other species were not evenly distributed among net retrieval operations. Instead, most of the catch of certain species was taken in a comparatively few sets. The methods used to summarize and report the bycatch do not reflect this highly aggregated catch distribution. Also, the methods used to determine observer levels have not taken catch aggregation into account. As a result, the numbers of observers in high seas driftnet fisheries and perhaps other fisheries with highly aggregated bycatch may be too low to allow incidental catch rate estimates with the desired level of accuracy.

By letter of 8 June 1992 the Commission advised the National Marine Fisheries Service of these findings and their potential implication for designing observer programs in general. In doing so, the Commission recommended that the Service conduct an in-depth investigation of the unsummarized observer data for the 1990 and 1991 driftnet fishing seasons, focusing on the levels of bycatch aggregation for different species and on determining the most appropriate statistical tools for characterizing the bycatch. The Commission recommended that the Service conduct a review focusing on the nature of the observer data and the statistical methods used to determine the level of observer effort for other observer programs.

On 5 August 1992 the Service replied to the Commission's letter noting that it agreed that the issues raised pertained to a broad range of species and several fisheries. It also noted that the Service planned to convene a workshop early in 1993 to examine the bycatch characteristics of different species. Workshop participants are expected to be asked to identify appropriate statistical methodologies for calculating optimal levels of observer coverage to achieve statistically reliable bycatch estimates for specific fisheries.

Actions by the United Nations

In December 1989 the United Nations General Assembly passed Resolution 44/225, sponsored by the United States and other nations. Among other points, the Resolution called upon international fishing organizations to review data on large-scale high seas driftnet fishing. It also called upon the international community to suspend such fishing by 30 June 1992 unless effective conservation and management agreements jointly concurred in by concerned international parties were developed to ensure that unacceptable impacts were prevented.

During the next two years, actions were taken in support of the Resolution by individual nations, international fisheries organizations, and the United Nations. These actions led to a reconsideration of the matter at the 46th Session of the United Nations General Assembly late in 1991. During that session, representatives of the United States and Japan agreed to support a driftnet fishing moratorium of indefinite length that could be phased in by the end of 1992.

The United States, Japan, and 28 other nations subsequently joined in cosponsoring Resolution 46/215 entitled "Large-Scale Pelagic Driftnet Fishing and Its Impact on Living Marine Resources of the World's Oceans and Seas." The General Assembly adopted the Resolution by consensus on 20 December 1991. Among other points, it calls on all members of the international community to: (1) reduce large-scale high seas driftnet fishing effort by 50 percent by 30 June 1992; (2) continue to ensure that driftnet fisheries do not expand into new areas; and (3) fully implement a global moratorium on all large-scale driftnet fishing on the high seas of all oceans and seas by 31 December 1992.

The Resolution does not address fishing with large-scale driftnet gear within the Exclusive Economic Zones of individual countries, nor does it call for suspending the use of small driftnets (less than a few kilometers in length) on the high seas. However, full compliance with its moratorium provision should substantially eliminate the risk of any further adverse effects by large-scale driftnet fishing on stocks of target and non-target species and pelagic ecosystems. Surveillance and enforcement arrangements likely will be needed to ensure compliance with the moratorium.

The 1992 Fishing Season

With adoption of United Nations General Assembly Resolution 46/215, Japan, Taiwan, and the Republic of Korea continued to permit their nationals to engage in large-scale high seas driftnet fishing in the North Pacific Ocean during 1992. Based on inquiries of each nation by the Department of State, however, all three nations had developed plans to reduce fishing effort by their nationals by at least 50 percent by 30 June, as called for in the Resolution. Each country employed a different combination of measures, but generally this objective was to be met by reducing the number of permitted driftnet fishing vessels, the length of net allowed to be deployed, the length of the fishing season, and/or the areas allowed to be fished.

As noted above, enforcement agreements between the United States and each of the driftnet fishing nations remained in force throughout 1992. Accordingly, key provisions, such as restrictions on the time and area of fishing operations, limits on the number of participating vessels, cooperation in high seas enforcement, and transmission of fishing catch and effort data to the United States were continued through the end of 1992.

Pelly Amendment Certifications

On 13 August 1991 the Secretary of Commerce certified to the President that both the Republic of Korea and Taiwan had failed to implement adequate driftnet monitoring and enforcement agreements with

the United States. In particular, vessels from both countries had been found fishing in areas closed under respective bilateral enforcement agreements. In response, the President notified Congress on 18 October that he had decided not to impose trade sanctions under the Pelly Amendment to the Fishermen's Protective Act pending an evaluation of both countries' response to U.S. concern regarding their failures.

On 3 April 1992 the Secretary of Commerce advised the President that both Taiwan and the Republic of Korea had taken punitive actions against vessel owners who had violated the enforcement agreements and that both nations largely had complied with the terms of their agreements with the United States since the initial certification finding. Pending further evaluation of each nation's actions regarding driftnet fishing, including adherence with the provisions of United Nations General Assembly Resolution 46/215, the Secretary noted that certification findings would remain in place. The Secretary also recommended that the President continue to defer sanctions against both nations.

Both certifications remained in place in 1992, but no sanctions were deemed warranted.

Related Activities

On 11 February 1992 representatives of the United States, Canada, Japan, and the Russian Federation signed the Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean. The Convention would prohibit directed fishing for salmon on the high seas of the North Pacific Ocean north of 33 degrees north latitude. It also would establish the North Pacific Anadromous Fish Commission to promote conservation of salmon species, as well as ecologically related species such as marine mammals and seabirds, throughout their migratory range in the North Pacific Ocean and adjacent seas. The new commission would also help coordinate high seas fishery enforcement activities by contracting parties. At the end of 1992 all nations had ratified the Convention; entry into force early in 1993 is anticipated.

On 28 February 1992 the United States also ratified the Convention for the Prohibition of Fishing with Long Driftnets in the South Pacific. Also called the Wellington Convention, this international agreement prohibits large-scale pelagic driftnet fishing within the Exclusive Economic Zones of South Pacific Island states and territories as well as in adjacent high seas areas.

On 2 November 1992 the President signed into law the High Seas Driftnet Fisheries Enforcement Act (Pub. L. 102-582). The Act is intended to strengthen U.S. efforts to support and help implement the global moratorium on high seas driftnet fishing called for in United Nations General Assembly Resolution 46/215. Among other things, the law denies port privileges in U.S. waters to any foreign vessel known to engage in large-scale driftnet fishing on the high seas after 31 December 1992. Such fishing by U.S. vessels both on the high seas and in U.S. waters has been prohibited since 1990. The Act also directs the Secretary of the Treasury to prohibit imports of fish, fish products, and sport fishing equipment from any nation whose nationals engage in driftnet fishing contrary to the moratorium and which fails to take appropriate action to terminate that fishing.

As of the end of 1992 Japan, the Republic of Korea, and Taiwan had each indicated its intent to comply with the terms of the U.N. Resolution and the ban on large-scale high seas driftnet fishing effective 1 January 1993. For example, in December 1992 the Government of Taiwan released a statement describing actions it had taken in support of United Nations Resolution 46/215. It noted that fishing certificates for 14 vessels had been revoked for violating its driftnet fishing regulations. It also noted that it had reduced the number of driftnet fishing vessels permitted to fish in the North Pacific Ocean to 64 (half the number that permitted in 1991) and in the Indian Ocean to 31 (one third the number permitted in 1991).

With regard to future restrictions, Taiwan's statement noted that it had taken steps to prohibit all large-scale pelagic driftnet fishing by its vessels effective 1 January 1993. Vessels leaving port to fish on the high seas will be prohibited from carrying driftnet fishing gear, vessels caught fishing illegally with large-scale driftnets will have their fishing certificates withdrawn, and captains and officers of vessels fishing illegally will have their professional certificates revoked and face up to six months in prison.

Conservation and Protection of Marine Mammals in the Southern Ocean

As noted in previous annual reports, at least 13 species of seals and whales inhabit or occur seasonally in the Southern Ocean, the seas surrounding Antarctica. Many of these species have been or could be affected adversely by various human activities in the area. Two of the seal species (the Antarctic fur seal and the southern elephant seal) and the regional populations of humpback, blue, fin, sei, and sperm whales were, and in the case of some whale populations remain, severely depleted as a result of unregulated or poorly regulated commercial hunting.

There has been no commercial sealing in the Antarctic since the 1950s. With the exception of several elephant seal colonies that have declined in recent years for unknown reasons, all of the exploited seal stocks appear to have recovered or to be recovering to pre-exploitation levels. Further, in 1972 the Antarctic Treaty Consultative Parties concluded the Convention for the Conservation of Antarctic Seals. This Convention, which entered into force in 1977, provides for strict regulation of commercial sealing in the Antarctic, should it ever be resumed. Also, the Antarctic Treaty Consultative Parties have recognized that diseases, such as the one that decimated the harbor seal population in the North Sea in 1988, could be carried by dogs and other non-native fauna and flora. The Parties, in the Antarctic Treaty Protocol on Environmental Protection discussed below, have taken steps to minimize the risk of exposing Antarctic seals and birds to non-indigenous diseases.

At present, there also is a moratorium on commercial whaling (see the discussion earlier in this chapter on the International Whaling Commission). Therefore, neither commercial sealing nor commercial whaling presently poses a threat to the continued existence of Southern Ocean populations of seals and whales. However, both commercial sealing and commercial whaling could be resumed in the future. In addition, developing fisheries, particularly the fishery for Antarctic krill (*Euphausia superba*), pose threats to seals, whales, and other species dependent upon fish and krill as their principal food source. In some areas, construction and operation of scientific stations and increasing tourism also pose threats.

Because of the possible direct and indirect effects of fisheries and other activities on marine mammals, the Marine Mammal Commission, as noted in previous annual reports, has undertaken a continuing review of matters that might affect marine mammals, krill, or other components of the Southern Ocean ecosystem upon which marine mammals may depend. It has made recommendations to the National Science Foundation, the Department of State, the National Oceanic and Atmospheric Administration, and the National Marine Fisheries Service on the need for basic and directed research, and for international agreements to effectively regulate sealing, whaling, fisheries, non-living resource exploration and development, and related activities in Antarctica and the surrounding seas.

Commission representatives participate in interagency meetings to develop U.S. policy regarding activities in Antarctica. Commission representatives also serve as advisors on many of the delegations to Antarctic Treaty Consultative Meetings and meetings of the Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources.

Activities and background information concerning activities carried out in 1992 are described below.

Antarctic Treaty Protocol on Environmental Protection

The Antarctic Treaty Consultative Parties, following conclusion of the Convention for the Conservation of Antarctic Marine Living Resources in May 1980, initiated negotiation of an agreement to govern possible mineral resource activities in the Antarctic. The negotiations, which were not concluded until June 1988, produced the Convention on the Regulation of Antarctic Mineral Resource Activities.

Subsequently, France and several other Consultative Parties indicated that they would not ratify the Convention. They proposed that mineral resource activities in the Antarctic be banned and that a sepa-

rate agreement be concluded to protect the Antarctic environment.

The Mineral Resource Convention will not enter into effect until it is ratified by all 26 of the Antarctic Treaty Parties that held consultative status at the time the Convention was concluded. Thus, the decision by a single country not to ratify the Convention meant that it could not enter into force.

At the XVth Antarctic Treaty Consultative Meeting in Paris in October 1989, the Treaty Parties agreed that a special consultative meeting should be held in 1990 to consider various proposals for protection of the Antarctic environment. Sessions of the XIth Special Antarctic Treaty Consultative Meeting, were held in Vina del Mar, Chile, from 19 November-6 December 1990, and in Madrid, Spain, on 22-30 April, 17-22 June, and 3-4 October 1991. At the latter session, the Protocol on Environmental Protection to the Antarctic Treaty was adopted.

The Protocol included four annexes setting forth specific obligations and requirements with respect to (1) prior assessment of the possible environmental impacts of planned activities in Antarctica; (2) conservation of native fauna and flora; (3) waste disposal and waste management; and (4) prevention of marine pollution. A fifth annex, setting forth specific obligations and requirements for special area protection and management was adopted at the XVIth Antarctic Treaty Consultative Meeting held in October 1991.

The purpose of the Protocol is to improve the effectiveness of the Antarctic Treaty as a mechanism for protecting the Antarctic environment and for ensuring that the Antarctic does not become the scene or object of international discord. It designates Antarctica as a natural reserve, devoted to peace and science. It establishes general governing principles and legally binding obligations to protect the Antarctic environment. It prohibits any activities relating to mineral resource exploration and development, and specifies that this prohibition cannot be lifted for at least 50 years following entry into force of the Protocol. It specifies that a legally binding regime to govern mineral resource activities must be in place before the prohibition can be lifted.

The Protocol will not enter into force until it has been ratified by all 26 of the current Antarctic Treaty Consultative Parties.

On 14 February 1992 the President transmitted the Protocol to the Senate for its advice and consent to U.S. ratification. The Senate provided its advice and consent on 7 October 1992. However, consistent with general practice, the United States will not formally ratify the Protocol until legislation has been passed to provide the government statutory authority to implement its provisions.

Proposed implementing legislation was drafted in 1992 by both the Administration and Congressional staff members. The draft bills differed substantially, and no action was taken on either in 1992. In 1993 efforts will continue to develop implementing legislation acceptable to both the Government and interested constituents.

The Marine Mammal Commission believes that if the United States acts promptly to pass effective implementing legislation, other Antarctic Treaty Consultative Parties will follow suit. On the other hand, if the United States does nothing, or if it adopts weak implementing legislation, it is likely that other Parties will act accordingly. Therefore, in 1993 the Commission will work through the Interagency Working Group on the Antarctic to develop and seek passage of effective implementing legislation.

First Meeting of Experts on Environmental Monitoring in Antarctica

Among other things, the Antarctic Treaty Protocol on Environmental Protection requires that Parties carrying out activities in Antarctica design and conduct programs to verify that the activities do not have unacceptable environmental impacts as defined by the Protocol. To assist in determining what would be required to meet this obligation, the XVIth Antarctic Treaty Consultative Meeting agreed that a meeting of experts should be held to identify the nature and significance of environmental impacts possibly resulting from research and other activities in Antarctica, as well as the types of monitoring programs that would be required to detect possible impacts.

The meeting was held in Buenos Aires, Argentina, on 1-4 June 1992. Participants included representatives of the Scientific Committee on Antarctic Research, the Council of Managers of National Antarctic Programs, IUCN-The World Conservation Union (formerly the International Union for the Conservation of Nature and Natural Resources), and a number of other international organizations, as well as representatives of 20 of the 26 Antarctic Treaty Consultative Parties. A Marine Mammal Commission representative was a member of the U.S. delegation.

To help prepare for the meeting, on 29-31 January 1992 the National Science Foundation's Division of Polar Programs held a Workshop on Antarctic Operations Environmental Monitoring and Assessment. Using information from this workshop and other sources, an interagency working group chaired by the Department of State subsequently developed a paper that identified and discussed a broad range of issues related to environmental impact monitoring. This paper and one prepared and submitted independently by the Scientific Committee on Antarctic Research and the Council of Managers of National Antarctic Programs were used to structure and focus meeting discussions.

The meeting participants concluded that the activities most likely to have impacts of concern relative to the Antarctic Treaty Protocol on Environmental Protection are the following: (1) station and airstrip construction and logistic operations; (2) waste water and sewage disposal; (3) incineration of waste; (4) power and heat generation; (5) activities involving taking or affecting the habitat of native fauna and flora; (6) scientific research; and (7) accidents resulting in fuel spills or other types of environmental contamination. The meeting participants noted that significant adverse environmental impacts would be unlikely, except perhaps at the local level, if all activities in Antarctica are conducted in accordance with the provisions of the Protocol on Environmental Protection. They also noted that environmental impact monitoring programs should be designed to meet specific objectives as economically as possible, and that they should be subject to periodic review to ensure that the objectives are being met cost-effectively. In this context, the meeting noted that programs should be designed and carried out cooperatively by all countries with programs in the Antarctic, and that both basic environmental data and monitoring data should be shared, so as to minimize costs.

The meeting recommended that research programs be established at a representative subset of facilities of different types and sizes in different environments (*e.g.*, inland stations on rock or earth and coastal stations on ice and ice shelves) to assess their impacts on the surrounding environment. The meeting also recommended that steps be taken to establish an Antarctic Data Directory and a cooperative system for archiving and providing easy access to environmental and other data necessary for cost-effective impact assessment and monitoring.

The meeting report was provided to the XVIIth Antarctic Treaty Consultative Meeting for its consideration (see below).

XVIIth Antarctic Treaty Consultative Meeting

The XVIIth Antarctic Treaty Consultative Meeting was held in Venice, Italy, on 11-28 November 1992. It was attended by representatives of all 26 Antarctic Treaty Consultative Parties. These are Argentina, Australia, Belgium, Brazil, Chile, China, Ecuador, Finland, France, Germany, India, Italy, Japan, The Republic of Korea, The Netherlands, New Zealand, Norway, Peru, Poland, Russia, South Africa, Spain, Sweden, the United Kingdom, the United States, and Uruguay. In addition, representatives of 10 of the 15 Treaty Parties that do not have consultative status attended as observers. These were Austria, Canada, Colombia, Czechoslovakia, Denmark, Greece, Hungary, Democratic People's Republic of Korea, Romania, and Switzerland. Representatives of a number of inter-governmental and non-governmental organizations also attended as observers. A Marine Mammal Commission representative was a member of the U.S. delegation.

The purposes of the regular Antarctic Treaty Consultative Meetings are to exchange information, hold consultations, and consider and recommend to the Party governments measures to further the principles and objectives of the Antarctic Treaty. The

principal items of discussion at the XVIIth Consultative Meeting were establishment of a permanent secretariat to facilitate information exchange and help organize consultative meetings, entry into force of the Protocol on Environmental Protection, environmental impact assessment and monitoring, the Antarctic protected area system, tourism and adventure travel, and liability for environmental impacts.

Antarctic Treaty Secretariat — Antarctic Treaty Consultative Meetings are organized and hosted by the Consultative Parties on a rotating basis. Transfer of information concerning member states' activities in Antarctica is done through an annual information exchange. As the number of Treaty Parties increased and international interest in Antarctica has grown, there has been growing recognition that both information exchange and organization of meetings could be enhanced by establishing a permanent secretariat. It also is recognized that effective implementation of the Protocol on Environmental Protection will require a permanent secretariat — *e.g.*, to support the work of the Committee on Environmental Protection to be established when the Convention enters into force.

At the XVIIth Consultative Meeting, agreement was reached in principle on the need for and the general functions of a small secretariat. Both Argentina and the United States offered to host the secretariat. Agreement could not be reached on where the secretariat should be located, how it should be funded and staffed, or what legal status it should be afforded. It was agreed that a meeting would be held, before the next Consultative Meeting scheduled to be held in the first half of 1994, to complete the work necessary to establish the secretariat.

Entry into Force of the Protocol — During the XVIIth Consultative Meeting, it was noted that all 26 Consultative Parties had signed the Protocol on Environmental Protection but that only Spain had deposited its instrument of ratification. A number of other countries, including the United States, indicated that they had initiated the process and expected ratification to be completed in either 1993 or 1994. As noted earlier, the Marine Mammal Commission believes that prompt development of effective implementing legislation by the United States will encourage other Parties to take similar action and speed entry into force of the Protocol.

Environmental Impact Assessment and Monitoring — When it enters into force, the Antarctic Treaty Protocol on Environmental Protection will require that during the planning stages Parties assess the possible environmental impacts of their activities in Antarctica and institute environmental monitoring programs to ensure that authorized activities do not have unacceptable environmental impacts. To help Parties meet these obligations, the Council of Managers of National Antarctic Programs has developed "Practical Guidelines for the Antarctic Environmental Impact Process." The XVIIth Consultative Meeting welcomed these guidelines, and pending entry into force of the Protocol, emphasized the importance of voluntarily implementing the environmental assessment procedures set forth in the Protocol.

At the XVIIth Consultative Meeting, participants also considered the report of the First Meeting of Experts on Environmental Monitoring in Antarctica, noted earlier. Meeting participants agreed that a workshop should be held to facilitate development of a cooperative data management system; that the Scientific Committee on Antarctic Research should be asked to provide advice on the types of long-term monitoring programs necessary to verify that Antarctic fauna and flora are not affected adversely by research and other activities in Antarctica and on standards for fossil fuel emissions; and that the Council of Managers of National Antarctic Programs, in consultation with the Scientific Committee on Antarctic Research, should be asked to establish research programs at a representative subset of Antarctic stations to determine the environmental impacts of different types and sizes of stations in different Antarctic environments.

The Antarctic Protected Area System — The XVIIth Consultative Meeting adopted management plans for four Specially Protected Areas. The meeting also considered measures that could be taken to improve the Antarctic Protected Area System and to begin to give effect to the provisions of Annex V of the Antarctic Treaty Protocol on Environmental Protection. The meeting was assisted in this regard by a paper summarizing the results of a Workshop on Antarctic Protected Areas convened jointly by the

Scientific Committee on Antarctic Research and IUCN-The World Conservation Union on 29 June-2 July 1992. Pending entry into force of the Protocol, the meeting called upon Parties to voluntarily take such steps as possible to ensure that all visitors to Antarctica are aware of the locations and purposes of protected areas and that they comply with the restrictions on entry and activities that can be conducted in these areas.

Tourism and Adventure Expeditions — In 1991 and 1992 the number of tourists and adventurers visiting Antarctica each year has surpassed the number of scientists and scientific support personnel working there. Such activities can interfere with research and have adverse environmental impacts. Consequently, at the XVIth Consultative Meeting, several Parties proposed developing an annex to the Antarctic Treaty Protocol on Environmental Protection that would explicitly address tourism. It was agreed that an informal meeting on tourism and non-governmental activities should be held in advance of the XVIIth Consultative Meeting.

The informal meeting on tourism and non-governmental activities was held in Venice on 9-10 November 1992. Discussion focused on a draft annex prepared by France, Spain, Germany, Italy, and Chile. These Parties argued that a high-visibility annex that synthesizes the relevant provisions of the Protocol and creates additional restrictions on non-governmental visitors to Antarctica is necessary to ensure that such activities, particularly tourism and adventure expeditions, do not interfere with science or adversely affect the Antarctic environment. Other Parties, including the United States, pointed out that all activities, including non-governmental activities, would be governed by the Protocol on Environmental Protection and that there was no apparent need for special measures to govern tourism or other non-governmental activities. They also pointed out that the draft annex contained provisions inconsistent with the Protocol and in some cases inconsistent with the Antarctic Treaty. For example, the draft annex included provisions that would limit access to Antarctica by requiring prior approval by Antarctic Treaty Consultative Meetings of tourist visits, restricting tourists to specific locations, and limiting the overall numbers of tourists and non-governmental visitors.

The differing viewpoints could not be resolved. It was agreed that the matter would be considered further at the next Antarctic Treaty Consultative Meeting.

Liability — Article XVI of the Antarctic Treaty Protocol on Environmental Protection calls upon Parties to develop an annex specifying rules and procedures for assessing and determining liability for environmental damage arising from activities in the Antarctic Treaty Area. At the XVIIth Consultative Meeting, Chile, Germany, and The Netherlands called for immediate negotiation of the liability annex. The United States and others argued that detailed preparatory work should be done before attempting to reach agreement on the liability annex and that establishing a secretariat and taking the steps necessary to bring the Protocol into force should be afforded higher priority. It was agreed that proposals would be developed and exchanged through diplomatic channels and that an expert legal group would be convened before or in conjunction with the XVIIIth Consultative Meeting to begin development of the liability annex.

National Academy of Sciences Study of the Effects of Antarctic Policy on Antarctic Science

The Antarctic Treaty Protocol on Environmental Protection recognizes that scientific research programs and related logistic support activities, as well as tourism and other non-governmental activities, could have adverse impacts on the Antarctic environment and its value as a scientific laboratory. It will require that Parties, among other things, assess the possible environmental impacts of research programs and related logistic support activities during the planning stages and take steps to assess and minimize the effects of activities that are conducted.

Scientists in the United States and other countries are concerned that these obligations and/or efforts to meet them will create bureaucratic impediments to basic research and reduce the amount of funding available to support basic research. To assess the validity of these concerns, the National Academy of Sciences proposed to the Department of State that a study be undertaken by the Academy's Polar Research Board to assess the impacts of Antarctic policy on

Antarctic science and the role that scientific considerations should play in establishing Antarctic policy, both domestically and internationally.

The Department of State provided funding for the study, and the Polar Research Board established a Committee on Antarctic Policy and Science to conduct the study. The first meeting of this Committee was held on 14-15 December 1992. At this meeting, representatives of Federal agencies, including the Marine Mammal Commission, and non-governmental groups reviewed with the Committee their interests and concerns regarding Antarctica.

The Committee plans to hold a workshop in February 1993 to further identify the range of issues having a bearing upon support and conduct of various types of science programs and related logistic support activities in Antarctica. It is hoped that the Committee's report will be available in time to be considered during development of U.S. implementing legislation for the Protocol on Environmental Protection.

Activities Related to Marine Living Resources

As noted in previous Commission annual reports, several countries began experimental fisheries for krill and finfish in the Southern Ocean in the 1960s. Concerns that the developing fisheries, particularly the krill fishery, could adversely affect seals, whales, and other non-target species, as well as target species, led the Antarctic Treaty Consultative Parties to negotiate and adopt the Convention on the Conservation of Antarctic Marine Living Resources.

The Convention was concluded in May 1980 and entered into force in April 1982. It established the Commission and the Scientific Committee for the Conservation of Antarctic Marine Living Resources. The first meetings of these bodies were held in 1982, and they have been held annually since then. The Marine Mammal Commission's involvement in negotiation of the Convention and the first ten meetings of the Commission and Scientific Committee are described in previous annual reports.

The 1992 meetings of the Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources were held in Hobart, Tasmania, Australia, from 26 October-6 November 1992. During the meetings, a broad range of issues were considered, including finfish, krill, and crab fisheries, development of a scientific observer program, assessment and avoidance of incidental mortality, and ecosystem monitoring.

In the late 1960s and early 1970s finfish catches in the Convention Area exceeded 200,000 metric tons annually. These catch levels could not be sustained, and many finfish stocks were already severely depleted when the Convention entered into force.

Finfish Fisheries — The total finfish catch in the 1991-1992 season was 58,218 metric tons, down from 98,610 metric tons taken in 1990-1991. Most of the catch (50,678 metric tons) was taken in sub-area 48.3 (the area around South Georgia Island) by Bulgarian, Chilean, Russian, and Ukrainian vessels. The majority of the catch (46,960 metric tons) was lantern fish (*Electrona carlsbergi*), a small myctophid that is an important component in the diets of several species of seabirds and other higher trophic level species.

At the 1992 meeting, the Commission for the Conservation of Antarctic Marine Living Resources, acting on the advice of its Scientific Committee, adopted conservation measures to (1) continue the prohibition on directed fishing for five species in sub-area 48.3 for both the 1992-1993 and the 1993-1994 fishing seasons; (2) prohibit taking of finfish, for other than scientific purposes, in sub-areas 48.1 (the Antarctic Peninsula) and 48.2 (the South Orkney Islands) during the 1992-1993 fishing season; (3) set catch limits of 9,200 metric tons for mackerel ice fish (*Champsocephalus gunnari*) and 3,350 metric tons for toothfish (*Dissostichus eleginoides*) in sub-area 48.3; (4) set bycatch limits for several species in statistical area 48.3; and (5) continue the 245,000 metric ton total allowable catch of lantern fish in sub-area 48.3. The Commission also adopted a conservation measure specifying that catches taken during fishing for research purposes by commercial fishing vessels, or vessels with similar catching capacity, shall be counted as part of the total allowable catch.

Krill Fishing — The total krill catch in 1991-1992 was 288,546 metric tons, down approximately 20 percent from the 357,538 metric tons taken during the

1990-1991 season. As in past years, most of the catch was taken in the Atlantic sector (statistical area 48). The decline in catch was due primarily to a decrease in the amount of krill taken by the fishing fleet from the former Soviet Union.

During the meeting, Australia informed the Commission that it had received and was considering a request to allow up to four Australian fishing vessels to take up to 80,000 metric tons of krill in the Antarctic during the 1992-1993 fishing season. Japan, Chile, Russia, Poland, and the Ukraine indicated that they expected no increase in their krill catches during the 1992-1993 season.

The Commission continued the precautionary 1.5-million metric ton limit on the catch of krill in statistical area 48 and adopted a conservation measure specifying sub-area quotas if the total catch in sub-areas 48.1, 48.2, and 48.3 exceeds 620,000 metric tons in any fishing season. The Commission also adopted a precautionary catch limit of 390,000 metric tons of krill in statistical division 58.4.2 (the Prydz Bay area).

The Scientific Committee again noted the need for catch data on a haul-by-haul basis to detect possible changes in catch-per-unit-effort and resulting changes in krill abundance. Japan indicated that, because of domestic legal restrictions, it was unable to submit haul-by-haul data. Japan further indicated that, in its view, catch-per-unit-effort would not provide a sensitive index of krill abundance and that synoptic surveys by research vessels were the only way to obtain reliable information on krill abundance. In light of this, the Commission requested that the Scientific Committee consider and provide advice on the survey effort that would be required to determine krill abundance in statistical area 48 and how often subsequent surveys would be needed to monitor krill abundance in the area in the continued absence of haul-by-haul data from the fishery.

Crab Fishery — As noted in the Marine Mammal Commission's two previous annual reports, the National Marine Fisheries Service issued a permit in 1990 authorizing a Seattle-based fishing vessel to conduct exploratory fishing for king crabs (*Paralomis spinosissima*) and stone crabs (*P. formosa*) in sub-areas 48.1, 48.2, and 48.3 during the 1990-1991 fishing season. This action sparked a debate and led the Commission for the Conservation of Antarctic Marine Living Resources, acting on the advice of its Scientific Committee, at its 1991 meeting to adopt a conservation measure in 1991 requiring that members provide advance notification and information on the nature of the fishery and fishery resources before authorizing any new fisheries in the Convention Area.

Because of logistics problems, the U.S. fisherman was unable to begin exploratory crab fishing in 1991. The problems were overcome, and two exploratory fishing trips were undertaken in 1992. Using data collected during the first trip, the Scientific Committee's Working Group on Fish Stock Assessment estimated that the crab resource in sub-area 48.3 may be sufficient to sustain an annual take of about 2,200 metric tons. The data were insufficient to allow confidence in this estimate and the Commission requested that the Scientific Committee develop a long-term management plan for the exploratory crab fishery. Pending development and implementation of the management plan, the Commission adopted a conservation measure prohibiting any member from allowing more than one vessel to participate in the crab fishery and limiting the total take to 1,600 metric tons if vessels from more than three members participate in the exploratory fishery.

To assist in preparing the long-term management plan, the United States offered to host a workshop to identify data needs and determine how those needs can best be met. The offer was accepted, and the workshop will be held at the Southwest Fisheries Science Center in La Jolla, California, in April 1993.

On a related matter, the Commission noted that it would be desirable to develop an agreed procedure for regulating exploratory fisheries while collecting the data necessary to ensure that they do not have adverse impacts as defined in Article II of the Convention. The Commission requested that the Scientific Committee and its working groups consider and provide advice on this matter in 1993.

Assessing and Avoiding Incidental Mortality — Marine mammals, seabirds, and other non-target species may be caught incidentally during commercial

fishing operations. They also may be caught and killed in lost and discarded fishing gear and other persistent debris dumped or discarded in the world's oceans.

As noted in the Marine Mammal Commission's previous annual reports, the Commission for the Conservation of Antarctic Marine Living Resources has taken a number of actions to assess and prevent or minimize such incidental mortality. The Living Resources Commission has, for example, developed and required that members provide an informational brochure to fishermen, researchers, and others working in the Convention Area to ensure that they are aware of the sources, fates, and effects of lost and discarded fishing gear and other potentially hazardous marine debris. The Commission also has adopted conservation measures prohibiting the use of net monitor cables, which seabirds often fly into, after the 1994-1995 fishing season. The measures also require that longline fishing operations be conducted using a streamer line to discourage birds from settling on baits during deployment of longlines and that operations be conducted in such a way that the baited hooks sink as quickly as possible after they are put into the water.

Information presented during the 1992 meetings of the Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources indicates that these efforts are being successful and should be continued. For example, the United Kingdom reported a dramatic drop in the volume of beach litter recovered on Signey Island. However, potentially hazardous debris continues to be found on beaches throughout the Antarctic. Also, it is not clear that all vessels fishing in the Convention Area are accurately recording and reporting the incidental mortality of seabirds, marine mammals, and other non-target species.

To get more reliable and comparable data on the nature and extent of the marine debris problem, the Commission asked the Secretariat to prepare guidelines suggesting standard methods for conducting marine debris surveys and formats for reporting their results. To get more reliable information on incidental mortality, members were urged to ensure that required data are collected and reported.

Observation and Inspection — Article XXIV of the Convention on the Conservation of Antarctic Marine Living Resources calls upon the Contracting Parties to develop a system of observation and inspection to promote the objectives and ensure observance of the provisions of the Convention. A system for carrying out at-sea inspections to ensure compliance with conservation measures adopted by the Commission was concluded and became effective in 1989.

Recognizing that size frequency and reproductive data, as well as data on the quantity of fish and krill caught, will be required to implement the Convention, the Commission, in 1990, requested that the Secretariat prepare and distribute a paper concerning establishment of a system for placing scientific observers aboard fishing and research vessels. The Secretariat prepared the requested paper, and during its 1991 meeting the Commission's Standing Committee on Observation and Inspection developed a proposal for an International Scientific Observation System. As noted in the Marine Mammal Commission's previous annual report, some members of the Living Resources Commission had reservations which prohibited agreement on the proposed system in 1991.

The reservations were resolved and a Scheme of International Scientific Observation was adopted at the Commission's 1992 meeting. The United States has initiated discussions with Japan and Russia to place scientific observers aboard their krill fishing vessels.

Ecosystem Monitoring — The Convention for the Conservation of Antarctic Marine Living Resources requires that fishing and related activities in the Convention Area be managed to prevent irreversible changes in the structure and dynamics of the Antarctic marine ecosystem, as well as to prevent overfishing and depletion of harvested populations. In 1984 the Scientific Committee for the Conservation of Antarctic Marine Living Resources established a working group to formulate and coordinate implementation of a multinational research program to assess and monitor the status of key components of the Antarctic marine ecosystem. Since then the working group has developed and members have begun to implement a long-term program with three major components: (1) monitoring of representative land-breeding krill predators (*e.g.*, Antarctic fur seals and Adelie and chinstrap

penguins) at a network of sites throughout the Antarctic; (2) comprehensive studies of krill, krill predators, and environmental variables in three integrated study areas (Prydz Bay, the Bransfield Strait, and the area around South Georgia Island); and (3) directed studies of crabeater seals — one of the Antarctic marine ecosystem's principal krill consumers — in one or more pack ice areas. The working group also prepared a manual published by the Secretariat on standard methods for collecting and reporting monitoring data.

The working group met in Vina del Mar, Chile, from 12-21 August 1992. The report from the meeting was considered by both the Scientific Committee and the Commission. It noted the working group's continuing concern that most krill fishing in the Antarctic was being done within the foraging ranges of land-breeding birds and seals at the time of year (December through February) when these krill-eating predators are rearing offspring. The report also noted that available data and ongoing monitoring programs are insufficient to predict or to detect the effects of the krill fishery on these krill-dependent predators. The report indicated that given the uncertainties, it would be appropriate as a precautionary measure, to prohibit krill fishing within the foraging ranges of land-breeding krill predators (up to 50 km for penguins and 80-100 km for fur seals) at the time of the year that they are rearing offspring.

Most, but not all, members of the Scientific Committee and Commission thought that it would be highly desirable to prohibit krill fishing in the vicinity of fur seal and Adelie and chinstrap penguin breeding colonies during the breeding season, except in cases where the breeding colonies are being monitored as part of the Ecosystem Monitoring Program. Japan and other krill-fishing nations believed that the 1.5-million metric ton limit on krill catches in statistical area 48 provided adequate assurance that krill predators would not be affected adversely by the fishery and that the proposed time and area closures would unnecessarily restrict fishing. To help resolve these differing viewpoints, the Secretariat was asked to undertake a simulation analysis, prior to the 1993 meeting of the working group, to examine the possible effects on the krill fishery of subdividing statistical area 48.1 and closing one or more subdivisions simultaneously and in rotation to protect land-breeding krill predators.

On a related point, the Scientific Committee noted that available data and monitoring programs were insufficient to predict or detect the effects of the krill fishery on crabeater seals breeding on pack ice and that the Scientific Committee on Antarctic Research Group of Specialists on Antarctic Seals had proposed a workshop to plan a coordinated, multi-national research initiative on Antarctic ice-breeding seals. The Scientific Committee recommended that the Commission support the proposal, and the Commission endorsed the recommendation.

U.S. Antarctic Marine Living Resources Research Program

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

The plan was developed in consultation with the National Science Foundation, the Marine Mammal Commission, other Federal agencies, knowledgeable scientists in the United States and abroad, representatives of the U.S. fishing industry, and representatives of U.S. environmental groups. Responsibility for carrying out the directed research program initially was given to the Narragansett Laboratory of the National Marine Fisheries Service's Northeast Fisheries Science Center. In 1989, program responsibility was transferred to the Service's Southwest Fisheries Science Center.

To evaluate the effectiveness of the program after three years of operation, the Director of the Southwest Center held a program review on 27-29 May 1992. The review panel included representatives of the Marine Mammal Commission and several universities, as well as scientists from the National Marine Fisheries Service. The panel found the program to be well conceived and focused appropriately on tasks that (a) are essential to meeting the ecosystem-oriented objectives of the Convention for the Conservation of Antarctic Marine Living Resources, (b) can best be done with U.S. technology and scientific expertise, and (c) are not being done by other Parties to the Convention. The panel noted, however, that the program has been constrained by limited and uncertain funding, by uncertainties regarding ship support, and by the inability to conduct trawl surveys with commercial-size nets. The panel recommended that the Center seek funding and ship commitments at least two years in advance and for periods of at least 3-5 years. Doing so would permit better long-term planning and coordination with the basic research program being supported by the National Science Foundation and the directed research programs carried out by other members of the Commission for the Conservation of Antarctic Marine Living Resources. The panel also recommended that an ecosystem model be developed and used to help identify research and management priorities and that a quantitative population biologist be hired or assigned fulltime to do modeling studies and stock assessments.

Convention on International Trade in Endangered Species of Wild Fauna and Flora

The Convention on International Trade in Endangered Species of Wild Fauna and Flora provides an international framework for regulating trade in animals and plants that are or may become threatened with extinction. The Convention entered into force in 1975 and currently comprises 118 Parties, including Djibouti, Czechoslovakia, Equatorial Guinea, and Barbados, all of whom became signatories during 1992. Within the United States, the Fish and Wildlife Service acts as the lead agency for Federal actions carried out under the Convention.

The Convention provides for three levels of trade control, depending upon the extent to which a species is endangered. The degree of control is reflected by a species' inclusion on one of three appendices to the Convention. Appendix I includes those species considered to be threatened with extinction and that are or may be affected by trade. Appendix II includes species that are not necessarily threatened with extinction but could become so unless trade in them is strictly controlled. Species may also be included on Appendix II if they are so similar in appearance to a protected species that the two could be confused. Appendix III includes species that any Party identifies as being subject to regulation within its jurisdiction for the purpose of preventing or restricting exploitation and for which the Party needs the cooperation of other Parties to control trade. Additions or deletions of species listed on Appendices I and II require concurrence by two-thirds of the Parties voting on a listing proposal. Species may be placed on Appendix III unilaterally by any Party.

Parties to the Convention meet every two years to consider, among other things, additions and deletions to the appendices. The Eighth Conference of Parties to the Convention was held 2-13 March 1992 in Kyoto, Japan. Only one change was proposed with respect to marine mammals. This was the U.S. proposal, discussed in the previous annual report, to remove the northern elephant seal (*Mirounga angustirostris*) from Appendix II. The proposal was made at the request of the National Marine Fisheries Service, which noted that the species has re-occupied most of its historic range and that other than losses through a small incidental catch, taking is limited to a few specimens collected for scientific research or public display. At the Eighth Conference, the Convention Parties agreed to remove the northern elephant seal from Appendix II.

Prior to the Conference of Parties, the issue of adding the walrus to Appendix II was again raised. This matter had been considered in 1987 when The Netherlands submitted and then withdrew a proposal to list the walrus on Appendix II. During 1991, The Netherlands initiated a study to determine whether to resubmit the proposal to the 1992 Convention. The study concluded that available information on walrus populations was not sufficient to meet the criteria for

including the species on Appendix II, and recommended that population counts be made of different populations, including studies of sex and age ratios and population stability. It was also recommended that the data obtained be used to reevaluate the status of the walrus prior to the next CITES convention. Based on this advice, The Netherlands has decided to reevaluate the walrus situation during 1993 for possible consideration at the Ninth Conference of Parties to the Convention, to be held in the United States in 1994.

Chapter VI

MARINE MAMMAL STRANDINGS AND DIE-OFFS

Since the late 1970s there appears to have been an increase in the incidence of unusual marine mammal mortalities throughout the world. These incidents have occurred in widely separated areas and have involved a variety of marine mammal species, including monk seals in the Northwestern Hawaiian Islands, harbor seals in New England, sea lions in California, manatees in Florida, bottlenose dolphins in Texas, and humpback whales in Cape Cod, Massachusetts. Among the largest and most publicized were the deaths of more than 700 bottlenose dolphins along the U.S. mid-Atlantic coast in 1987-1988, more than 17,000 harbor seals in the North Sea later in 1988, and more than 1,000 striped dolphins in the Mediterranean Sea in 1990-1991.

Unusual Mortality Events in 1992

In 1992 the unusual marine mammal mortality events described below occurred in U.S. waters. Also, evidence of phocine distemper, the cause of the large harbor seal die-off in the North Sea in 1988, was found for the first time in seals in U.S. waters.

Bottlenose Dolphins in Texas

In March 1992, 59 bottlenose dolphins washed up on beaches in Aransas and Calhoun Counties, Texas, and were recovered dead. Of these, 46 washed up in an eight-day period between 16 and 24 March.

The Texas Marine Mammal Stranding Network advised the National Marine Fisheries Service early in April that stranding levels in the two counties were much higher than previous averages for that time of year. The Service initiated an on-site investigation on 12 April. In addition, the Service consulted the Task Force on Unusual Marine Mammal Mortalities for advice on what should be done to determine the magnitude and cause of the event. This task force had been constituted by the Service during the investigation of the unusually high numbers of bottlenose dolphin mortalities that occurred in the northern Gulf of Mexico from January through June 1990.

Members of the task force met with representatives of the Service and the Marine Mammal Commission during the Commission's meeting in Tallahassee, Florida, on 30 April-2 May 1992 to review the ongoing investigation. During the review it was noted that water, sediment, and fish samples had been collected in areas near where the dead dolphins were being found and that surveys were being conducted to look for both live and dead dolphins in nearby areas. It also was noted that all of the dolphin carcasses that had been found were badly decomposed, suggesting that they had died at least several days before they were found. In addition, it was noted that on 14 April numerous dead fish (primarily black drum and catfish), along with five bottlenose dolphins and a number of seabirds, had been found on Sand Point in Lavaca Bay. These, too, were badly decomposed or had been eaten by scavengers to the extent that few useful tissue samples could be collected for disease and contaminant analyses.

The task force endorsed the various components of the investigation initiated by the Service. It also recommended that a number of live animals be captured and that blood and other tissue samples be collected from these animals to determine if they had diseases or contaminant levels that might explain the unusually high mortality. In response, the National Marine Fisheries Service made arrangements to locate, capture, and collect samples from up to 50 bottlenose dolphins in and near the two-county area. The Service subsequently captured and released 38 dolphins in July. An extensive set of samples was collected from each animal. Analyses of the samples had not yet been completed as of the end of 1992. The Service also funded a study to determine the

movement patterns of bottlenose dolphins in the area. As noted in Chapter X, the Commission provided funds to purchase radiotags to enhance this effort.

The fact that most animals appeared to have died in a very short period of time suggested that the deaths may have been due to an extremely virulent disease or a toxic substance. Traces of aldicarb, an insecticide commonly used in the area to prevent insect infestation of sorghum and cotton, were found in several of the water samples collected during the investigation. Aldicarb is highly toxic to mammals. Although no traces of the chemical were found in any of the dolphins or other animals found dead in the area, such chemicals cannot be detected in badly decomposed animals. Thus, failure to find evidence of the chemical in the tissue samples does not rule out the possibility that aldicarb was responsible or contributed to the deaths. No indications of naturally occurring biotoxins, diseases, or potentially harmful levels of other contaminants were found.

The investigation is not expected to be completed until sometime in 1993. The Commission, in consultation with its Committee of Scientific Advisors, will review the results of the investigation and advise the National Marine Fisheries Service, the Environmental Protection Agency, the Department of Agriculture, and other appropriate agencies of follow-up actions needed to assess and avoid future mortalities of this type.

Sea Lions and Other Pinnipeds in California

In late May 1992 more than 1,500 seals, mostly juvenile California sea lions, began hauling out and dying on beaches in California. Most of the animals were emaciated and lethargic, suggesting that they were dying of starvation.

The unusual occurrence coincided with an El Niño — a meteorological and oceanographic phenomenon that occurs at irregular intervals in the eastern tropical Pacific and which is characterized by warming of surface waters. When a similar but stronger El Niño event occurred in 1982-1983, many pinnipeds died due to starvation. There were no indications, in either case, of unusual diseases, biotoxins, or unusually high levels of environmental contaminants. Thus, it appears that warming of surface waters altered the distribution or abundance of prey species to such an extent that the affected pinnipeds were unable to find sufficient food.

[For information on the effects of El Niño events on pinnipeds, see Trillmich, F., and K. A. Ono (Eds). 1991. Pinnipeds and El Niño: Responses to Environmental Stress. Ecological Studies 88. Springer-Verlag, New York, Berlin, Heidelberg. 291 pp.]

Harbor Seals in Oregon and Washington

On 4 October 1992 biologists working on the Columbia River found 13 harbor seals, three harbor porpoise, and one rough-toothed dolphin dead on beaches near Astoria, Washington. Other nearby beaches were searched on 5-7 October and 14 additional harbor seals and one harbor porpoise were found.

The National Marine Fisheries Service recovered most of the animals, conducted necropsies, and collected tissue samples. Seventeen of the 18 harbor seals recovered had bleeding from the nares, moderate to extensive hematoma in cervical and thoracic musculature and internal organs, and extensive pooling of blood in the thoracic and abdominal cavities. Two of the animals also had punctures in the abdomen that appeared to be gunshot wounds. No evidence of biotoxins or unusual concentrations of heavy metals or organochlorine compounds were found.

None of the porpoises showed signs of trauma. The findings suggest that the harbor seal and porpoise mortalities were unrelated. The tissue damage and bleeding found in the harbor seals was consistent with concussion trauma caused by underwater explosions.

Phocine Distemper Virus in U.S. Waters

The death of more than 17,000 harbor seals in the North Sea in 1988 was attributed to a morbillivirus. The virus is similar to but not the same as the morbillivirus that causes distemper in dogs.

In December 1991 the New England Aquarium reported to the National Marine Fisheries Service that

antibodies to distemper had been found in blood serum from a harbor seal that had been rehabilitated at the Aquarium. The Aquarium then ran tests on serum samples from other recently stranded harbor seals and found antibodies to distemper in 14 of 41 samples. None of the animals, however, had clinical signs of acute distemper.

Early in February 1992 the OKEANOS Ocean Research Foundation in Long Island, New York, informed the National Marine Fisheries Service that a stranded harbor seal had been found with an active clinical case of distemper.

Although a number of additional seals have been found with distemper, there has not been a massive die-off like the one that occurred in the North Sea in 1988. As a precautionary measure, the National Marine Fisheries Service has required that all rehabilitated seals be tested for phocine distemper. Those testing positive for the virus are not to be released back into the wild. The Service also has contracted for a study to analyze serum samples collected from seals since 1972 to determine if the phocine distemper virus may have been present in seals along the U.S. coast, but not causing a discernible problem.

Marine Mammal Stranding Network and Tissue Bank

In 1977 the Commission sponsored a workshop on marine mammal strandings. Subsequently, the National Marine Fisheries Service has worked with public display facilities, museums, and other interested organizations and individuals to establish volunteer programs for reporting and responding to marine mammal strandings in each of its management regions. These regional stranding networks have been responsible for identifying and initiating the investigations of all unusual marine mammal mortality events in U.S. waters since the late 1970s.

Following the unusually high bottlenose dolphin mortality that occurred along the U.S. mid-Atlantic coast in 1987-1988, the National Marine Fisheries Service constituted an *ad hoc* group of experts to provide advice on ways that the stranding networks and responses to unusual mortalities might be improved. At the same time, the Service undertook a comprehensive review of the structure and operation of the Regional Marine Mammal Stranding Networks. Based upon its review and the advice of the *ad hoc* group of experts, the Service has taken a number of steps to improve operation of the networks. For example, procedures for authorizing individuals and organizations to participate in the regional networks have been standardized. Further, general reporting and performance standards have been established.

In 1992 the Service contracted for the development of a field manual to guide responses to marine mammal strandings. As noted in Chapter X, the Commission provided funds to illustrate this guide.

National Marine Mammal Tissue Bank

During the investigation of the bottlenose dolphin die-off in 1987-1988, it became clear that there were inadequate baseline data and no source of tissues that could be analyzed to determine pre-existing levels of anthropogenic contaminants and natural biotoxins present in the population prior to the die-off. To begin to overcome this problem, the National Marine Fisheries Service took steps in 1989 to establish a National Marine Mammal Tissue Bank. To ensure the utility of the bank, the Service established an *ad hoc* group of experts to overview its development. Based upon advice provided by the group, the Service has (1) established basic protocols for collecting, preparing, storing, and accessing tissue samples; (2) conducted a pilot program to test the protocols; and (3) initiated studies to determine whether the levels of various contaminants present in tissues vary with time or according to the part of the body from which the tissue samples are taken.

Recognizing the important need to improve both the tissue bank and the stranding network, the Service developed and in October 1992 published a program development plan for the National Marine Mammal Tissue Bank and Stranding Network Program. The plan describes the basic objectives, components, and policies of both programs.

Legislation

On 4 November 1992 the Oceans Act of 1992 (Pub. L. 102-587) was signed into law. Title III of that Act, the Marine Mammal Health and Stranding Response Act, added a new title to the Marine Mammal Protection Act. In large part, Congress passed the Marine Mammal Health and Stranding Response Act for two main reasons: (1) the concern that the understanding of the connection between marine mammal health and the various components of the marine environment is currently insufficient to allow an adequate understanding of the causes of unusual marine mammal mortality events, and (2) the concern that responses to unusual marine mammal mortality events are often uncoordinated due to insufficient contingency planning.

To address these problems, the Act requires the Secretary of Commerce to establish a "Marine Mammal Health and Stranding Response Program." The program has three primary purposes: (1) to facilitate the collection and dissemination of data on the health and health trends of marine mammals in the wild; (2) to correlate the data on marine mammal health with available data on physical, chemical, and biological environmental parameters; and (3) to coordinate effective responses to unusual mortality events. Among other things, the Secretary is directed to collect and update information on procedures for rescuing and rehabilitating stranded marine mammals and for collecting, preserving, and ensuring the integrity of marine mammal tissue specimens. In consultation with the Secretary of the Interior, the Marine Mammal Commission, and others knowledgeable about marine mammals, the Secretary is also required to develop objective criteria for determining the point at which a rehabilitated marine mammal can be returned to the wild.

Other duties of the Secretary include compiling and analyzing, on a regional basis, information on stranded marine mammals, including the species and numbers involved, the condition of the animals, and the causes of any illnesses or deaths. Most, if not all of the Secretary's responsibilities under the program, are expected to be carried out by the National Marine Fisheries Service's Office of Protected Resources.

To improve responses to unusual marine mammal mortalities, the Act directs the Secretary of Commerce, in consultation with the Secretary of the Interior, to establish an expert working group. The working group is expected to provide advice and guidance for determining when unusual mortality events are occurring, for developing a contingency plan to respond to such events, and for determining when actions taken in response to unusual mortalities are no longer needed. Based upon the advice of the working group, the Secretary is to publish by 4 May 1994 a proposed contingency plan for responding to unusual marine mammal mortalities for public review and comment. A final plan is to be completed by 4 November 1994.

The plan shall include a list of those persons who can assist in implementing a coordinated response to an unusual mortality event; the types of tissues to be collected and the analyses to be done to assist in diagnosing the cause or causes of the unusual mortality event; procedures for training, mobilizing, and using personnel to provide for a rapid and effective response to unusual mortalities; and those actions needed to respond to an unusual mortality event, including actions designed to minimize the deaths of marine mammals, to identify the cause or causes of the event, and to determine the effects of the event on the affected populations.

In the event of an unusual marine mammal mortality event, the Secretary is to designate one or more on-site coordinators to direct and coordinate the response. In general, the response is to be carried out in accordance with the contingency plan, and the on-site coordinator is expected to use his or her best professional judgment with respect to matters not covered in the contingency plan.

The Marine Mammal Health and Stranding Response Act also formalizes the establishment of a National Marine Mammal Tissue Bank. The tissue bank, which the National Marine Fisheries Service began developing after the 1987-1988 east coast die-off of bottlenose dolphins, is to contain representative tissue samples collected from marine mammals involved in unusual mortality events, taken incidental to commercial fisheries, or taken by Alaska Natives for subsistence purposes. The Secretary of Commerce

is charged with developing guidance regarding collection, preparation, archiving, and quality control of specimens to be maintained in the tissue bank. The legislation mandates that uniform methods, standards, and procedures for collection and archiving be established to provide confidence in marine mammal tissue samples used for research.

The Secretary also is required to issue guidance for analyzing tissue samples, using "the most effective and advanced diagnostic technologies and tools practicable," to monitor and measure overall health trends in representative populations of marine mammals, to identify the levels and effects of potentially harmful contaminants, and to determine the frequency and causes of any abnormal lesions. A record of specimens in the tissue bank and information derived from those specimens is to be maintained in a central database. Qualified scientists, including participants in the marine mammal stranding networks, are to be given access to specimens in the tissue bank and to the information and analyses contained in the database.

The legislation also establishes a Marine Mammal Unusual Mortality Event Fund. Monies in this fund are to be used to compensate stranding network participants and others for special costs incurred while responding to unusual mortality events and for reimbursing stranding network participants for costs associated with preparing and transporting tissue bank specimens collected during such events. The Act authorizes $500,000 to be appropriated to the fund for Fiscal Year 1993. In addition, the Secretary may solicit and accept donations to the fund.

Chapter VII

IMPACTS OF MARINE DEBRIS

Plastic and other synthetic material lost or intentionally discarded into the marine environment kill or injure individuals of many marine species, including marine mammals. In particular, derelict fishing nets and traps, rope and line, strapping bands, and other such debris may entangle marine mammals, seabirds, turtles, fish, and crustaceans. Entangled animals may drown, lose their ability to catch food or avoid predators, or incur wounds and infections from the chafing of attached debris.

Marine animals also may ingest debris associated with prey or debris that in shape or color resembles natural prey items. Once ingested, synthetic materials may block digestive tracts, perforate or otherwise damage stomach linings, create a false sense of satiation that lessens the feeding drive, or reduce the normal uptake of nutrients through the digestive tract.

While instances of interactions between animals and debris have been reported in the scientific literature for many years, it was not until the early 1980s that the potential scope of such occurrences became a source of concern. Recognizing the need for a careful examination of the issue, the Marine Mammal Commission provided initial funding and terms of reference for what became the first international symposium on marine debris. It was convened by the National Marine Fisheries Service in November 1984.

The results of that meeting, entitled the Workshop on the Fate and Impact of Marine Debris (see Appendix C, Shomura and Yoshida 1985), suggested that marine debris was affecting a wide range of species throughout the world's oceans and that interactions between debris and marine life were far more frequent than previously thought. Among the species affected were some of the most endangered forms of marine life, including Hawaiian monk seals, right whales, West Indian manatees, and Kemp's ridley and green sea turtles in the United States. The workshop findings served to identify marine debris as a serious form of ocean pollution whose effects went far beyond aesthetic impacts. As a consequence, the workshop set in motion national and international actions to study and prevent marine debris pollution.

As described in previous annual reports, since the 1984 workshop, the Marine Mammal Commission has remained actively involved in developing domestic and international programs to address marine debris pollution. Its activities during 1992, as well as those of some of the other involved agencies and groups, are discussed below.

The Marine Entanglement Research Program

In response to the results from the 1984 workshop and other information on the effects of marine debris, the U.S. Congress appropriated $1,000,000 to the National Marine Fisheries Service in 1985 to develop a program to study and mitigate marine debris pollution. The Marine Mammal Commission, in consultation with the Service, played a lead role designing the initial program. Since then work has been carried forward through the Service's Marine Entanglement Research Program with annual appropriations from Congress ranging from $700,000 to $750,000. As directed by Congress, the Service has obtained the Commission's concurrence on how annual appropriations are to be spent.

On 10-11 June 1992 the Service convened a program planning meeting at the Northwest Fisheries Science Center to identify funding priorities for Fiscal Year 1993. A representative of the Commission participated in the meeting. Based on its results, the Service developed a proposed program plan that was provided to the Commission for review on 24 Novem-

ber 1992. The Fiscal Year 1993 program plan proposes support in the amount of $638,000 for 14 projects in the areas of public education and awareness, research and monitoring, mitigation, and program management.

Significant causes of marine debris are the cumulative disposal practices of individual fishermen, ship operators, commercial seamen, beach-goers, and other users of the marine environment. To engender broad support from these groups, education and awareness programs are needed to explain problems created by debris, appropriate ways of disposing of garbage, and applicable legal requirements. The largest share of program funds has therefore been devoted to public education and awareness tasks. For 1993 program plans call for continued support for the regional marine debris information offices and development of a marine debris outreach campaign for the Gulf of Mexico and the wider Caribbean area.

Research and monitoring activities are needed to evaluate the effectiveness of mitigation efforts and to identify potential problems. As part of the 1993 program, support is to be provided for continuing surveys to monitor entangling debris on certain Alaska beaches; continuing marine debris surveys by the National Park Service at selected national seashores; developing a database on marine debris at sea by placing observers aboard domestic fishing vessels in the North Pacific; studying the effects of marine debris on juvenile sea turtles in the North Atlantic; and convening a workshop to examine statistical means of interpreting marine debris data sets to identify trends in the types and amounts of debris.

Mitigation tasks in the 1993 program will provide support for continuing national beach clean-up campaigns; disentangling Hawaiian monk seals and removing hazardous debris from monk seal haulout beaches; a study by the Marine Board of the National Research Council to identify steps to better implement U.S. commitments to regulate the disposal of garbage from ships under international law; and developing guidelines for marina operators on measures they should take to prevent marine debris pollution.

An additional task will be to support planning for the third international conference on marine debris, to be held in 1994 (see below).

On 18 December 1992 the Commission, in consultation with its Committee of Scientific Advisors, wrote to the Service noting that the proposed plan reflects the results of the June 1992 program planning meeting and recommending that the Service proceed with implementing the proposed work.

Third International Conference on Marine Debris

In 1984 at the recommendation of the Marine Mammal Commission and with initial funding by the Commission, the National Marine Fisheries Service convened the Workshop on the Fate and Impact of Marine Debris in Honolulu, Hawaii. That workshop was the first attempt to thoroughly examine marine debris problems, and its findings prompted responsive actions by many governmental and non-governmental groups.

On April 2-7 1989 the Service convened the Second International Conference on Marine Debris, also at the recommendation of the Commission. The second conference afforded a chance to review and summarize progress made since the first meeting and to identify future directions for needed research and management activities. Its results (see Appendix C, Shomura and Godfrey 1990) have been used to direct the Marine Entanglement Research Program as well as to identify needed actions by other domestic and international programs.

During 1992 the Service began planning for the Third International Conference on Marine Debris. To help plan the conference, the Service constituted a steering committee that met in Silver Spring, Maryland, on 9 July 1992. A representative of the Commission serves on the committee. During its July meeting the committee offered advice on the conference objectives, structure, planning schedule, venue, date, and other meeting details.

Plans call for holding the meeting in Miami, Florida, in May 1994. The venue was selected to emphasize marine debris issues in and around the North Atlantic Ocean basin, particularly in the wider Caribbean region which recently was added to the list of Special Areas under Annex V of the Convention for the Prevention of Pollution from Ships (see below). Objectives of the meeting are to review the state of knowledge regarding the amounts and impacts of marine debris and to develop international frameworks for controlling the principal sources of debris. Proposed conference sessions will address the amounts, types, and distribution of marine debris; its impacts; and its origins, including vessel-based, recreational, urban, and rural coastal/upland sources.

A preliminary conference announcement is expected to be circulated early in 1993.

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

The International Convention for the Prevention of Pollution from Ships (MARPOL) is an international agreement signed in 1973 to establish a cooperative framework for controlling deliberate and accidental pollution of the marine environment from ships. A protocol to the Convention concluded in 1978 added five annexes that address particular forms of pollution, as follows: Annex I, oil pollution; Annex II, noxious liquid substances carried in bulk; Annex III, harmful substances carried in packaged form or freight containers; Annex IV, sewage; and Annex V, ship-generated garbage.

Three principal features of Annex V include (1) prescribed limits on the at-sea disposal of ship-generated garbage, including a prohibition on disposal of plastics (see Table 13); (2) the establishment of "Special Areas" where more stringent discharge restrictions apply; and (3) a requirement that nations ensure that ports have suitable, convenient reception facilities to receive and properly dispose of ship-generated garbage returned to port. Discharge restrictions in Annex V apply to all vessels except government vessels, including military ships.

Annex V is an optional annex, which means that separate action is required by nations wishing to accede to its provisions. The criteria needed for this Annex to enter into force were met on 31 December 1987, and its provisions became binding on signatory nations one year later. At the end of 1987, 31 nations (including the United States) representing more than 50 percent of the world's commercial shipping tonnage had ratified or otherwise accepted Annex V. As of the end of 1992, this had increased to 59 nations. As contracting parties, these nations are obligated to incorporate the Annex's provisions into their domestic laws. Notwithstanding the exception for government vessels, domestic laws apply to all vessels registered within that country wherever they travel and to all foreign vessels while they are within that nation's jurisdictional waters.

The Marine Environment Protection Committee of the International Maritime Organization is responsible for overseeing international cooperation relative to this Convention, and the U.S. Coast Guard acts as the lead agency representing the United States at its meetings. Committee meetings are held at the organization's headquarters in London, England. Recent U.S. and international efforts relative to Annex V are discussed below.

Domestic Regulations

In April 1989 the U.S. Coast Guard adopted interim rules to implement the provisions of Annex V in the United States. Final rules were adopted in September 1990. Since then the Coast Guard, in cooperation with the Department of Agriculture's Animal and Plant Health Inspection Service, has steadily increased enforcement efforts regarding these regulations. In 1989, 30 violation cases were initiated; in 1990, there were 100 cases; in 1991, 120 cases; and through June 1992, 88 cases. A number of these violations involved non-U.S. flag vessels.

Enforcement of Convention provisions has historically been done under a flag-state system. This means that violations by foreign-flag vessels that occur outside of the U.S. territorial sea (*i.e.*, beyond three nautical miles from shore) but within the U.S. 200-mile Exclusive Economic Zone are referred through the State Department to the national govern-

Table 13. Summary of garbage discharge limitations under the International Convention for the Prevention of Pollution from Ships (1973-1978) and the U.S. Act to Prevent Pollution from Ships, as Amended

Type of Garbage	Discharge Prohibitions for All Vessels		Discharge Prohibitions for Offshore Platforms and Associated Vessels[3]
	Outside Special Areas[1]	Inside Special Areas[2]	
Plastics, including synthetic ropes and fishing nets and plastic bags	Disposal prohibited	Disposal prohibited	Disposal prohibited
Dunnage, lining, and packing materials that float	Disposal prohibited less than 25 miles from nearest land	Disposal prohibited	Disposal prohibited
Paper, rags, glass, metal bottles, crockery, and similar refuse	Disposal prohibited less than 12 miles from nearest land	Disposal prohibited	Disposal prohibited
Paper, rags, glass, *etc.*, comminuted or ground[4]	Disposal prohibited less than 3 miles from nearest land	Disposal prohibited	Disposal prohibited
Food waste not comminuted or ground	Disposal prohibited less than 12 miles from nearest land	Disposal prohibited less than 12 miles from nearest land	Disposal prohibited
Food waste comminuted or ground[4]	Disposal prohibited less than 3 miles from nearest land	Disposal prohibited less than 12 miles from nearest land	Disposal prohibited less than 12 miles from nearest land
Mixed refuse types	Apply most stringent disposal restriction	Apply most stringent disposal restriction	Apply most stringent disposal restriction

1 Under the Act To Prevent Pollution from Ships, discharge limitations in the United States apply within all navigable waters, including rivers, lakes, and other inland waters.
2 Special Areas listed in Annex V are the Mediterranean, Baltic, Red, Black, and North Seas; the Persian Gulf/Gulf of Oman; the Wider Caribbean Region; and the Antarctic Ocean. Of these, only the North Sea and the Antarctic Ocean had become effective as of the end of 1992.
3 Offshore platforms and associated vessels include all fixed or floating platforms engaged in exploitation or exploration of seabed mineral resources and all vessels alongside or within 500 m of such platforms.
4 Comminuted or ground garbage must be able to pass through a 25-mm (1-inch) mesh screen.

ment under which the offending vessel is registered. As of June 1992, 111 cases involving Annex V violations had been forwarded by the State Department to flag states. The response to these referrals, however, has been poor. As of June, no response had been received in 76 cases, and of the 35 replies only two flag states reported imposing a penalty.

In view of this response, the Coast Guard, in consultation with the State Department, has changed its policy on handling cited violations. Under the new policy the United States will take direct enforcement action, consistent with international law, against foreign ships in U.S. ports that are suspected of having violated Annex V restrictions anywhere within the U.S. 200-mile Exclusive Economic Zone.

During the Marine Environment Protection Committee's 33rd session on 26-30 October 1992, the Coast Guard advised the Committee of the actions it had taken and the problems it had encountered. The Coast Guard requested that other nations also submit information to the Committee on their experiences with implementing and enforcing Annex V.

As a related problem, a number of member states have failed to submit mandatory reports on violations of Convention provisions, making it difficult to evaluate the effectiveness of its provisions. As a partial response, therefore, the Committee established a working group to revise its mandatory reporting forms for Convention violations. Further work on this matter is expected during the Committee's next meeting in July 1993.

Special Areas

When Annex V entered into force on 31 December 1989, its text listed five Special Areas in which particularly stringent discharge restrictions for ship-generated garbage were to apply (see Table 13). The five areas are the Mediterranean, Baltic, Black, and Red Seas, and the Persian Gulf/Gulf of Oman. Since then, Annex V has been amended to add three other areas to its list: the North Sea, the Antarctic area south of 60 degrees south latitude, and the Wider Caribbean Region, including the Gulf of Mexico.

The amendments to the Annex adding the Antarctic and Caribbean Special Areas became effective on 16 March and 2 October 1992, respectively. Contracting parties normally have one year from the date an amendment process is completed to revise their domestic regulations to reflect the change. At the end of 1992, the U.S. Coast Guard was in the process of developing proposed regulations to add both areas to the related U.S. rules.

Before Special Areas under Annex V can enter into force, contracting parties bordering a listed Special Area must affirm to the International Maritime Organization that adequate facilities to receive ship-generated garbage are available along the coastlines bordering the Special Areas. To date, this provision has been satisfied for only two of the eight listed Special Areas. These are the North Sea and the Antarctic area. For the other six areas, it is uncertain when the more restrictive discharge standards may take effect.

The nations bordering the North Sea Special Area advised the organization that port reception facilities for garbage were in place when the amendment to add that area was first proposed in 1990. With regard to the Antarctic area, special conditions apply because of the unique environment and the special waste disposal restrictions on the Antarctic continent (see Chapter V). In view of these circumstances, the proposal to add the Antarctic Special Area explicitly noted that the port reception facility requirements mandated for other special areas should not apply to stations and bases on the Antarctic continent.

To address this point, the amendment adding the Antarctic Special Area included measures requiring that flag states ensure that vessels flying their flag in the Antarctic Special Area have storage space to retain ship-generated garbage that cannot be discharged while in the area. Vessels also must have made arrangements for proper disposal of accumulated wastes upon leaving the area. Given the lack of port reception facility requirements for the Antarctic Special Area, the more restrictive standards for this area became effective immediately after completion of the listing process on 17 March 1992.

Port Reception Facility Guidelines

At the 25th session of the Marine Environment Protection Committee in September 1988, the Committee adopted guidelines providing advice on steps to implement Annex V. Among its key parts, the guidelines include sections on training and education, provisioning ships to minimize the generation of garbage, port reception facilities, and procedures for handling, processing, and storing garbage aboard ships. As noted in previous annual reports, the Marine Mammal Commission drafted the initial U.S. paper recommending development of the guidelines. It also drafted the section of the guidelines on shipboard handling, processing, and storage procedures.

Because of the difficulty in enforcing garbage discharge restrictions at sea (in part due to the large ocean area to be patrolled and limited number of enforcement officers) and the necessary reliance on voluntary compliance by all seafarers, the section on port reception facilities is particularly important. Without adequate, convenient, readily available facilities in ports, ships' crews will have difficulty meeting and may even resist regulatory measures. For this reason, sound advice on how to develop adequate port reception facilities for garbage is a fundamental need if Annex V is to be effective.

When the guidelines for Annex V were written in the mid-1980s, however, little information was available on port reception facilities for garbage, and the section on this subject was necessarily brief. Recognizing the importance of adequate port reception facilities, the U.S. Marine Entanglement Research Program and other groups supported work late in the 1980s to address port needs. The results of these efforts were examined during the Second International Conference on Marine Debris in April 1989.

In light of these developments, the Marine Mammal Commission drafted a paper for the Marine Environment Protection Committee, recommending that the guidelines section on port reception facilities be updated and expanded. In particular, it suggested that the section be revised to include new advice on matters such as administrative arrangements and procedures for establishing port reception facilities, the types and costs of reception facility equipment, space and siting considerations for equipment and garbage storage, how to notify vessel operators of the availability and use of reception facilities, and projecting the types and amounts of garbage likely to be returned to port.

The draft paper was provided to the Coast Guard, which agreed with most of the points and recommendations it contained. The Coast Guard submitted the paper with some modifications for the Committee's 30th session in November 1990. The Committee agreed to consider recommended changes and the U.S. delegation offered to draft a new section on port reception facilities. The Marine Entanglement Research Program, in consultation with the Coast Guard, subsequently contracted for a report on possible revisions, building on the points included in the paper drafted by the Commission. The Coast Guard submitted the resulting report to the Committee for the 31st session in July 1991.

Rather than taking up the report's recommendations, however, the Committee deferred action in light of a proposal by The Netherlands recommending that a comprehensive manual be developed to provide advice on port reception facility needs for all types of ship-generated wastes regulated under the Convention (*i.e.*, oily wastes, noxious liquid substances, and garbage). The Netherlands subsequently prepared a paper expanding on its proposal for the 32nd session of the Committee in March 1992. Based on that paper, the Committee established a working group to develop a comprehensive manual on port reception facilities and agreed to convene an intercessional meeting to speed its preparation.

The contractor who prepared the U.S. report on port reception facilities participated in the intercessional meeting held on 24-25 June 1992 in The Hague, The Netherlands, and in the working group meeting held at the 33rd session of the Committee on 26-31 October 1992. Based on progress made at the latter meeting, the chairman of the working group advised the Committee that the group expects to complete work on the manual at the 34th session in July 1993.

The Committee took note of the progress and expressed appreciation to the U.S. delegation for its

particularly helpful input regarding Annex V. It is expected that points put forth in the U.S. report on port reception facilities will be reflected in the new manual. When a draft is completed and accepted by the Committee, it will be circulated for review by Committee members.

Related Actions

Marine Debris Survey Manual

In 1986 a representative of the Marine Mammal Commission participated in the sixth session of the Intergovernmental Oceanographic Commission's Working Committee on the Global Investigation of Pollution in the Marine Environment (GIPME). Among other activities, the Committee oversees development and testing of manuals related to monitoring the levels of different marine contaminants. Its objectives in this regard are to encourage common pollution monitoring methodologies that allow comparison of data collected independently in different ocean areas at different times on the levels and distribution of particular types of contaminants.

During the Committee's sixth session, the Commission's representative reviewed new information on the effects of marine debris. Because marine debris had not been addressed in the Committee's series of pollution monitoring manuals, it was suggested that a new manual be prepared to provide advice on methodologies to monitor that contaminant. Among other points, it was noted that such a document would enhance efforts to collect data needed for evaluating the effectiveness of mitigation measures, such as those envisioned under Annex V. The Committee agreed and asked its Group of Experts on Methods, Standards, and Intercalibration to consider the matter.

To assist that group, the U.S. Marine Entanglement Research Program, at the recommendation of the Marine Mammal Commission, contracted for preparation of a marine debris survey manual. Under the contract, a final draft report was provided to the Committee's Group of Experts, the Marine Mammal Commission, and others for review late in 1990. In 1992, the "Marine Debris Survey Manual" was published by the National Oceanic and Atmospheric Administration as part of its Technical Report series. The manual includes chapters on methodologies for shipboard sighting surveys of large floating debris, shipboard trawling surveys for small debris, beach surveys, and surveys of debris on the sea floor.

The manual was very well done, and by letter of 24 June 1992 the director of the Marine Entanglement Research Program forwarded the document to the National Science Foundation representative serving as chairman of the GIPME Working Committee. In the letter it was recommended that the manual be submitted as a U.S. contribution to the Intergovernmental Oceanographic Commission's series of marine pollution monitoring system reports. The letter also suggested that procedures in the manual be tested through an intercalibration exercise in the Wider Caribbean Area.

On 1 July 1992 the Marine Mammal Commission also wrote to the National Science Foundation representative in support of the document's submission. As planning had begun for the eighth session of the GIPME Working Committee in 1993 in the Caribbean region, the Commission also recommended that matters pertaining to the manual be placed on the agenda for the Committee's next meeting and that the primary author of the manual be included on the U.S. delegation to that meeting to help address related matters that might arise.

On 8 July 1992 the National Science Foundation representative, acting as chairman of the GIPME Working Committee, forwarded the Marine Debris Survey Manual to the Intergovernmental Oceanographic Commission's senior assistant secretary for the marine pollution research and monitoring unit. Noting that the draft manual had been reviewed and endorsed by the Committee's Group of Experts at its meeting in 1990, the chairman recommended that the document be added to the Intergovernmental Oceanographic Commission's series of manuals and distributed internationally to appropriate research organizations, government agencies, *etc.*

As of the end of 1992 it was the Marine Mammal Commission's understanding that the topic of marine debris would be added to the agenda of the Working Committee's eighth session; advice on conducting an

intercalibration exercise to test the manual's procedures in the Wider Caribbean Region would be discussed under that agenda item; and steps were being taken to add the manual's primary author to the U.S. delegation for the meeting.

Second Wider Caribbean Marine Debris Workshop

On 17-19 August 1992 the Intergovernmental Oceanographic Commission's Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE) convened a second regional marine debris workshop at the Center for Advanced Investigations and Studies in Merida, Mexico. The first such workshop had been held in La Parguera, Puerto Rico, on 30 April 1991. The purpose of the second workshop, in which the Marine Mammal Commission participated, was to review progress following the first meeting. Specifically, workshop participants were charged with reviewing recent research and management activities concerning marine debris pollution in the Wider Caribbean Region and identifying future work that should be undertaken within the context of the Caribbean Environment Program. Scientists, resource managers, and industry representatives from nine countries, including the United States, participated.

A major task at the workshop was to review and recommend changes to complete a marine debris action plan for the Wider Caribbean Region that had been drafted by the IOCARIBE Secretariat. The purpose of the plan is to develop a cooperative regional strategy to assess and control marine debris pollution. The final plan, as modified to reflect results of the workshop, identifies 10 cooperative actions that include designing and implementing a regional outreach/public awareness campaign, encouraging wider use of recycling programs, developing strategies to handle garbage generated by cruise ships, organizing regional beach clean-ups, encouraging more Caribbean nations to ratify Annex V of the Convention for the Prevention of Pollution from Ships, and building a regional marine debris monitoring network.

The completed action plan is to be presented to appropriate regional organizations and governments to help encourage and direct support towards priority work. In particular, the plan was to be submitted to the 10th meeting of the monitoring committee on the action plan for the Caribbean Environment Program in November 1992 and to the fourth session of the Intergovernmental Oceanographic Commission's Sub-Commission for the Caribbean and Adjacent Regions in December 1992.

As of the end of 1992 the Marine Mammal Commission had not yet been advised of actions taken at these meetings relative to the recommended plan. However, support to begin work on several projects identified in the plan has been provided by several U.S. agencies, including the Coast Guard (for work to encourage ratification of Annex V), and the Marine Entanglement Research Program (for work on a public outreach and awareness program).

Chapter VIII

MARINE MAMMAL MANAGEMENT IN ALASKA

Marine mammal conservation in Alaska presents an extraordinary challenge. Contributing to the complexity of marine mammal issues are the large populations of several species within and adjacent to State waters, the State's extensive and often remote coastline, the use of marine mammals by Alaska Natives for subsistence purposes, and interactions with fisheries and coastal and offshore oil and gas development.

In 1992 the Commission continued to devote attention to a number of critical issues in Alaska and surrounding areas. Of particular importance were the development of species accounts, conservation plans, and recovery plans for several species of Alaska marine mammals; a marking and tagging program to collect data on Native subsistence harvests and prevent illegal taking and trade in marine mammal products; assessment of possible changes in environmental conditions in the Gulf of Alaska and Bering Sea ecosystems; and measures to predict, detect, and mitigate possible effects on marine mammals of offshore oil and gas activities. The first two topics are addressed below; the Gulf of Alaska/Bering Sea ecosystems and oil and gas exploration are discussed in Chapters IV and IX, respectively.

Species Accounts, Conservation Plans, and Recovery Plans

The Marine Mammal Protection Act amendments of 1988 direct the Secretaries of Commerce and the Interior to develop conservation plans for depleted marine mammal species or populations. Congress also suggested that the Secretaries consider developing conservation plans for non-depleted species that would benefit from such documents. Conservation plans are similar to the recovery plans required for species listed under the Endangered Species Act. They provide a framework for planning research and management actions needed to further conservation objectives. In this regard, the Marine Mammal Commission has provided advice and assistance to the National Marine Fisheries Service and the Fish and Wildlife Service to help develop and implement plans for several species.

In 1988 species accounts with research and management recommendations for 10 species of Alaska marine mammals were published by the Commission (see Appendix B, Lentfer 1988). These accounts were forwarded to the Fish and Wildlife Service and the National Marine Fisheries Service to help the agencies evaluate and improve research and management programs for each species. In its letter transmitting the final published report to the Fish and Wildlife Service, the Commission recommended that the accounts be used as the basis for developing conservation plans for polar bears, walruses, and sea otters. The Commission's letter to the National Marine Fisheries Service included a similar recommendation regarding the Steller sea lion account. The Fish and Wildlife Service initiated management planning efforts for polar bears and walruses in 1989 and for sea otters in 1990, and as an initial step set up management plan advisory teams. Team meetings were held, and as discussed in previous annual reports, some progress was made on drafting management plans.

Subsequently the Fish and Wildlife Service advised the Commission that it had initiated preparation of conservation plans for polar bears, walruses, and sea otters. During the Commission's 1991 annual meeting in Bellevue, Washington, representatives of the Service updated the Commission on the status of its efforts. The Service noted that because of the March 1988 *Exxon Valdez* oil spill, little progress had been made on drafting the plans. To help speed their development the Commission offered to arrange for development of preliminary draft plans for each species. The Service agreed and, as discussed in

Chapter III, by the end of 1992 preliminary draft conservation plans for all three species had been completed and provided by the Commission to the Service. The Service has circulated the drafts to species management teams established by the Service to assist it in the planning process. All three plans are expected to be completed in 1993.

In the 1988 amendments to the Marine Mammal Protection Act, Congress directed the National Marine Fisheries Service to develop conservation plans for northern fur seals by 31 December 1989 and for Steller sea lions by 31 December 1990. A northern fur seal conservation plan was drafted in 1990 and revised in 1992, but has not yet been completed or adopted. In November 1990 the Service listed the Steller sea lion as threatened under the Endangered Species Act. Subsequently the Service established a recovery team, which drafted a Steller Sea Lion Recovery Plan. The Commission's Steller sea lion account was used as a source document during the planning process. The draft plan was distributed for review early in 1992 and was completed and adopted by the Service on 30 December 1992.

Also in 1992 in response to data indicating a significant decline in numbers of harbor seals in Alaska, the National Marine Fisheries Service contracted with the University of Alaska to prepare a draft harbor seal conservation plan. The Commission's 1988 harbor seal species account is expected to be a source document for this effort. As of the end of 1992, drafting of the harbor seal plan had not yet begun. Further discussion of issues important for conserving harbor seals, northern fur seals, and Steller sea lions is included in Chapter II.

Recent data on harbor seals and killer whales in Alaska led the Marine Mammal Commission to conclude that its 1988 species account for Alaska harbor seals should be updated and that a species account for Alaska killer whales should be developed. Each is due to be completed early in 1993. They will provide a synthesis of up-to-date information on each species and will include recommendations to assist the National Marine Fisheries Service in advancing research and management goals.

On a related matter, in 1991 the Service completed and approved a recovery plan for humpback whales, including populations that occur seasonally in Alaska waters. Further discussion of these species as well as activities related to bowhead whales is provided in Chapter III.

Federal Marine Mammal Marking and Tagging Regulations

In 1981 the Marine Mammal Protection Act was amended to give the Fish and Wildlife Service and the National Marine Fisheries Service authority to promulgate regulations requiring the marking, tagging, and reporting of marine mammals taken by Alaska Natives. Two purposes of the amendment were to make it possible to obtain better information on the numbers and species of marine mammals taken for subsistence and handicraft purposes and to help prevent illegal trade in products from those species.

Marking and tagging regulations were issued by the Fish and Wildlife Service on 28 June 1988. They require that within 30 days of taking any polar bear, walrus, or sea otter the Native hunters must report the take to the Service and present specified parts of the animal to be marked and tagged. Polar bear and sea otter skins and skulls and walrus tusks must all be marked or tagged. Reports from hunters are to include, among other things, the date and location of the take and the sex of the animal taken. Raw, unworked, or tanned parts from these three species taken between 21 December 1972 (the date the Marine Mammal Protection Act became effective) and 26 October 1988 (the effective date of the regulations) that had not yet been converted into handicrafts or clothing were required to be presented to the Service for marking by 24 April 1989. Possession or transportation of unmarked marine mammal parts, except as authorized, is a violation of the Act.

Since promulgating its regulations, the Service has worked closely with Native groups and the State of Alaska to implement the marking and tagging program. At present, 104 individuals in 85 coastal villages have been trained and authorized to tag parts from marine mammals taken by Alaska Natives and to

Table 14. Number of sea otters, walruses, and polar bears presented for marking and tagging by Alaska Natives, 1988-1992

Year[1]	Sea Otters	Walruses	Polar Bears
Pre-rule[2]	499	1,467	123
1988[3]	55	6	132
1989	268	736	99
1990	166	1,458	74
1991	236	2,143	59
1992[4]	620	1,527	—

1 Sea otter and walrus data are provided on a calendar year basis. Polar bear data are provided on the basis of the harvest year, which runs from 1 July of the year indicated to 30 June of the following year.
2 "Pre-rule" refers to stocks of raw, unworked, or tanned marine mammal parts from animals taken between 21 December 1972 and 26 October 1988 and still held by Native hunters when the regulations became effective.
3 Figures include only marine mammals taken after 26 October 1988. Figures for polar bears include those animals taken between 26 October 1988 and 30 June 1989.
4 Preliminary estimates only. Receipt of harvest certificates for 1992 may not be complete.

collect information on the harvested animals. The authorized taggers include Native village residents working under contract to the Service as well as Service employees in Anchorage and at National Wildlife Refuges. Data obtained from the marking and tagging program are maintained by the Service in a computerized database.

In 1991 the Service changed the way in which it maintains polar bear data. While data for sea otters and walruses are maintained on a calendar year basis, polar bear data are recorded by harvest year, which runs from 1 July to 30 June. This change was made to facilitate comparison of recent polar bear data with data from past years.

Data on the number of marine mammals tagged under the Fish and Wildlife Service's program through 1992 are presented in Table 14. Reporting for 1992 is not yet complete and data from this year should be considered as preliminary.

To date, the National Marine Fisheries Service has not promulgated marking and tagging regulations for those species under its jurisdiction that are taken by Alaska Natives for subsistence or handicraft purposes.

Litigation Related to Marine Mammals in Alaska

Katelnikoff Beck et al. v. *U.S. Department of the Interior*

The *Katelnikoff* lawsuit was originally filed in 1985 in the U.S. District Court for the District of Alaska. The Fish and Wildlife Service had confiscated certain handicraft items made of sea otter pelts (*i.e.*, teddy bears, hats and mittens, fur flowers, and pillows) from the plaintiff, an Aleut resident of Kodiak Island, because the items were not of a type commonly made by Alaska Natives prior to enactment of the Marine Mammal Protection Act in 1972. The plaintiff challenged the Service's regulatory definition of "authentic native articles of handicrafts and clothing." That definition limited the Act's Native exemption to traditional handicrafts commonly made by Alaska Natives on or before the effective date of the Act. The plaintiff argued that the Act preserved the right of Alaska Natives to take marine mammals for handicraft purposes regardless of whether such items had been commonly made before the Marine Mammal Protection Act took effect.

On 16 June 1986 another Alaska Native, from whom the Service also had confiscated items handcrafted from sea otter pelts, moved to become a plaintiff-intervenor in the case. Shortly after the motion to intervene was granted, the court issued a ruling in favor of the Service. In a 21 July 1986 opinion, the court held that the language of the Act and its legislative history supported establishing 1972 as a cutoff date in the regulations. In light of that ruling, the original plaintiff agreed to dismiss her claims. The plaintiff-intervenor, however, filed an amended complaint in October 1987, claiming that the regulation was unconstitutionally vague because it did not provide sufficient guidance to determine what handicrafts were or were not commonly produced from sea otters before 21 December 1972.

On 27 June 1988 the court issued an order stating that it would consider the new challenge. In its order the court described the Service's position as to permissible uses of sea otter pelts as a "moving target" and strongly implied that the regulatory definition would be found to be void for vagueness. The court therefore suggested that the Service undertake an administrative review to determine if the use of sea otters for handicrafts by Natives calls for a special regulation or at least a supplementary interpretation of the handicraft definition as it applies to sea otters.

The Service followed the court's advice. On 20 April 1990 after an extensive public comment period, it issued a rule providing additional guidance on allowable uses of sea otters in the making and selling of traditional handicrafts and clothing. The amended definition of "authentic native articles of handicrafts and clothing" clarified that no items created in whole or in part from sea otters fit within the definition. Under the amended regulation, no sea otter handicrafts could be sold.

The plaintiff-intervenor challenged the legality of the rule and filed a motion on 17 July 1990 seeking to enjoin enforcement of the new regulatory interpretation. The original plaintiff in the lawsuit joined in that challenge. The Alaska Sea Otter Commission also filed suit, challenging the Service's new regulation. These challenges were later consolidated into a single lawsuit.

The plaintiffs contended that the regulation was inconsistent with the rulemaking record, which they alleged supported the view that trade, barter, and other economic uses of sea otter handicrafts and clothing by Alaska Natives before 1972 were extensive. In addition, plaintiffs reasserted their earlier argument that the 1972 cut-off date for determining whether handicrafts had been traditionally made was inconsistent with the Marine Mammal Protection Act and its legislative history. Friends of the Sea Otter, which had supported adoption of the new regulation, was granted intervenor status in the case.

The court issued its opinion on 17 July 1991, ruling in plaintiffs' favor. In so doing, the court noted that "it was on the wrong track" when it initially upheld the regulation in 1986. Upon reexamining the matter, the court found that no deference was due the Service's regulatory definition of "authentic native articles of handicrafts or clothing" inasmuch as Congress had already defined that term in section 101(b)(2) of the Marine Mammal Protection Act. Applying the statutory definition, the court found that as long as the underlying taking was not wasteful, the Act exempted all Native handicrafts produced from non-depleted marine mammals using traditional methods (*e.g.*, weaving, carving, stitching, sewing, beading, drawing, and painting) whether or not such handicrafts had traditionally been produced. Therefore, the court invalidated the Service's regulation.

The Federal defendants filed a protective notice of appeal in the case on 5 November 1991, but later moved to dismiss its appeal, in essence acquiescing in the district court ruling. Friends of the Sea Otter filed a notice of appeal on 7 November 1991. Inasmuch as Friends of the Sea Otter had participated in the district court case as an intervenor, the Federal government challenged the ability of that group to pursue the appeal, claiming that, absent a government appeal, Friends of the Sea Otter could not seek to defend the handicraft regulation. The Federal government also argued that Friends of the Sea Otter had not established the requisite standing to sustain an appeal.

The United States Court of Appeals for the Ninth Circuit issued its opinion in the matter on 28 December 1992. The court ruled that Friends of the Sea Otter had a sufficient interest in the matter to satisfy the jurisdictional and standing requirements for an appeal. The court then addressed the merits of the case, affirming the lower court ruling. The court found that the Marine Mammal Protection Act places two requirements on what constitutes authentic native articles of handicrafts and clothing: "(1) they must be made at least in part from 'natural materials' and (2) the type of production must be done in traditional native ways, such as weaving, carving, and stitching, but not through methods of mass production." It found no basis for the additional requirement that handicraft items be of a type made and sold prior to 1972. "Application of the 1972 cut-off," the court stated, "results in the artificial and unintended exclusion of any uses of sea otters" for making and selling handicrafts.

Alaska Wildlife Alliance v. *Jensen*

Under National Park Service regulations adopted in 1985 to protect humpback whales, the numbers of cruise ships and other vessels permitted to enter Glacier Bay National Park during the summer whale season is limited. Under those regulations, no more than 107 cruise ships may be allowed to enter the park each summer.

In 1990 the Service authorized 109 cruise ship entries into Glacier Bay. At that time, the Commission and others questioned the procedures used by the Service to authorize entries in excess of the 107-entry ceiling imposed by the Service's own regulations. On 21 August 1990 the Alaska Wildlife Alliance filed a complaint challenging the National Park Service's decision to authorize the two additional cruise ship entries. The plaintiff alleged that the Service, in authorizing those entries, did not follow applicable procedures, exceeded the maximum allowable number established by regulation, and violated the National Environmental Policy Act by not preparing a supplemental environmental assessment. Plaintiffs, however, did not seek injunctive relief, and none of the cruise ship entries authorized for 1990 were enjoined. As noted in the previous annual report, 107 cruise ship entries into Glacier Bay were authorized in 1991.

The plaintiffs also alleged that commercial fishing operations being conducted in Glacier Bay violated applicable law, and in combination with tour boat operations, may be having adverse effects on humpback whales and other cetaceans. The Park Service recognized that it had not properly authorized commercial fishing operations in the park, and by *Federal Register* notice of 5 August 1991 proposed regulations authorizing certain fishing activities in park waters through 1997.

Parties to this lawsuit met in 1991 to try to negotiate a settlement in the case. Inasmuch as the Service is revising the vessel management plan for the park, the parties agreed to stay consideration of the claims involving vessel entries. The parties agreed to proceed on the issue of whether the Service may allow commercial fishing in the park. Briefing of the case is expected to be complete early in 1993.

United States v. *F/V Distant Water*

As discussed in the Pacific walrus section in Chapter III, in 1989 the National Marine Fisheries Service adopted a two-year seasonal fishery closure around Cape Peirce, Round Island, and the Twins Islands under the Magnuson Fishery Conservation and Management Act. On 25 June 1991 the defendant fishing vessel was found fishing within the closed area surrounding Round Island. Further investigation revealed that the vessel also had violated the closure regulations on two earlier occasions. Subsequently the National Oceanic and Atmospheric Administration filed a complaint seeking forfeiture of the vessel and its catch.

On 12 August 1991 the defendant filed a motion for summary judgment or, alternatively, to dismiss the complaint. In support of its motion, the defendant argued that the regulations establishing the closure were beyond the scope of the Magnuson Act and were therefore invalid. Specifically, the defendant contended that while the Magnuson Act authorized the regulation of fisheries for the conservation and management of fishery resources, marine mammals were expressly excluded from coverage under the Act. They further asserted that the Marine Mammal Protection Act provided the exclusive mechanism for regulating the taking of marine mammals incidental to commercial fisheries. Inasmuch as the challenged regulations were promulgated solely to protect walruses and not fishery resources and had not been issued pursuant to the Marine Mammal Protection Act, the defendant claimed they should be found to be invalid.

Federal prosecutors responded that the regulations were a proper exercise of the Service's authority under the Magnuson Act. As evidence of Congressional intent to allow regulation of fisheries for purposes other than managing fishery resources, prosecutors pointed to the Act's definition of the term "conservation and management," which includes those measures "required to rebuild, restore, or maintain... any fishery resource and the marine environment... and...designed to assure that...irreversible or long-term adverse effects on fishery resources and the marine environment will be avoided...." Similarly the Magnuson Act's allowance for consideration of any relevant "economic, social, or ecological factor" when

determining optimum yield was cited as evidence that the scope of the Act went beyond fishery resources. Prosecutors also pointed to section 114(g)(3) of the Marine Mammal Protection Act, which directs the Secretary of Commerce to request that the Fishery Management Councils established under the Magnuson Act take actions necessary to mitigate adverse impacts to marine mammals from fisheries under certain circumstances, to support the view that regulation of fisheries to protect marine mammals or other non-fishery resources is appropriate. Moreover, section 114(g)(3) specifically includes adjustments to requirements with respect to fishing times and areas as possible actions that might be taken by the Councils to protect marine mammals.

The court ruled from the bench at a 10 January 1992 hearing, upholding the Service's regulations as a proper exercise of its authority under the Magnuson Act. No written opinion was published in this case.

Trustees for Alaska v. *Lujan*

Trustees for Alaska filed suit on 8 August 1990 seeking to halt oil and gas exploration activities being conducted in the Chukchi Sea, alleging that unauthorized takings of walruses had and would continue to occur. This lawsuit, originally filed with the Ninth Circuit Court of Appeals, was refiled with the District Court for the District of Alaska on 19 February 1991 after the appellate court ruled that it did not have original jurisdiction of the matter under the Outer Continental Shelf Lands Act, as plaintiffs had argued.

The plaintiff's complaint alleged that exploratory drilling activities authorized by the Minerals Management Service were likely to take walruses in violation of the Marine Mammal Protection Act if conducted in the vicinity of the retreating or advancing ice edge. The plaintiff also noted that although the oil companies operating in the Chukchi Sea had requested authorization from the Fish and Wildlife Service for the incidental take of small numbers of walruses and polar bears under section 101(a)(5) of the Act, such authorization had yet to be issued. A motion for summary judgment was filed by the plaintiff on 14 May 1991. Federal defendants filed a cross-motion for summary judgment on 14 June 1991, contending that the plaintiff had not sufficiently demonstrated that walruses would be taken if the exploratory activities were allowed to proceed.

While the summary judgment motions were pending, the Fish and Wildlife Service completed its rulemaking and issued letters of authorization pursuant to section 101(a)(5) of the Marine Mammal Protection Act authorizing the taking of walruses and polar bears incidental to oil and gas exploration in the Chukchi Sea. Consequently on 2 July 1991 Federal defendants filed a motion to dismiss the case as being moot. The court granted that motion and on 1 April 1992 dismissed the case.

Greenpeace v. *Franklin*

Greenpeace and other environmental groups filed suit on 26 June 1991 seeking to invalidate the 1991 pollock harvest level adopted by the National Marine Fisheries Service. Plaintiffs alleged that the quotas established for the pollock fishery violated section 7 of the Endangered Species Act and the National Environmental Policy Act. On 29 December 1992 the Ninth Circuit Court of Appeals upheld a district court ruling that the Federal defendants had satisfied the requirements of those statutes. Further discussion of this case is provided in the Steller sea lion section of Chapter III.

"Operation Whiteout"

A two-year undercover investigation by Fish and Wildlife Service agents, known as "Operation Whiteout," resulted in the indictment of 29 individuals during 1992 for violations of the Marine Mammal Protection Act, the Lacey Act, and Federal drug and conspiracy laws. Charges against four of those individuals were later dropped.

Among the alleged violations were the wasteful taking of walrus (*i.e.*, headhunting) and the illegal sale of marine mammal parts. Other charges involved the exchange of marine mammal parts for drugs. Of the cases pursued by Federal prosecutors, all resulted in convictions or guilty pleas. The 25 defendants were convicted on a total of 67 counts, including 20 misdemeanor violations of the Marine Mammal Protection Act and 20 felonies and 6 misdemeanors

under the Lacey Act. All were based on underlying violations of the Marine Mammal Protection Act. Fifteen defendants received jail sentences, including the captain of a walrus hunting crew videotaped engaging in headhunting. The captain's 15-month jail sentence is believed to be the stiffest penalty ever handed down for misdemeanor violations of the Marine Mammal Protection Act. Four defendants have appealed their convictions.

Other possible violations of Federal law are being investigated as part of "Operation Whiteout."

Chapter IX

OUTER CONTINENTAL SHELF OIL AND GAS DEVELOPMENT

Exploration and development of coastal and offshore oil, gas, and hard mineral resources may adversely affect marine mammals and the ecosystems of which they are a part. Under the Outer Continental Shelf Lands Act, the Department of the Interior's Minerals Management Service is responsible for assessing, detecting, and mitigating the adverse effects associated with such activities in offshore waters beyond state jurisdiction. Under the Marine Mammal Protection Act and the Endangered Species Act, the National Marine Fisheries Service and the Fish and Wildlife Service are responsible for reviewing proposed actions and advising the Minerals Management Service and other agencies of measures needed to ensure that those actions will not have adverse effects on marine mammals or endangered or threatened species. The Commission reviews relevant policies and activities of these agencies and recommends actions that appear necessary to protect marine mammals and their habitats. The Commission's activities in this regard in 1992 are discussed below.

Proposed Offshore Lease Sales

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviews and comments on environmental impact statements and other matters concerning proposed outer continental shelf oil, gas, and hard mineral lease sales. During 1992 the Commission commented to the Minerals Management Service on proposed lease sales in the Gulf of Mexico and on requests for information on possible lease sales in the St. George Basin, Alaska, and the Gulf of Alaska-Yakutat area.

Oil and Gas Lease Sales #142 and 143, Central and Western Gulf of Mexico

Proposed lease sale #142, tentatively scheduled for March 1993, involves up to 5,194 blocks (approximately 28 million acres) of submerged lands in the central Gulf of Mexico. Proposed sale #143, tentatively set for August 1993, involves the lease of 4,715 blocks (about 25.8 million acres) in the western Gulf. In April 1992 the Minerals Management Service issued a draft environmental impact statement on the proposed lease sales and distributed it to the Marine Mammal Commission and others for review.

The draft statement noted that 30 species of marine mammals, including the endangered West Indian manatee and six species of endangered whales, have been observed in the northern Gulf of Mexico. Of these, the sperm whale is the most common endangered marine mammal in the proposed lease sale areas. The most common non-endangered marine mammal species in the area is the bottlenose dolphin; several distinct populations of the species may exist in the Gulf.

The draft statement concluded that all alternatives under consideration would have "sublethal, chronic effects" on both endangered and non-endangered marine mammal species. It further concluded that the proposed action, combined with other activities in the affected areas, cumulatively could cause declines or changes in the distribution of both endangered and non-endangered marine mammals, and that such changes could last more than a generation.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the draft statement, and by letter of 2 July 1992 provided comments to the Service. In its letter the Commission noted that, while the conclusions presented in the draft statement may be correct, the statement did not provide data, analyses, or literature citations to support many of them. The draft statement concluded, for example, that production waters, drilling muds, drilling noises, *etc.*, will not affect marine mammal food supplies, but it provided no information on the diet, feeding areas, or food requirements of the various marine mammals that occur in and near the proposed lease sale areas.

The Commission noted that since the draft statement was written, unusually high numbers of bottlenose dolphins had died and washed ashore along the Texas coast, and that the National Marine Fisheries Service was attempting to determine the cause and biological significance of the event. The Commission recommended that, if the Minerals Management Service had not already done so, it consult with the National Marine Fisheries Service to obtain the best available information concerning this unusual mortality and the discreteness, status, seasonal movement patterns, food habits, and sources of non-natural mortality of bottlenose dolphins in the northern Gulf of Mexico.

The Commission also noted that it may be prohibitively expensive, if not impossible, to obtain the information necessary to accurately predict the possible impacts on every species that could be affected by activities related to the proposed lease sale. The Commission reiterated suggestions made with respect to previous lease sales that in some cases the intents and provisions of the Marine Mammal Protection Act might be accomplished more cost-effectively by designing and carrying out post-lease monitoring programs rather than exhaustive pre-lease assessment programs. In this regard, the Commission noted that section 20 of the Outer Continental Shelf Lands Act, as amended, requires that the Service conduct post-lease monitoring to detect and determine possible adverse effects, and that section 101(a)(5) of the Marine Mammal Protection Act provides that U.S. citizens engaged in offshore oil and gas activities can be exempted from the taking prohibitions of the Act provided that certain conditions are met and that provisions have been made to monitor and report the taking. Among other things, the Commission recommended that the draft statement be expanded to indicate what will be done to meet the section 20 monitoring requirements and to ensure that lessees are aware of pertinent provisions of the Marine Mammal Protection Act.

Proposed OCS Lease Sale #153 St. George Basin, Alaska

On 1 April 1992 the Minerals Management Service issued a call for information and notice of intent to prepare an environmental impact statement on a proposed lease sale in the St. George Basin, Alaska. The sale, tentatively scheduled for December 1994, would involve lease of approximately 2,149 blocks (about 12 million acres) of submerged lands 15 to 130 miles offshore of the Aleutian Islands.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the notice and call for information, and by letter of 12 May provided comments to the Service. In its letter the Commission noted that 23 species of marine mammals are known to occur at least seasonally in the St. George Basin. These include eight species of endangered whales (right, bowhead, blue, fin, sei, humpback, gray, and sperm), the Steller sea lion (listed as threatened under the Endangered Species Act) and the northern fur seal (listed as depleted under the Marine Mammal Protection Act). In addition, the Commission noted that the number of harbor seals has declined substantially in much of the species' Alaska range, and that if the decline continues, the Alaska population or populations of harbor seals could be listed as depleted, threatened, or endangered.

The Commission recommended a number of actions to ensure protection of these species. For example, the Commission recommended that, if the Minerals Management Service had not already done so, it should contact the National Marine Fisheries Service and Alaska Department of Fish and Game to (1) obtain the best available information on Steller sea lion rookeries and feeding areas that might be affected by activities in the proposed sale area, and

(2) determine the additional research and monitoring programs, if any, that would be required to accurately assess and detect the possible effects of oil and gas exploration and development on Steller sea lions.

The Commission also recommended that the Minerals Management Service consult with the Fish and Wildlife Service to (1) determine what actions the Minerals Management Service should take to help implement the Walrus Conservation Plan being developed by the Fish and Wildlife Service, and (2) obtain the best available information on sea otter distribution, abundance, and trends in and near the proposed St. George Basin lease sale area and determine how it might assist in implementing the Alaska Sea Otter Conservation Plan also being developed by the Service. The Commission further recommended that the Minerals Management Service consult with the National Marine Fisheries Service, the Fish and Wildlife Service, and the Alaska Department of Fish and Game to identify long-term monitoring studies that may be necessary or desirable to ensure that oil and gas exploration and development do not disadvantage marine mammals. Lastly, the Commission recommended that the Minerals Management Service develop a "Notice to Lessees" describing and indicating what must be done to comply with the relevant provisions of the Marine Mammal Protection Act.

Proposed Lease Sale #158, Gulf of Alaska - Yakutat

On 21 August 1992 the Minerals Management Service announced its intention to prepare an environmental impact statement on proposed OCS lease sale #158 in the Gulf of Alaska-Yakutat area. At the same time, the Service requested information and comments on environmental, biological, and other factors that might bear on potential leasing and development in the area. The sale, tentatively scheduled for mid-1995, would cover about 1,307 blocks (or approximately 7.2 million acres) 3 to 70 miles offshore in water depths ranging to more than 13,000 feet.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the call for information and by letter of 5 October 1992 forwarded comments to the Service. In its letter the Commission noted that 17 species of marine mammals are known to occur at least seasonally in the Gulf of Alaska and surrounding areas. These include seven species of endangered whales, the Steller sea lion (listed as threatened under the Endangered Species Act) and the northern fur seal (designated as depleted under the Marine Mammal Protection Act). The Commission indicated that the species of greatest concern are the Steller sea lion, the northern fur seal, the harbor seal, the right whale, and the sea otter. It noted that three other species — the gray whale, humpback whale, and killer whale — also merit special attention.

The Commission recommended that the Minerals Management Service take a number of actions to ensure the necessary protection of these species. Specifically, the Commission recommended that if the Minerals Management Service had not already done so, it should consult with the National Marine Fisheries Service and the Alaska Department of Fish and Game to (1) obtain the best available information on Steller sea lion rookeries, haulout sites, feeding areas, prey species, and other essential habitat and habitat components that could be affected by oil and gas activities in the proposed lease sale area; (2) determine any additional research or monitoring programs that would be required to accurately assess and detect the possible effects of oil and gas exploration and development; and (3) identify measures that could be taken to avoid or mitigate possible adverse effects on Steller sea lions.

With respect to harbor seals, the Commission recommended that the Minerals Management Service consult with the National Marine Fisheries Service to (1) obtain the best available information on harbor seal distribution, abundance, and trends in and near the proposed lease sale area; (2) determine any additional research or monitoring programs that would be required to accurately assess and detect the possible effects of oil and gas exploration and development on the species; and (3) identify measures that could be taken to avoid or mitigate possible adverse effects. With respect to sea otters, the Commission recommended that the Minerals Management Service consult with the Fish and Wildlife Service and the Alaska Department of Fish and Game to (1) obtain the best available information on sea otter distribution, abun-

dance, and trends in and near the proposed lease sale area; (2) obtain the best available information on types of prey eaten by sea otters and the distribution and abundance of key prey; and (3) determine what, if any, measures should be taken to assess and to be prepared to minimize and mitigate the possible direct and indirect effects of these activities on sea otters.

The Commission further recommended that the Minerals Management Service (1) consult with the National Marine Fisheries Service to determine what, if any, additional studies are necessary to assess, detect, and mitigate the possible effects of the proposed lease sale on gray, humpback, and killer whales, and (2) consult with the National Marine Fisheries Service, the Fish and Wildlife Service, and the Alaska Department of Fish and Game to identify long-term monitoring studies that may be necessary or desirable to ensure that oil and gas exploration and development do not disadvantage marine mammals.

Small-Take Exemptions

Section 101(a)(5) of the Marine Mammal Protection Act directs the Secretaries of the Interior and Commerce to authorize, upon request, the unintentional taking of small numbers of both depleted and non-depleted marine mammals incidental to activities other than commercial fishing operations. Before authorizing such takes, there must be a notice and opportunity for public comment and certain conditions must be met. In particular, the Secretary must find that the total of such taking will have a negligible impact on the affected species or stock, and will not have an unmitigable adverse impact on the availability of the species or stock for taking by Alaska Natives for subsistence uses.

The Secretary also must prescribe regulations setting forth permissible methods of taking that will cause the least practicable adverse impact on the species or stock and its habitat. Taking authorized by the regulations also must have the least practicable adverse impact on the availability of such species or stock for subsistence uses. The regulations also must set forth the requirements for monitoring and reporting any taking.

Promulgation of Regulations To Authorize the Incidental Take of Marine Mammals

On 3 October 1989 the National Marine Fisheries Service published in the *Federal Register* a proposed rule to authorize the non-lethal take of six species of marine mammals (bowhead, gray, and beluga whales and bearded, ringed, and spotted seals) incidental to oil and gas exploration activities in the Beaufort and Chukchi Seas from 1990 to 1995. A similar proposed rule governing the incidental take of walruses and polar bears was published by the Fish and Wildlife Service on 25 February 1991.

As noted in its previous annual report, the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, provided comments to the Services on the proposed actions. In its comments, the Commission noted that it was not clear that only "small numbers" of marine mammals would be authorized to be taken. The Commission recommended that the Services estimate the numbers of each species of marine mammal that might be taken and explain the basis of the determination that those numbers are "small." The Commission also recommended that the proposed rules be amended to provide the Commission and the public an opportunity to review and comment on monitoring plans and other aspects of specific requests for incidental take authorizations before letters of authorization are issued.

A final rule promulgating regulations governing small-take exemptions was issued by the National Marine Fisheries Service on 18 July 1990. The Fish and Wildlife Service published its final rule on 14 June 1991. In the Commission's view, neither rule adequately identified the monitoring requirements nor the criteria needed to judge the adequacy of monitoring plans submitted as part of requests for letters of authorization to take marine mammals incidental to oil and gas exploratory activities off Alaska. Likewise, neither rule reflected the independent requirements of Marine Mammal Protection Act section 101(a)(5) that (1) the incidental taking of only small numbers of marine mammals may be authorized; and (2) the taking may be authorized only if it would have a negligible impact on the affected species or stock.

By separate letters both dated 5 August 1991, the Commission conveyed its views to the Fish and Wildlife Service and the National Marine Fisheries Service. The Commission noted that while the Services may be unable to provide a precise formulation of what constitutes "small numbers," they nevertheless should be able to articulate, on a case-by-case basis, the rationale for determining that only small numbers of marine mammals will be taken incidental to authorized activities. The Commission recommended that as a matter of practice each request for a letter of authorization be reviewed to determine the number of marine mammals (by species and, as possible, age/size and sex) that could be taken in various ways if the activity proceeds as planned, and that letters of authorization subsequently issued should (1) specify when, where, how, and how many marine mammals may be taken incidentally in the course of the planned activities, and (2) require that the activities be suspended if the monitoring program indicates that marine mammals are being taken in ways or in numbers that are not authorized. The Commission also recommended that the National Marine Fisheries Service and the Fish and Wildlife Service initiate rulemaking to amend its definition of "small numbers" to clarify that this requirement is distinct from the "negligible impact" provision.

As discussed in the previous annual report, in February 1991 the National Marine Fisheries Service and the Minerals Management Service cooperatively convened a workshop, as recommended by the Commission, to develop guidelines for site-specific monitoring programs for the 1991 season. In its 5 August 1991 letters to the two Services, the Commission noted that, although the February 1991 workshop had been useful, it did not involve all interested parties or address all relevant issues. Therefore the Commission recommended that the National Marine Fisheries Service, the Fish and Wildlife Service, and the Minerals Management Service convene a follow-up workshop and that the workshop be held no later than the end of February 1992.

None of the agencies responded, and by letter of 21 November 1991 to the National Marine Fisheries Service, the Commission asked what was being done with regard to the recommended workshop. In its response on 6 December 1991, the Service noted that it was planning to hold a workshop late in February 1992 to review the results of the 1991 site-specific monitoring programs and to determine what changes should be made in the site-specific monitoring guidelines developed at the 1991 workshop. On 24 December 1991, the Fish and Wildlife Service responded to the Commission's 5 August letter concerning the Service's final rule regarding the incidental take of walrus and polar bears. The Service concurred with the Commission's recommendation that a workshop be held to define and determine how monitoring requirements can best be met, and it indicated that it would work with the National Marine Fisheries Service to organize the workshop.

The workshop on monitoring the effects on marine mammals of oil and gas exploration in the Arctic was held 10-11 March 1992 in Seattle, Washington. The meeting was organized by the National Marine Fisheries Service and participants included a member of the Marine Mammal Commission staff as well as representatives of other Federal agencies, the State of Alaska, the North Slope Borough, the Alaska Eskimo Whaling Commission, monitoring contractors, and the oil and gas industry. The purpose of the workshop was to provide guidance to the oil and gas industry in developing and implementing monitoring programs.

Prior to the workshop, the Commission prepared and provided to the Service a discussion paper on monitoring the incidental take of marine mammals. In the paper (see Appendix B, Swartz and Hofman 1991), the Commission reviewed the intent and relevant provisions of section 101(a)(5) of the Marine Mammal Protection Act, pointed out how marine mammals might be "taken" in the course of activities associated with offshore oil and gas exploration and development, and described the types of site-specific and long-term population monitoring programs that likely would be required to verify that such taking had negligible effects. The paper pointed out that responsibility for required monitoring programs should be shared by the responsible agencies, such as the Minerals Management Service and the National Marine Fisheries Service, and by special-interest groups that are the beneficiaries of the taking activities. It also pointed out that monitoring programs, like basic research programs, should be subject to peer review

at both the planning and the data analysis and reporting stages.

Points raised in the paper were considered and used by the meeting participants to help evaluate the results of past monitoring programs and programs proposed to be carried out to satisfy the requirements of section 101(a)(5).

Requests for Letters of Authorization

In 1991 the Commission, in consultation with its Committee of Scientific Advisors, reviewed and provided comments and recommendations to the National Marine Fisheries Service on four requests for letters of authorization to take bowhead, gray, and beluga whales and bearded, ringed, and spotted seals incidental to oil and gas exploratory drilling operations offshore Alaska. These are discussed in the previous annual report.

By *Federal Register* notice of 14 May 1992, the National Marine Fisheries Service announced that it had received a request from ARCO Alaska, Inc., for a letter of authorization to take marine mammals, specifically bowhead whales, by harassment incidental to its offshore exploration activities in the Beaufort Sea during 1992. In conjunction with its request, ARCO submitted a proposed bowhead whale monitoring plan for its Kuvlum #1 exploratory well project. In the same issue of the *Federal Register*, the Service noted that it had received a petition from a consortium of four oil companies seeking renewal of regulations to allow a take of ringed seals incidental to on-ice seismic activities in the Beaufort Sea.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed documents related to both issues and by letter of 8 July 1992 provided comments to the Service. In its letter the Commission noted that the proposed monitoring plan for the Kuvlum project likely would provide good estimates of the numbers of bowhead whales potentially affected by the exploratory drilling. However, it would provide no information on the species and number of marine mammals potentially affected after the fall bowhead whale migration moves past the drilling site and the proposed aerial surveys are terminated. The Commission further noted that there appeared to be no provision for monitoring any species other than bowhead whales, and it therefore was unlikely that the proposed program would provide more than incidental information on the potential effects of drilling and related support activities on species other than the bowhead whale. The Commission suggested that the Service determine whether one or more of the other species might also be affected by the planned operations, and if this possibility was not remote, require that the monitoring plan be revised accordingly before issuing the letter of authorization.

As regards the request to renew regulations authorizing taking of ringed seals, the Commission noted that the petition provided a reasonable basis for concluding that only small numbers of ringed seals were likely to be affected by the planned seismic activities and that the effects likely would be negligible. The Commission also noted that, while this or any single drilling or support activity was unlikely by itself to have significant adverse effects, the additive effects could be significant. The Commission pointed out that population monitoring as well as site-specific monitoring may be necessary to detect possible cumulative effects. The Commission recommended that, if the National Marine Fisheries Service had not already done so, it should consult with the Minerals Management Service, the Fish and Wildlife Service, the Alaska Department of Fish and Game, and relevant industry and Native groups to agree upon and as possible arrange for cooperative funding of a program to monitor the status of the ringed seal population(s) in Alaska waters.

On 15 September 1992 the National Marine Fisheries Service published in the *Federal Register* a proposed rule to govern the taking of ringed seals incidental to oil and gas exploratory activities (specifically seismic operations on the ice) in the Beaufort Sea from 1993 through 1997. By letter of 15 October 1992 the Commission provided comments on the Service's proposed rule. The Commission noted that the 15 September notice did not acknowledge or address the Commission's 8 July 1992 comments. The Commission therefore again recommended that the National Marine Fisheries Service consult with pertinent agencies and groups to agree on a cooperative program to monitor the status of ringed seal populations in Alaska. The Commission further

recommended that if the National Marine Fisheries Service had not already done so, it should (1) assess whether the activity-specific monitoring program required by the proposed rule is likely to provide an accurate estimate of the number of ringed seals affected by the authorized activities and the nature and significance of the effects, and (2) identify and take into account activities, in addition to Native subsistence hunting and the planned seismic surveys and related support activities, that may affect ringed seals and their habitat in areas offshore Alaska.

On 30 December 1992 the Fish and Wildlife Service published in the *Federal Register* a proposed rule to authorize, for a period of five years, the incidental, unintentional take of small numbers of polar bears and walruses during oil and gas operations in the Beaufort Sea. In its notice, the Service asked for comments on the proposed action and announced a series of public meetings to be held on the proposal rule at four locations in Alaska. Early in 1993 the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, will review the Service's proposed action and provide comments to the Service as appropriate.

The Minerals Management Service's Environmental Studies Program

As noted above, the Minerals Management Service is responsible for assessing and avoiding or mitigating the possible adverse environmental effects of offshore oil and gas exploration and development. To help meet this responsibility, the Service has established an Environmental Studies Program administered regionally by its Outer Continental Shelf offices in New Orleans, Louisiana; Camarillo, California; Anchorage, Alaska; and Herndon, Virginia.

To help the Service meet its responsibilities with regard to the conservation and protection of marine mammals, the Commission, in consultation with its Committee of Scientific Advisors, (1) reviews and provides comments on regional studies plans, environmental impact statements, and requests for proposals related to marine mammal research developed by the Service; (2) participates as requested in meetings of Technical Proposal Evaluation Committees convened by the Service to review research proposals; and (3) helps plan and participates in meetings and workshops to review and coordinate relevant research programs being conducted or planned by the Minerals Management Service, the National Marine Fisheries Service, the Fish and Wildlife Service, and other Federal, state, and private agencies and organizations.

Workshop on Tagging and Tracking Technology

Radio, sonic, and satellite-linked tags have been used with varying degrees of success to study marine mammals since the 1960s. One of the major difficulties, particularly as regards tagging large whales, has been in designing reliable attachment systems that do not harm the animals being tagged. As has been described in previous annual reports, in 1987 the Marine Mammal Commission, with funding from the Minerals Management Service, organized and convened a workshop to assess possible systems for tracking large whales (see Appendix B, Montgomery 1987). Because of the rapid changes in tagging technology, the National Marine Fisheries Service, the Minerals Management Service, and the Office of Naval Research sponsored a follow-up workshop in 1992 to assess the present state of tagging and tracking technology. At the request of the sponsoring agencies, the Marine Mammal Commission assisted in planning the workshop.

The Workshop on Tagging and Tracking Technology was held 11-13 February 1992 in Warrenton, Virginia. Participants included researchers from the United States, Great Britain, Canada, Norway, and Japan. Also participating were representatives of engineering and consulting firms involved in developing radio tags, as well as representatives of the sponsoring organizations, the Fish and Wildlife Service, and the British Sea Mammal Research Unit.

The objectives of the workshop were to (1) determine the state of the art with respect to instrumentation and sensors, attachment techniques, and data acquisition; (2) identify the problems and deficiencies in existing technology; (3) identify what must be done to overcome the problems; and (4) describe user

interests, needs, and requirements. The workshop identified a number of steps that could be taken to advance the state of tagging and tracking technology. The workshop report, to be completed early in 1993, is expected to recommend that the potential government user agencies form a consortium to fund and facilitate systematic research to develop safe and effective tracking technology.

Chapter X

RESEARCH AND STUDIES PROGRAM

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

Survey of Federally-Funded Marine Mammal Research

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

In 1992 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; the Department of the Navy; the Department of Energy; the Department of State; the Environmental Protection Agency; the National Aeronautics and Space Administration; the National Institutes of Health; the National Science Foundation; the Smithsonian Institution; the Coast Guard; the Department of the Interior's Fish and Wildlife Service, Minerals Management Service, and National Park Service; and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service, Office of Ocean and Coastal Resources Management, Coastal Monitoring and Bioeffects Assessment Division, National Ocean Pollution Program Office, and National Sea Grant College Program.

By December 1992 responses to requests for information concerning projects undertaken in FY 1992 and planned for FY 1993 had been received from most of the agencies. This information will be summarized early in 1993 and made available in the Commission-sponsored report "Survey of Federally-Funded Marine Mammal Research and Studies." (For earlier reports, see Appendix B, Waring 1981-1992.)

Research Program Reviews, Workshops, and Planning Meetings

In 1992 the Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, reviewed, commented on, and/or made recommendations on matters concerning bottlenose dolphins; harbor porpoises off Washington, Oregon, Alaska, and New England; harbor seals; Hawaiian monk seals; humpback whales; gray whales; killer whales; northern fur seals; polar bears; right whales; sea otters in

Alaska and California; Steller sea lions; West Indian manatees; the tuna-porpoise issue; high seas driftnet fisheries; other marine mammal-fisheries interactions; the disturbance of marine animals by military activities; the possible effects of high-energy, low-frequency sound on marine mammals; and entanglement of marine mammals in lost and discarded fishing gear and other marine debris.

The Commission, members of its Committee of Scientific Advisors, and its staff also convened, co-sponsored, provided background information for, and/or participated in meetings and workshops to:

- review elements of the National Marine Fisheries Service's Hawaiian monk seal research program;
- review U.S. domestic policy concerning the possible resumption of commercial whaling and the revision of the 1946 Convention for the Regulation of Whaling;
- develop contingency plans and review efforts to determine causes of unusual deaths of bottlenose dolphins along the Texas coast;
- develop research programs and review existing data on the effects of high-energy, low-frequency sound on marine mammals;
- review advancements in marine mammal tagging and tracking technology;
- determine site-specific monitoring programs necessary to ensure that offshore oil and gas activities have negligible effects on marine mammals;
- evaluate applications for permits to conduct research on humpback and killer whales;
- assess proposed research to identify alternative means for catching yellowfin tuna;
- review ongoing and planned research being coordinated by the Steller Sea Lion Recovery Team;
- review legislation, research, and management affecting Alaska marine mammals and indigenous peoples;
- develop conservation plans for polar bears, walruses, and Alaska sea otters;
- coordinate studies on humpback whales in Hawaii;
- enhance cooperative U.S.-Mexican efforts to protect the vaquita and reduce the take of dolphins in the yellowfin tuna purse seine fishery;
- assess priorities for implementing the newly adopted right whale recovery plan;
- identify and coordinate essential manatee research and management actions;
- coordinate and improve manatee rescue and rehabilitation activities;
- plan a conference to evaluate and update basic principles for the conservation of wild living resources;
- develop a marine debris action plan for the wider Caribbean region;
- plan the National Marine Fisheries Service's Fiscal Year 1993 marine entanglement research and management program; and
- prepare for the 1992 meetings of the International Whaling Commission and its Scientific Committee.

Commission-Sponsored Research and Study Projects

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

As noted earlier, the Commission convenes workshops and contracts for research and studies to help identify, define, and evaluate threats to marine mammals and their habitat. It also supports other research necessary to further the purposes and policies of the Act. Since it was established, the Commission has contracted for approximately 870 projects ranging in amounts from several hundred dollars to $150,000. The amount annually spent on research and studies since 1986 has averaged about $100,000.

From time to time, the Commission's investment in research activities is in the form of transfers of funds to and from other Federal agencies, particularly the National Marine Fisheries Service, the Fish and Wildlife Service, and the Minerals Management Service. When such funds are transferred from the Commission to another agency, the Commission provides detailed scopes of work that describe precisely what the agency is to do or to have done as well as

the requirements for reporting on progress to the Commission. In many instances, this has made it possible for agencies to start needed research sooner than might otherwise have been possible and to subsequently support the projects on their own for as long as necessary. The Commission believes that it is valuable to maintain agency involvement to the greatest extent possible and that such transfers provide a useful means of doing so.

In calendar year 1992 the Commission provided approximately $153,000 of its own funds to support research projects. Research undertaken in 1992 also includes specific projects co-sponsored by the National Marine Fisheries Service, the U.S. Navy, and the Department of State, for which these agencies transferred $142,000 to the Commission. The 1992 research projects, including those that were jointly supported, are summarized below.

Final reports from Commission-sponsored studies completed in 1992 and earlier are available from the National Technical Information Service; they are listed in Appendix B. Papers resulting entirely or in part from Commission-sponsored activities and published elsewhere are listed in Appendix C.

BASIC PRINCIPLES AND AGREEMENTS

New Principles for the Conservation of Wild Living Resources

(Lee Talbot, Ph.D., Lee Talbot Associates International, McLean, Virginia)

The Council on Environmental Quality, the World Wildlife Fund-U.S., the Ecological Society of America, the Smithsonian Institution, and the International Union for the Conservation of Nature and Natural Resources (now known as IUCN-The World Conservation Union) cooperatively sponsored a series of workshops in 1974 and 1975 to review basic principles for conserving wild living resources. The workshops concluded that traditional single-species, maximum sustainable yield management principles were outdated and recommended adoption of new principles for the conservation of wild living resources. These "new principles" have not been fully integrated into either domestic or international fisheries and wildlife conservation programs. Further, there have been significant changes in such things as fishing gear and practices, as well as advances in data acquisition and analytical capabilities (*e.g.*, improvements in computer and satellite technology) since 1975. The purpose of this project is to review, update, and determine how to improve implementation of basic principles for the conservation of wild living resources. The contractor is consulting with experts throughout the world and will chair a conference in May 1993 to identify and determine how best to address the various conceptual, practical, and technological problems. In the fall of 1993 the results of these consultations will be published and made available to individuals and organizations responsible for marine mammal, fisheries, and wildlife conservation throughout the world.

Compendium of International Treaties and Agreements Bearing upon the Conservation and Protection of Marine Mammals and Other Marine Living Resources

(Marine Mammal Commission Staff)

As noted in Chapter V, many treaties and other international agreements affect the conservation of marine mammals, other forms of life, and various habitats. To make these documents easily accessible to Congressional staff and others, in 1977 the Congressional Research Service, at the request of the Senate Committee on Commerce, Science, and Transportation compiled and published "Treaties and Other International Agreements on Fisheries, Oceanographic Resources, and Wildlife Involving the United States." Since then, many of the agreements have been amended and entirely new ones written. The purpose of this project is to update the 1977 compendium by incorporating the full texts of more than 375 treaties, international agreements, and other relevant documents concerning the environment, with an emphasis on marine matters. The compendium, which will be about 3,000 pages, should prove an essential reference document for both professionals and students in the fields of international law, environmental policy, and resource conservation.

RECOVERY AND CONSERVATION PLANS

Section 115(b) of the Marine Mammal Protection Act requires development of conservation plans for depleted species and populations and encourages development of conservation plans when such plans would facilitate maintenance of marine mammal populations within their optimum sustainable population ranges. The Endangered Species Act requires development of recovery plans for endangered and threatened species and populations, except when such plans would not materially contribute to rebuilding the species or population. As noted in Chapters III and VIII, the Commission has assisted the Fish and Wildlife Service in developing conservation plans for walruses, polar bears, and sea otters in Alaska. The Commission also has taken steps to identify actions necessary to protect and encourage recovery of endangered and threatened species throughout the world. Contract studies initiated in 1993 in support of these activities are described below.

Implementation of the Walrus Conservation Plan
(Kawerak, Inc., Nome, Alaska)

As noted in Chapters III and VIII and above, the Commission supported the preparation of a draft walrus conservation plan and transmitted the resulting product to the Fish and Wildlife Service in December 1991. Completion of the plan will require further consultation with other Federal agencies, state agencies, Native groups, and industries with interests and responsibilities for walrus conservation. Effective implementation of the plan may require development of cooperative agreements with a variety of organizations, including the Eskimo Walrus Commission and the Alaska Department of Fish and Game. To assist, the contractor is to provide a draft plan for completing and implementing the conservation plan and an outline of the possible terms of a cooperative agreement among the Eskimo Walrus Commission, the Fish and Wildlife Service, and the Alaska Department of Fish and Game for implementing the plan. These documents are to be completed and provided to the Fish and Wildlife Service early in 1993.

Development of a Recovery Plan for the Vaquita
(Bernardo Villa-Ramirez, Ph.D., Naturalia, Coyoacan, Mexico)

The vaquita, or Gulf of California harbor porpoise, occurs only in the northern Gulf of California (Sea of Cortez) where it is in danger of extinction (see Chapter III). The Government of Mexico is aware of the problem, and with assistance from several international organizations, has initiated efforts to protect the species and its habitat. To assist in this regard, the Commission helped to support the work of the chairman of the President of Mexico's Technical Committee for the Preservation of the Totoaba and the Vaquita in drafting a recovery plan identifying priority research and management tasks. The draft plan will be used to help focus and coordinate conservation efforts.

Implementation of IUCN-The World Conservation Union's Action Plan for the Conservation of Dolphins, Porpoises, and Whales
(Center for Marine Conservation, Washington, D.C.)

Many of the world's whale, dolphin, and porpoise populations are in danger of extinction as a result of human activities. In 1988 the Cetacean Specialist Group of IUCN's Species Survival Commission published a five-year plan for assessing and conserving these particular species and populations. The plan identifies more than 50 needed research and management actions. The purpose of this contract is to help support the costs of implementing the plan.

Preparation of a Pinniped Action Plan
(Peter J. H. Reijnders, Ph.D., Research Institute for Nature Management, Ben Burg, The Netherlands)

A number of pinniped species and populations are endangered, threatened, or at risk as a result of human activities. IUCN-The World Conservation Union has constituted a Seal Specialist Group to prepare a pinniped action plan, similar to the cetacean action plan mentioned in the previous project summary. The purpose of this contract is to provide funds

necessary to complete and publish the action plan. The plan is expected to be completed and distributed by June 1993.

Conservation of Steller Sea Lions, Harbor Seals, and Killer Whales in Alaska
(Point Stevens Press, Auke Bay, Alaska)

In 1988 the Marine Mammal Commission published a report entitled "Selected Marine Mammals of Alaska: Species Accounts with Research and Management Recommendations" (see Appendix B, Lentfer 1988). The purpose of this report was to synthesize background material for developing conservation plans for ten species of Alaska marine mammals. In 1991 the Marine Mammal Commission contracted for updates of the Steller sea lion and harbor seal species accounts. It also contracted for preparation of a report, with research and management recommendations, on killer whales in Alaska. The contract will provide funds to cover final editing, preparation of graphics, and publication of the three reports. The harbor seal and killer whale reports are expected to be published early in 1993. The Steller sea lion report is expected to be published by early summer.

LEGAL ASSESSMENT

Analysis of U.S. Authority for Implementing the 1973 Agreement on the Conservation of Polar Bears
(Donald C. Baur, Esquire, Perkins Coie, Washington, D.C.)

When the 1973 Agreement on the Conservation of Polar Bears was ratified by the United States in 1976, it was believed that the Marine Mammal Protection Act would provide adequate authority for the United States to implement all provisions of the Agreement. Recently questions have been raised as to whether the Act provides adequate authority to implement the provisions of the Agreement requiring protection of denning areas and other areas of similar importance to polar bears as well as the provisions prohibiting hunting from aircraft and large motorized vehicles. This contractor is doing a legal analysis to answer these questions. If the analysis indicates that additional implementing legislation or other measures are necessary for the United States to fully comply with the Agreement, the Commission will so advise the Department of State and the Fish and Wildlife Service.

RESEARCH PLANNING AND COORDINATION

Hawaii Humpback Whale Research Coordination Meeting
(University of Hawaii Sea Grant College Program, Honolulu, Hawaii)

At least ten individuals or organizations are authorized to conduct studies of humpback whales in the coastal waters of Hawaii. To ensure that the studies are coordinated and carried out with minimum disturbance of the whales and to prevent interference and unnecessary duplication, the Commission and the National Marine Fisheries Service provided funds for the researchers to meet in advance of the 1992 research season. The researchers discussed and, under the direction of the National Marine Fisheries Service, agreed on steps to minimize disturbance of whales, avoid interference with each other's research, and exchange data and future research plans.

Symposium on the Biology of the White Shark
(David G. Ainley, Ph.D., Point Reyes Bird Observatory, Stinson Beach, California)

The great white shark (*Carcharodon carcharias*) is known to prey upon elephant seals, sea lions, and harbor seals that pup and breed on the Farallon Islands and elsewhere in California. The significance of this predation is not well understood. In addition, the white shark population is being severely overfished and it is not known how depletion of this top-level predator may affect important predator-prey relationships and the health of the marine ecosystem. The contractor is organizing a symposium to review available information and identify actions possibly needed to protect white sharks and other components of the ecosystems of which they are a part. The symposium is scheduled to be held in March 1993. The Commission will review the symposium proceed-

ings, and as appropriate advise the National Marine Fisheries Service of needed follow-up actions.

Publication of *Sirenews*
(Daryl P. Domning, Ph.D.,* Sirenews, *Silver Spring, Maryland)

The IUCN-The World Conservation Union's Species Survival Commission has constituted a group of specialists, similar to the cetacean and pinniped specialist groups referred to earlier, to provide advice on actions needed to protect and conserve sirenians (manatees and dugongs) throughout the world. To facilitate communication among members of the group and others involved in conserving and protecting manatees and dugongs, the working group publishes a newsletter entitled *Sirenews*. The contractor is the editor of the newsletter. The Commission provided funds in 1989, 1990, and again in 1992 to help cover printing and mailing costs.

FIELD STUDIES

Manatee Surveys in the Miskito Coast Biological Reserve, Nicaragua
(Caribbean Conservation Corporation, Gainesville, Florida)

Historically, manatees occurred in coastal areas throughout most of the Gulf of Mexico and the wider Caribbean area. The species has been extirpated in many areas by commercial and subsistence hunting and by development-related habitat destruction. In October 1991 the Government of Nicaragua established the Miskito Coast Biological Reserve. The Reserve covers more than 8,200 square kilometers and includes seagrass beds and estuarine areas that are habitat for manatees and other species requiring special protection. During preliminary surveys in March 1992, the contractor counted more than 40 manatees in two large lagoon systems within the Reserve. The purpose of this contract was to help support a more comprehensive follow-up survey and to interview coastal residents to obtain information on local manatee distribution, abundance, and hunting. The follow-up surveys and interviews were conducted in May and June 1992. A total of 71 manatees were sighted during approximately 17 hours of surveys. In addition, 122 dolphins were sighted, including tucuxi, or gray river dolphins (*Sotalia fluviatilis*), which previously were not reported to occur north of Panama. The final contract report is expected to be completed and published in the spring of 1993.

Assessment of the Paucity of Right Whales and Other Cetaceans off the New England Coast in the Spring of 1992
(Robert D. Kenney, Ph.D., Graduate School of Oceanography, University of Rhode Island, Narrangansett, and Aero Marine Surveys, New London, Connecticut)

Available data indicate that the Great South Channel, east of Cape Cod, Massachusetts, is the primary spring feeding grounds for the western North Atlantic population of right whales, the world's most endangered large whale. Surveys carried out in spring 1992 failed to find the expected numbers of right whales or other cetaceans, suggesting that there had been a catastrophic population decline or more likely that the whales were elsewhere. The purpose of this study was to conduct aerial surveys of other areas to determine if the whales were present in areas not usually occupied in the spring. During these extended surveys, only a few right whales were found in the central Gulf of Maine, and none were seen in the Bay of Fundy or Brown's Bank. However, later in the year, normal numbers of whales were found in the Bay of Fundy and Brown's Bank — the population's regular summer feeding grounds — suggesting that the paucity of whales in the Great South Channel in the spring was not indicative of a general population decline.

Airship Surveys of Right Whales off Florida and Georgia
(James H.W. Hain, Ph.D., Associated Scientists at Woods Hole, Woods Hole, Massachusetts)

The contractor has pioneered the use of lighter-than-air aircraft to survey and observe marine mammals. In 1991, the Navy, the Minerals Management Service, and the Commission provided cooperative support for airship surveys to observe and evaluate interactions between right whales and ship traffic along the coast of Georgia and northern Florida,

where endangered right whales calve and nurse their young during the winter months. The survey results were promising, and in 1992 the Navy transferred funds to the Commission to continue the program. The survey and related observation data are expected to indicate how ship and boat traffic in the coastal waters of northern Florida and southern Georgia may be affecting right whales and what might usefully be done to avoid or minimize possible adverse effects. Its results also will be used in a public education and awareness program which the Navy has instituted in cooperation with the local community.

Health of Bottlenose Dolphins in Texas Coastal Waters

(Bernd G. Würsig, Ph.D., Texas A & M University, Galveston, Texas)

In the winter and spring of 1992, unusually high numbers of bottlenose dolphins died in coastal waters and washed up on beaches in Texas. The National Marine Fisheries Service initiated an investigation, and as part of the study they contracted with the investigator to capture and assess the general health of a number of live animals in the area where the unusual mortalities had occurred. The Commission provided supplemental funding to radiotag and track a subset of the live dolphins that were captured and released. The tracking data are expected to indicate habitat-use patterns of the dolphins and where they might come into contact with potentially hazardous environmental contaminants.

GENERAL

Maintenance of the Smithsonian Institution's Remington Kellogg Library

(Irina A. Koretsky, Falls Church, Virginia)

The Remington Kellogg Library at the Smithsonian Institution's National Museum of Natural History is one of the nation's largest repositories of marine mammal literature. The library holds many unique, difficult-to-find documents and is used by both professional researchers and students. The library does not have a full-time librarian to catalog documents. As a temporary measure, the Commission provided funds to the contractor to integrate the backlog of reprints into the library, to assemble related reprints for binding, and to upgrade and integrate the library's holdings of literature from the Soviet Union.

Illustration of a Field Guide to Marine Mammal Strandings

(Valerie Lounsbury, Literature Research & Illustration, Salford, Ontario, Canada)

Both live and dead stranded marine mammals can provide a valuable source of information on the natural history, status, and health of marine mammals. Recognizing that most strandings are investigated by volunteers with little or no formal training, the National Marine Fisheries Service contracted with a marine mammal expert to prepare a field guide on marine mammal strandings. The Commission provided funds to illustrate the field guide. It is expected to be completed and made available to Regional Marine Mammal Stranding Networks early in 1993.

Development of a Traveling Museum Exhibit on Ocean Conservation

(Judith A. Gradwohl, Smithsonian Institution, Office of Sponsored Projects, Washington, D.C.)

The Smithsonian Institution's Office of Environmental Awareness and the National Museum of Natural History are developing a traveling exhibition called "Ocean Planet." The 5,000-square-foot exhibit will visit eight American cities to introduce millions of museum, aquarium, and science center visitors to environmental issues affecting oceans and the science underlying ocean conservation. Using descriptive panels, dioramas, videos, printed material, interactive computerized information stations, and theater, the exhibit will describe, among other things, the fields of marine anthropology, marine biology, fisheries biology, oceanography, and biogeochemistry. The Marine Mammal Commission provided a small amount of funds to assist in the early planning stages.

Survey of Federally-Funded Marine Mammal Research

(George H. Waring, Ph.D., Southern Illinois University, Carbondale, Illinois)

As noted above, the Commission is required to carry out a continuing review of marine mammal research conducted or supported by other Federal agencies. Information concerning marine mammal research conducted by other agencies in Fiscal Year 1992 and planned to be conducted in Fiscal Year 1993 was requested from agencies in November 1992. The information is being provided and will be forwarded early in 1993 to the contractor, who will provide a draft report by 1 May 1993 summarizing the information obtained. The draft will be sent to the responding agencies to verify the accuracy of the data they provided. The final report, expected to be completed by mid-1993, will be reviewed by the Commission, in consultation with its Committee of Scientific Advisors, to help identify actions that may be necessary to better develop, focus, and coordinate Federal marine mammal research programs. The report will be provided to the responding agencies and will be available to interested individuals and organizations through the National Technical Information Service.

Chapter XI

PERMITS FOR MARINE MAMMAL RESEARCH, PUBLIC DISPLAY, AND ENHANCEMENT

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

Permit Application Review

Whether for a scientific research, public display, or species enhancement permit, the application review process involves the same four stages: (1) receipt and initial review of the application by either the Department of Commerce or the Department of the Interior; (2) publication in the *Federal Register* of a notice of the application, inviting public review and comment, and transmittal to the Marine Mammal Commission; (3) review of the application by the Commission, in consultation with its Committee of Scientific Advisors, and transmittal of its recommendation to the Department; and (4) final Departmental action on the application, including consideration of comments and recommendations of the Commission, the Animal and Plant Health Inspection Service on the adequacy of facilities and transportation, and the public. Figure 2 on the following page illustrates this process.

Once a permit has been issued, it can be modified by the responsible agency, provided the proposed modification meets the statutory requirements. A modification, in most cases, is subject to the same notice, review, and comment procedures as a permit application.

The total review time for a permit (from initial receipt of an application at the Service until final Departmental action) depends on many factors, including the sufficiency of the information provided by the applicant, any special requirements that must be satisfied before the application can be processed, and the efficiency and thoroughness of those responsible for the agency review.

During 1992 the Commission, in consultation with its Committee of Scientific Advisors, made recommendations on 40 permit applications submitted to the Department of Commerce and 11 applications submitted to the Department of the Interior. Of these, 11 applications awaited final action by the Department of Commerce and 8 applications awaited final action by the Department of the Interior at the end of 1992. The Commission's average review time for the 51 complete applications upon which it made recommendations in 1992 was 33 days. The Commission also made recommendations on 39 requests to modify permits and one request for a permit renewal during 1992. The average time required for Commission review of these requests was 27 days.

The Department of Commerce took final action on 29 permit applications during 1992, including four applications that were received in 1991. The average processing time, from the date the application was received by the Department until final action was taken, was 180 days. The Department of the Interior took final action on three permit applications during 1992. If calculated from the date the Department considered the application to be complete, the average

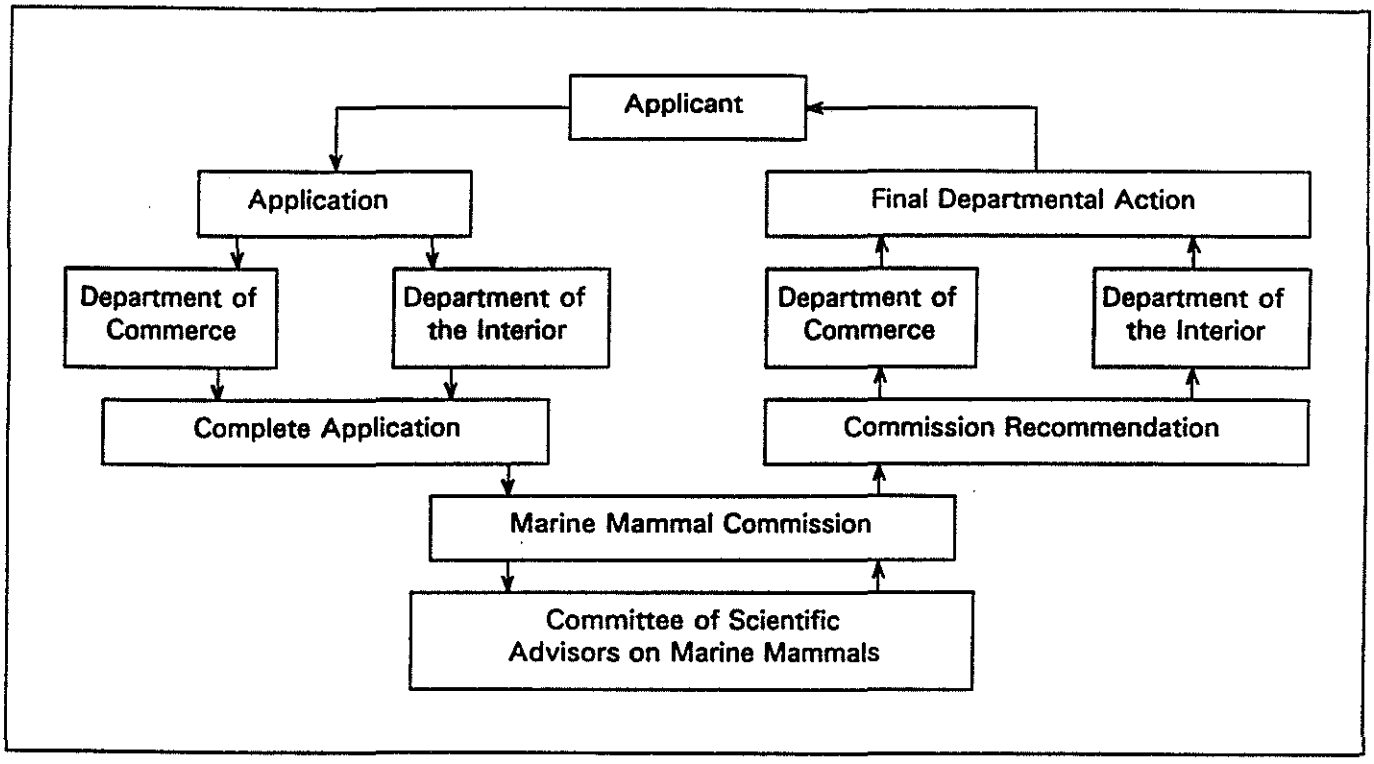

Figure 2. Process by which requests for permits to take marine mammals are reviewed.

processing times for the Departments of Commerce and the Interior were 125 and 151 days respectively, compared to 118 and 88 days in 1991.

Review of the Permit System

During the 1988 reauthorization of the Marine Mammal Protection Act, considerable attention was given to revising the Act's permit provisions. As an outgrowth of the interest in permit issues and because of the need to update its regulations and implement the 1988 amendments, the National Marine Fisheries Service undertook a comprehensive review of its permit program.

The first formal step in the Service's permit review was publication, in March 1989, of a discussion paper entitled "Permit Policies and Procedures for Scientific Research and Public Display under the Marine Mammal Protection Act and the Endangered Species Act." The discussion paper described the applicable law and Service policies with respect to public display, scientific research, and enhancement permits, and the relationship between permits and the National Environmental Policy Act.

As noted in its annual report for 1989, by letter of 24 August 1989 the Commission provided extensive comments on the discussion paper. Among other things, the Commission provided a possible definition of public display; recommended that the Department of Agriculture's Animal and Plant Health Inspection Service's marine mammal care and maintenance regulations be reviewed and as necessary revised; provided comments on the Service's interim policy on education and conservation programs required of public display permit holders; suggested basic infor-

mation requirements for scientific research permit applications and subsequent reports; proposed criteria for reviewing enhancement permits; recommended that the Service reexamine the legal status under the Marine Mammal Protection Act of the progeny from pre-Act marine mammals; recommended that the Federal agencies sharing responsibility for marine mammal management adopt more consistent administrative practices; and asked that the Service consider whether and when capture and temporary maintenance of marine mammals pending completion of a permanent facility might be appropriate.

In addition to soliciting written comments on its discussion paper, the Service convened a series of working sessions on various aspects of its permit program to secure additional public comment and discussion. The working sessions, held late in 1989 and early in 1990, focused on the following topics: (1) the definition of public display; (2) scientific research permits; (3) care and maintenance standards for captive marine mammals; (4) public display education and conservation programs; and (5) application of the National Environmental Policy Act.

Based on its discussion paper, comments received, and information generated at the working sessions, the Service is revising its permit regulations. The Service originally had hoped to have its draft proposed rule available for interagency review early in 1992, but because of an Administration moratorium on new regulations, was unable to do so. A draft proposed rule is now expected to be published in mid-1993.

Pending publication of its proposed revised regulations, the National Marine Fisheries Service has taken steps to institute some of the Commission recommendations noted above. As discussed in Chapter XI, the Service agreed to participate in an interagency review of the Animal and Plant Health Inspection Service's marine mammal care and maintenance standards. Also on 5 September 1991, the Service published a revised interpretation of its regulations clarifying that the Act's pre-Act exception applies only to marine mammals "taken" before the effective date of the Act. Under the revised interpretation "[a]ny person or facility that seeks to purchase, sell, or transport any marine mammal born in captivity after December 21, 1972, must obtain prior authorization...to do so." This interpretation is consistent with the long-held policy of the Fish and Wildlife Service for species under the Department of the Interior's jurisdiction.

As discussed in previous annual reports, in 1990 the Commission wrote to the Fish and Wildlife Service, recommending that it work with the National Marine Fisheries Service to ensure consistent interpretation and implementation of the 1988 amendments to the Marine Mammal Protection Act and other permit requirements. The Fish and Wildlife Service has informed the Commission that it intends to defer adoption of revised permit regulations until the National Marine Fisheries Service has completed its review and has published proposed regulations. At that time, the Fish and Wildlife Service expects to propose regulations that are either similar or identical to those of the National Marine Fisheries Service.

Implementation of 1988 Amendments to the Marine Mammal Protection Act

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

The amendments specify that public display permits may be issued only to an applicant that offers an acceptable education or conservation program, based upon professionally recognized standards of the public display community, and whose facility is open to the general public on a regularly scheduled basis. For scientific research permits, the amendment requires that applicants provide evidence that the proposed taking is necessary to further a *bona fide* scientific research need and does not unnecessarily duplicate other research. Lethal research on marine mammals can be authorized only if the applicant demonstrates that non-lethal alternatives are not feasible. In the

case of lethal research involving depleted marine mammals, a take may be authorized only if the Service first determines that the research will directly benefit the affected species or stock or will fulfill a critically important research need.

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

As discussed above, the National Marine Fisheries Service has undertaken a comprehensive review of its permit program. One issue being examined is how to implement the 1988 amendments. For example, the Service is examining what constitutes an acceptable education or conservation program at a public display facility; how to determine if proposed research is *bona fide* and non-duplicative; and how to implement the new enhancement authority. The Service expects to publish proposed rules to implement these provisions in mid-1993. The Fish and Wildlife Service continues to implement the 1988 amendments regarding permits on an *ad hoc* basis and intends to defer revision of its permit regulations until it has reviewed the proposed regulations being drafted by the National Marine Fisheries Service.

The first application for a permit under the new enhancement authority was received from the Jacksonville, Florida, field office of the Fish and Wildlife Service in 1992. The office requested an enhancement permit authorizing it to capture, treat, rehabilitate, and as feasible release distressed manatees in waters of the southeastern United States and Puerto Rico. By letter of 28 September 1992, the Commission noted that, while it would be desirable and appropriate to provide the Service's Field Office with authority to conduct, authorize, and coordinate manatee rescue and rehabilitation efforts, it was not clear that a permit was the most appropriate way to do this. The Commission explained that all of the requested activities could be accomplished without a permit under the authority of section 109(h)(1) of the Marine Mammal Protection Act. The Commission noted that authorizing rescue and rehabilitation activities under section 109(h)(1) would be administratively easier to accomplish, easier to modify should the need arise, and consistent with the pending legislation (which was subsequently enacted — see Chapter VI) to provide for a coordinated response to marine mammal strandings. At the end of 1992, the Fish and Wildlife Service had not completed processing the permit request.

Review of Humpback Whale and Killer Whale Scientific Research Permits

Applications for permits to take humpback whales and killer whales for purposes of scientific research in Hawaii and Alaska have increased in recent years. A total of 16 researchers are authorized to conduct studies on humpback or killer whales in Alaska and/or Hawaii. Combined, the researchers are authorized to "take" up to 6,680 humpback whales and 1,030 killer whales per year while conducting photo-identification, radio-tagging, acoustic, and genetic studies and aerial and vessel surveys.

The 1988 amendments to the Marine Mammal Protection Act require that applicants for scientific research permits provide evidence that the planned research is *bona fide* and not unnecessarily duplicative. The National Marine Fisheries Service, in consultation with the Marine Mammal Commission, must be able to conclude from the information provided by the applicants that the proposed studies constitute *bona fide* scientific research, are not unnecessarily duplicative, and will not, individually or collectively, disadvantage the affected species or stock. With respect to humpback whales listed as endangered under the Endangered Species Act, there also must be

a finding that the research will directly benefit the stock. Making these determinations can be difficult, particularly when more than one investigator is conducting similar studies on the same species in the same general area.

To increase and improve communication between the permit office and the researchers, and consequently to facilitate permit processing, three meetings were held by the National Marine Fisheries Service in 1992. Marine Mammal Commission staff members participated in each meeting. The first meeting, held on 18-20 August 1992 in Silver Spring, Maryland, was a working session consisting primarily of National Marine Fisheries Service staff. The participants planned subsequent meetings and reviewed the statutory requirements, regulations, policy, and legal issues for permits under the Marine Mammal Protection Act.

The second meeting, held on 28 September 1992 in Seattle, Washington, was an open meeting to which researchers holding humpback whale or killer whale research permits were invited. The goals were to inform researchers about the purpose of the review and give them a chance to ask questions about the review, statutory requirements for permits, and the permitting process.

The third meeting, held on 29-30 September 1992 in Seattle, Washington, was a meeting of an expert Scientific Review Panel, which reviewed the scientific merits of ongoing and proposed research on both species in the eastern North Pacific. The panel reviewed and commented on specific permits, and in many cases, recommended return of applications to researchers with requests for additional information in order to be better able to determine whether the research is *bona fide*, not unnecessarily duplicative, and humane.

Swim-with-the-Dolphin Programs

Since 1985, the National Marine Fisheries Service has authorized four public display facilities to conduct programs in which members of the public are allowed to enter the water and interact with captive bottlenose dolphins. Because of possible health and safety risks to both dolphin and human participants, these programs are considered experimental, and the National Marine Fisheries Service has authorized them only on a provisional basis.

On 25 August 1988, the Service initiated a review of swim-with-the-dolphin program operations and their effects. On 30 September 1988, the Service advised all public display permit holders that specific authorization was needed to conduct swim-with-the-dolphin-programs and that such authorizations would be issued only until the end of 1989, by which time the Service expected to have completed its review.

On 1 November 1989, in response to considerable public controversy generated by these programs, the Service issued a Draft Environmental Impact Statement concerning the effects of continued use of dolphins in swim programs. Commission comments on the draft statement recommended, among other things, that pending completion of the Service's review, no additional animals be removed from the wild for swim programs and no additional swim programs be authorized.

A Final Environmental Impact Statement was published in April 1990. Under the Service's preferred alternative, the four existing swim-with-the-dolphin programs would be continued on an experimental basis while a one-year study on the effects of the programs was conducted. The four permits were subsequently extended until 31 December 1991, and a workshop was convened to develop recommended protocols for a study or studies to determine the relative risks and benefits of swim-with-the-dolphin programs. The workshop recommended, among other things, that quarterly site visits be made to each swim program facility by a behavioral observation team and that these visits coincide with quarterly veterinary examinations of the dolphins involved in the swim program and control group animals. The workshop also recommended that the Service establish an advisory panel of veterinarians to review the results of veterinary examinations and to consult with the behavioral observation team on the analysis and interpretation of medical and behavioral data.

On 5 December 1991 the Service requested proposals from researchers interested in designing and

conducting the study of swim-with-the-dolphin programs. The contractor selected would be expected to collect data on the behavior and health of dolphins participating in swim programs and to assess the effects of the programs. To enable the existing programs to continue on an experimental basis during the study, on 31 December 1991 the Service extended the four existing permits until 30 June 1993.

When the request for proposals failed to identify a contractor able to design and conduct the study, on 18-19 May 1992 the Service convened a meeting to consider and design an interim study. Meeting participants, who included outside experts on dolphin behavior and training techniques as well as Service representatives, outlined a plan to carry out a study to assess certain behavioral and health characteristics of dolphins participating in swim-with-the-dolphin programs.

In June 1992 the National Marine Fisheries Service contracted for a comparative study of the four facilities authorized to operate experimental swim-with-the-dolphin programs. The study team includes a senior ethologist and two other persons to work as observers on the three-part study. The first stage, the training of observers and preparation for fieldwork, has been completed. The second stage, a pilot study, is underway and is expected to be completed in March 1993. The results of the pilot study will be analyzed and submitted in a report to the Service. Among other things, the report is to recommend any changes needed to improve the study techniques and design. Once the study protocol has been reviewed and any necessary modifications made, the third stage of the study will commence. This will involve observation of the four swim-with-the-dolphin programs over a nine-month period.

At the conclusion of this comparative swim-with-the-dolphin behavioral/assessment study, the National Marine Fisheries Service will examine all available swim-with-the-dolphin data and determine whether existing programs should be continued and whether the establishment of additional programs should be permitted.

As noted above, four swim-with-the-dolphin programs have been authorized by the National Marine Fisheries Service on an experimental basis. By *Federal Register* notice of 6 October 1988 the Service indicated that it would not authorize additional programs until the completion of its review of the experimental programs. Nevertheless, on 9 July 1992 Mirage Resorts submitted a request to the National Marine Fisheries Service seeking authority to conduct swim programs involving the six bottlenose dolphins it maintains in captivity. Consistent with its stated policy, the Service denied the request.

In response, on 1 September 1992 Mirage Resorts filed suit against the Secretary of Commerce in the United States District Court for the District of Nevada (*Mirage Resorts* v. *Franklin*) challenging the Service's decision not to authorize additional swim-with-the-dolphin programs. Mirage Resorts filed an amended complaint on 10 September 1992 alleging several violations of the Marine Mammal Protection Act and the Administrative Procedure Act. Mirage alleged that (1) no taking of a marine mammal occurs unless the animal is removed from the wild, thus no permit is required to conduct a swim program with dolphins already maintained in captivity; (2) the National Marine Fisheries Service is not empowered by the Marine Mammal Protection Act to regulate the care and maintenance of marine mammals held in captivity, including their use in swim programs; (3) the National Marine Fisheries Service may not prevent a permit holder from conducting a swim program because to do so would constitute an unauthorized regulation of the content of the facility's public display program; (4) the adoption of the Service's policy not to authorize additional swim programs pending review of the existing experimental programs is invalid because rulemaking procedures were not followed; and (5) by denying Mirage's request to conduct a swim-with-the-dolphin program, the National Marine Fisheries Service acted arbitrarily and capriciously because the Service has authorized comparable programs at other facilities and because there is no evidence that such programs pose a danger to dolphins.

Federal defendants filed an answer to the complaint on 2 November 1992 denying Mirage's allegations and raising several affirmative defenses. At the end of 1992 Mirage had indicated that it intended to amend its complaint to allege that the National Marine Fisheries Service lacks authority to regulate the care

and maintenance of captive-born dolphins. That is, Mirage intended to contend that the Service could not regulate or prohibit a swim program that uses only captive-born animals. At the end of 1992 no dispositive motions had been filed in the case.

On 9 November 1992 a participant in a swim-with-the-dolphin program was injured when he was rammed by a male dolphin, allegedly without provocation. The participant was treated for a fractured sternum.

After learning of the incident, on 17 December 1992 the National Marine Fisheries Service wrote to the facility, noting that the permit authorizing the swim-with-the-dolphin program requires that dolphins that injure humans be removed from the program immediately. Such animals may not be returned to the program until aggressive behaviors have been eliminated and it is determined that the dolphin poses no risk to human participants. The Service also noted that the facility had failed to notify the Service of the injury within twenty-four hours of the incident, as required by the permit.

By letter of 22 December 1992 the permit holder advised the Service that it had removed the animal from the program but that it believed this action was unnecessary. The permit holder contended that the permit authorized it to determine whether a dolphin was suitable to participate in the program, and in its view the aggressive behavior exhibited by the dolphin in question had been eliminated. Nevertheless, the facility operator agreed to a third-party examination of the animal's fitness for the program.

By letter of 30 December 1992 to the National Marine Fisheries Service, the Commission provided its views on the incident. The Commission pointed out the apparent inability of the swim-with-the-dolphin facility to comply with the permit requirements and the risk to participants who are exposed to potentially aggressive animals. The Commission suggested that the public safety would best be insured by a review of the suitability of an animal that has exhibited aggressive behavior and that such a review should be carried out by the Service in consultation with disinterested, third-party experts in dolphin behavior. The Commission further suggested that the Service undertake an immediate review of all swim-with-the-dolphin programs including (1) an analysis of the safety of the programs in light of reported and unreported accidents; and (2) a careful review of the provisions and wording of the existing permits to determine if modifications are needed. At the end of 1992 the Commission was reviewing the matter to determine whether it should formally recommend that the Service conduct such a review.

Feeding Wild Marine Mammals

In 1988 the Commission became aware that certain operators conducting commercial dolphin-watching trips in the Gulf of Mexico had begun feeding dolphins as part of their tours. The Commission referred the matter to the National Marine Fisheries Service, noting that feeding wild dolphins was contrary to the provisions of the Marine Mammal Protection Act and could adversely affect dolphins.

Recognizing that dolphin-feeding may constitute a "take" under the Marine Mammal Protection Act, on 25 January 1989 one operator requested a public display permit to approach, observe, and feed wild bottlenose dolphins in the Corpus Christi Ship Canal. After a thorough review of the issue, the Commission concluded that wild dolphin feeding programs, even those conducted with the utmost care and best of intentions, could adversely affect the dolphins. On 21 December 1989, the Commission wrote to the Service recommended that the permit be denied. Among the considerations that led to its conclusion were that feeding programs may (1) cause dolphins to be attracted to fishing boats and other vessels, increasing the likelihood that they will become entangled in fishing gear, be struck by vessels, or be shot, poisoned, or fed foreign objects; (2) cause animals to become dependent on such food sources and become less able to find and catch natural prey when feeding is discontinued; (3) alter migratory patterns, thereby subjecting animals to food shortages or inhospitable conditions that they otherwise would avoid; (4) condition animals to expect food from people, causing aggressive behavior when food is not offered; and (5) expose animals to and make them more susceptible to disease.

The Commission further recommended that the Service advise those conducting or contemplating programs in which wild marine mammals are fed that such programs constitute an unauthorized take under the Marine Mammal Protection Act. Tours that provide opportunities for observing dolphins, but which do not involve feeding, may, however, be conducted legally in ways that do not harass or otherwise take the animals. The Commission noted that guidance on such activities should be provided in whale-watching regulations currently being considered by the Service.

On 15 June 1990 the National Marine Fisheries Service denied the request for the dolphin feeding/ public display permit, citing its determination that these programs are not consistent with the purposes and policies of the Marine Mammal Protection Act. In addition, on 29 August 1990 the Service published a policy statement in the *Federal Register* advising that it would no longer accept or review public display permit applications seeking authorization to feed marine mammals in the wild.

In light of its published policy statement, on 20 September 1990 the Service, returned an application from another tour operator who was seeking authority to conduct a dolphin-feeding program under a joint public display/scientific research permit. The Service advised the applicant that the joint permit request could not be processed and suggested that a revised application for the scientific research aspects might be submitted. A scientific research permit application was subsequently filed with the Service on 22 October 1990, but was found to be deficient. The applicant was advised that it had not provided sufficient information to demonstrate that the proposed taking would be necessary to further a *bona fide* scientific purpose and would not unnecessarily duplicate other research.

To avoid any possible misunderstanding as to whether feeding wild marine mammals constitutes a take and is therefore a violation of the Marine Mammal Protection Act, the Service, by *Federal Register* notice of 29 August 1990, proposed to revise its regulatory definition of the term "take." The proposed revision would clarify that taking includes "feeding or attempting to feed a marine mammal in the wild in any manner."

By letter of 11 December 1990 the Commission supported adoption of the rule as proposed. The Commission's letter noted that feeding wild marine mammals could be harmful to the animals and that the proposed regulatory definition was consistent with the underlying statutory definition of the term "take."

The Service issued a final rule on 20 March 1991 amending the definition of the term "take" to include feeding or attempting to feed marine mammals in the wild. As promulgated, the rule applies to feeding all wild marine mammals under the jurisdiction of the National Marine Fisheries Service, not just dolphins. The rule also defined "feeding" to mean "offering, giving or attempting to give food or non-food items to marine mammals in the wild...including operating a vessel or providing other platforms from which feeding is conducted or supported." Feeding does not include the routine discard of bycatch during fishing operations or the otherwise legal, routine discharge of waste or fish by-products from fish processing plants. The Fish and Wildlife Service has not adopted comparable feeding regulations for species under its jurisdiction.

On 19 April 1991 the effective date of the new regulatory definitions, the tour operator who had requested authority to conduct a dolphin-feeding program under a scientific research permit filed suit in the U.S. District Court for the Southern District of Texas (*Strong* v. *United States*) seeking either to invalidate the new regulations or to compel issuance of a permit. Plaintiffs argued that broadening the regulatory definition of "take" to include feeding marine mammals was inconsistent with the statutory definition of the term, that the rule was arbitrary and capricious because there is no scientific evidence that feeding dolphins actually harms the animals, and that the Service abused its discretion by categorically refusing to consider public display requests for feeding operations.

The court issued a temporary restraining order on 19 April 1991. The action enjoined enforcement of the ban on feeding wild marine mammals, but only as it pertained to the plaintiffs. In issuing the order, the court expressed doubt that the Marine Mammal Protection Act's prohibition on taking can be read to ban dolphin feeding and noted that the plaintiff's

dolphin-feeding cruises are probably harmless to the dolphins, but are valuable to people. The temporary restraining order was extended pending a hearing on the merits of the case.

The Federal defendants filed a motion for summary judgment on 5 June 1991, arguing, among other things, that marine mammal feeding constitutes a form of harassment, is likely to alter marine mammal behavior, and poses significant risks to the animals. Plaintiffs filed a cross-motion for summary judgment on 18 June 1991. A hearing on the matter was held in Corpus Christi, Texas, on 19 December 1991.

The court issued its decision on 1 October 1992, ruling in favor of the plaintiffs and enjoining enforcement of the marine mammal feeding regulation as it pertains to dolphins. The court found that the regulatory definition of taking adopted by the Service was inconsistent with the statutory definition of that term. The court determined that "Congress intended a taking to be a reduction to possession or an annoyance sufficiently disturbing to cause flight from concern for self-preservation." In the court's view, "the term 'harass' would not in its ordinary sense include the mere feeding of animals in the wild." As such, the Service's regulation was determined to be at odds with the statutory definition of taking, or at least with the Congressional intent behind that definition.

The court further determined that the administrative record of the Service's rulemaking did not adequately support the conclusion that wild dolphins would be adversely affected if fed by humans. The court found that the record contained no scientific studies to justify the Service's conclusion. Rather, the Service "chose to support its regulation with theories of possible harm to dolphins based on evidence that is merely anecdotal."

The court ruled that even if it were valid to include feeding wild marine mammals in the regulatory definition of taking, the Service had acted arbitrarily in denying the plaintiff's public display permit application. The court found that the Service's policy against issuing public display permits for activities conducted in natural settings was in fact an agency rule, which had not been lawfully promulgated. The court also suggested that the policy, even if adopted through rulemaking, would be inconsistent with the Act's provisions. Inasmuch as Congress has recognized the value of marine mammal public displays, the court opined that the Service "has a duty to explore all reasonable avenues of display." Noting the rationale behind the public display permit provision, the court stated that "[t]he educational and recreational value of feeding operations in the dolphins' natural setting is at least presumptively as good as for [displays of captive dolphins in] marine parks...."

On 22 December 1992 the Federal defendants filed a notice of appeal. No further action was taken by the parties in 1992.

The feeding of wild dolphins also was addressed by Congress in the National Oceanic and Atmospheric Administration Authorization Act of 1992 (Pub. L. 102-567), which was enacted on 29 October 1992. Section 306 of that Act directs the Secretary of Commerce, in consultation with the National Academy of Sciences and the Marine Mammal Commission, to design and conduct a study in the eastern Gulf of Mexico on the effects of feeding wild dolphins. The study is to be designed to detect any behavioral or dietary modification resulting from feeding and to identify the effects of any such modifications on the health and well-being of the dolphins. The Secretary is required to submit a report on the results of the study to the House Committee on Merchant Marine and Fisheries and the Senate Committee on Commerce, Science, and Transportation by 29 April 1994.

Other Litigation

The Marine Mammal Protection Act allows both permit applicants and those opposed to issuance of a permit to seek judicial review of the terms and conditions of any permit issued under section 104 of the Act or of the denial of such a permit. In recent years, permit-related litigation has increased. In addition to *Mirage Resorts* v. *Franklin* and *Strong* v. *United States*, the swim-with-the-dolphin and the dolphin-feeding cases discussed above, the following cases were pending at the end of 1992:

Animal Protection Institute v. *Mosbacher* and *International Wildlife Coalition* v. *Franklin*

On 28 April 1989 the National Marine Fisheries Service issued a public display permit to the John G. Shedd Aquarium for importing up to six false killer whales (*Pseudorca crassidens*) already held captive in Japan. The Sierra Club Legal Defense Fund, on behalf of the Animal Protection Institute and other environmental and animal welfare groups, filed suit on 12 June 1989 challenging issuance of that permit. The plaintiff's suit challenged some of the Service's basic interpretations of the Marine Mammal Protection Act with respect to public display permits. The Shedd Aquarium and the American Association of Zoological Parks and Aquariums filed for and, on 11 September 1989, were granted intervenor status in the case.

In a motion for summary judgment filed on 17 January 1990, plaintiffs alleged that issuance of the permit violated section 101(a)(3)(A) of the Marine Mammal Protection Act because the Service had not certified that the program for taking marine mammals in Japan is consistent with the provisions and policies of the Marine Mammal Protection Act. Plaintiffs also contended that before a public display permit could properly be issued, the Service was required, through the formal rulemaking procedures of section 103, to determine that the affected population was within its optimum sustainable population level and to establish a quota for allowable takes. The plaintiffs asserted that the Service violated section 102(b) of the Act by failing to obtain sufficient information from the applicant to determine that the animals to be imported were not pregnant or nursing at the time of taking, were not less than eight months old, and were not taken in a manner deemed inhumane by the Secretary.

Federal defendants also filed a motion for summary judgment on 17 January 1990. In response to the plaintiff's claims, the defendants maintained that: section 101(a)(3)(A) applies only to waivers of the Act's moratorium on taking and importing marine mammals, and no certification of foreign consistency is required for public display permits; a formal determination of a stock's status relative to its optimum sustainable population is not a prerequisite for issuing a public display permit; the Service properly determined that permit issuance would not adversely affect the wild false killer whale population because the requested animals were already in captivity; and minimum size requirements and other conditions set forth in the permit assured that young, unweaned animals, pregnant or nursing females, and animals taken in an inhumane manner would not be imported.

Briefing of *Animal Protection Institute* v. *Mosbacher* was completed in February 1990, but a hearing on the matter was not scheduled until 1992. In the meantime, on 29 November 1991 the Service issued a permit to the Shedd Aquarium authorizing the importation of four beluga whales (*Delphinaptera leucas*) from Canada. Environmental and animal welfare groups, this time headed by the International Wildlife Coalition, filed suit in district court on 24 January 1992 challenging the issuance of that permit (*International Wildlife Coalition* v. *Franklin*). The grounds for the challenge were essentially identical to those in *Animal Protection Institute* v. *Mosbacher*. Because of the similarity of parties, facts, and issues, the cases were consolidated by the court on 29 April 1992. A hearing was held on 2 July 1992.

The U.S. District Court for the District of Columbia issued its ruling on 31 July 1992, upholding both permits. The court found that Congress, in granting a limited exception from the moratorium on taking and importing marine mammals for "beneficent purposes," such as scientific research, public display, or species enhancement under section 101(a)(1) of the Marine Mammal Protection Act, gave the Service authority "to grant a modest dispensation...without awaiting the outcome of more elaborate administrative proceedings...for more destructive assaults upon the population of a species." Thus, formal determinations that the affected stocks are at their optimum sustainable population levels and that the country of origin has a marine mammal program consistent with the Marine Mammal Protection Act were not necessary.

The court further ruled that the Service had acted rationally in issuing the two permits to the Shedd Aquarium. With respect to importing false killer whales from Japan, the court reasoned that inasmuch as the animals were already in captivity, their importation would have no direct effect on the wild population. The court also found that the administrative

record sufficiently demonstrated that the stock of false killer whales from which the animals were taken was neither threatened nor endangered under the Endangered Species Act or determined to be depleted under the Marine Mammal Protection Act. Regarding the importation of beluga whales from Canada, the court found that the Environmental Assessment prepared by the Service adequately supported the decision to issue the permit. As to the requirement that the animals to be imported not be pregnant, nursing, or less that eight months old at the time of taking, the court found that the permit provision prohibiting the importation of such animals was sufficient.

The decision was appealed by plaintiffs on 3 August 1992. At the end of 1992, no briefing schedule for the appeal had been set.

Kama v. *New England Aquarium*

Kama, a captive-born bottlenose dolphin formerly maintained at the New England Aquarium under a public display permit, was transferred to the U.S. Navy in 1987 under a letter of agreement issued by the National Marine Fisheries Service. The Navy, through a separate letter of agreement, was authorized to maintain the dolphin under the terms and conditions of the Navy's existing scientific research permit.

On 14 June 1991, Citizens to End Animal Suffering and Exploitation (CEASE) and other groups filed suit on behalf of Kama against the New England Aquarium, the Department of Commerce, and the Navy, seeking to compel return of the dolphin to the aquarium. Plaintiffs alleged that transfers of marine mammals between facilities could be authorized only by permit and that the Service's practice of authorizing such transfers under letters of agreement violated the Marine Mammal Protection Act. Similarly, allegations were made that the Service improperly authorized the taking of beached and stranded marine mammals under letters of agreement. In addition, plaintiffs asserted that the Service had violated the National Environmental Policy Act by failing to analyze the impacts of authorizing the taking, purchase, sale, and transport of marine mammals under letters of agreement.

Plaintiffs also claimed that the National Marine Fisheries Service violated the Act by modifying permits without prior public notice when the modification would neither increase the number of marine mammals authorized to be taken nor pose increased risks to the animals. Based on this premise, plaintiffs also are seeking to invalidate the Service's two-year extension of a public display permit issued to the New England Aquarium to collect bottlenose dolphins.

The New England Aquarium filed a counterclaim on 17 September 1991, claiming abuse of process and defamation by the plaintiffs. The aquarium has alleged that plaintiffs knew that their original claims were without merit and waited too long to bring their claims. It is seeking $3 million in damages for abuse of process. The aquarium also has charged that plaintiffs have made false and defamatory statements regarding the aquarium and is seeking an additional $2 million in damages.

Federal defendants filed a motion to dismiss the lawsuit, and in the alternative, a motion for summary judgment on 6 January 1992. In support of these motions the Federal government argued that inasmuch as the Marine Mammal Protection Act grants the Secretary of Commerce authority to oversee the supervision, care, and transport of captive marine mammals pursuant to and after taking or importation, and because the authority for continued oversight after a transfer extends from the original permit, there is no statutory requirement that a new permit be issued to authorize a transfer of a marine mammal from one permit holder to another. Rather, the Secretary may use the broad powers of section 112(c) to issue a letter of agreement to authorize such transfers.

Federal defendants also contended that section 109(h), which allows the Secretary's designees to respond to marine mammal strandings, and section 112(c), which allows the Secretary to enter into contracts or other agreements to further the purposes of the Act, provide the basis for authorizing the taking of stranded marine mammals under letters of agreement. As to the alleged violations of the National Environmental Policy Act, Federal defendants argued that the challenged transfer properly fell within a categorical exclusion, and therefore preparation of an Environmental Assessment or an Environmental

Impact Statement was not required. The Federal defendants also noted that, although the Act requires prior notice to the permittee of a proposed permit modification, there is no statutory requirement for prior public notice and comment.

The New England Aquarium, making similar arguments, filed similar dispositive motions on 9 January 1992. Briefing of the case has been completed, but as of the end of 1992, no hearing date had been set.

Chapter XII

MARINE MAMMALS IN CAPTIVITY

Under the Marine Mammal Protection Act, permits to take marine mammals for purposes of public display or scientific research or to enhance the survival or recovery of a species or stock may be issued by the Secretary of Commerce or the Secretary of the Interior, depending upon the species of marine mammal involved. The Act requires that such permits specify the methods of capture, supervision, care, and transportation to be followed pursuant to and after taking or importation, including requirements for maintaining the animals in captivity.

In addition, the Department of Agriculture's Animal and Plant Health Inspection Service regulates the handling, care, treatment, and transportation of captive marine mammals under the Animal Welfare Act. Since its inception, the Marine Mammal Commission has worked with the responsible agencies in an effort to ensure the safety and well-being of marine mammals maintained in captivity. Activities regarding the development and revision of applicable standards are discussed below.

The longstanding interpretation of applicable law that the Animal and Plant Health Inspection Service, the National Marine Fisheries Service, and the Fish and Wildlife Service share responsibility for regulating the care and maintenance of captive marine mammals has recently come under challenge. In *Mirage Resorts* v. *Franklin*, a lawsuit challenging the denial of a request for authority to conduct a swim-with-the-dolphin program, the plaintiffs alleged that the National Marine Fisheries Service is not empowered under the Marine Mammal Protection Act to regulate the care and maintenance of marine mammals held in captivity, including their use in swim programs. This case is discussed in Chapter XI.

Animal Welfare Act

In 1979 the National Marine Fisheries Service, the Fish and Wildlife Service, and the Animal and Plant Health Inspection Service entered into a cooperative agreement to promote the effective implementation of standards governing the humane handling, care, treatment, and transportation of captive marine mammals. The agreement seeks to (1) ensure uniform application of the standards; (2) provide appropriate and consistent guidance to persons responsible for captive marine mammals; and (3) ensure the effective utilization of the personnel and unique capabilities of each agency, with minimal duplication of effort.

Also in 1979, the Animal and Plant Health Inspection Service issued Standards and Regulations for the Humane Handling, Care, Treatment, and Transportation of Marine Mammals under the authority of the Animal Welfare Act. The standards establish minimum requirements for the care, maintenance, and transportation of captive marine mammals that apply to dealers, exhibitors, researchers, carriers, and intermediate handlers. All persons or facilities maintaining marine mammals in captivity in the United States for purposes of public display, scientific research, or species enhancement must obtain licenses from the Animal and Plant Health Inspection Service; they also must maintain those marine mammals in compliance with the standards.

The standards were last amended by the Service in 1984. Significant areas covered by the amendments included space requirements for primary enclosures for certain marine mammals, procedures for granting variances, construction requirements for marine mammal facilities, requirements for accompanying pinnipeds during transport, and specifications for holding areas for marine mammals temporarily maintained at airports or elsewhere during shipment.

Review and Revision of Marine Mammal Care and Maintenance Standards

On 29 May 1990 representatives of the Animal and Plant Health Inspection Service, the National Marine Fisheries Service, the Fish and Wildlife Service, and the Marine Mammal Commission met to discuss possible revisions of the Animal and Plant Health Inspection Service's standards governing the humane handling, care, treatment, and transportation of captive marine mammals. At the meeting, agency representatives agreed that a review of the standards was desirable. They adopted a general approach as follows: (1) development of a discussion paper by the Marine Mammal Commission to assist the Services in drafting revised regulations; (2) development of draft regulations by the Services and review by a working group consisting of representatives from the four Federal agencies and representatives of the research, public display, and environmental communities; and (3) publication of proposed regulations by the Services for a 60-day comment period.

On 31 July 1991 as agreed the Marine Mammal Commission, provided a comprehensive discussion paper setting forth questions and shortcomings to be addressed and submitted it to the Animal and Plant Health Inspection Service. In its letter transmitting the discussion paper, the Commission recommended that if the Animal and Plant Health Inspection Service could not undertake the review promptly, the National Marine Fisheries Service, which has responsibility for all cetaceans and all pinnipeds except the walrus under the Marine Mammal Protection Act, should be asked to assume primary responsibility.

On 11 September 1991 the Animal and Plant Health Inspection Service responded to the Commission's letter. The Service indicated that an internal review of the standards was underway and that the Commission's discussion paper would be used to guide development of revised standards. The Commission replied to the Service's letter on 20 December 1991, expressing concern that the Service might not recall the agreement among the Service, the National Marine Fisheries Service, the Fish and Wildlife Service, and the Commission that the review be conducted as an interagency effort. The Commission stressed the need for prompt action, commencing with a meeting of representatives of the three Services and the Commission to establish a timetable and plan for carrying out the review.

The Animal and Plant Health Inspection Service responded by letter of 7 April 1992, noting that the Government-wide moratorium on new regulations had caused the review to be delayed. The Service indicated that it still intended to proceed with the review and was committed to consulting with the appropriate parties in the regulation writing process. As of the end of 1992, the Commission was aware of no further action by the Service to review or revise the standards or to consult with the other involved agencies.

Maintenance of Marine Mammals in Isolation

One issue that the Commission has recommended be examined by the Animal and Plant Health Inspection Service in the course of reviewing the standards for captive marine mammals is the maintenance of marine mammals in isolation. The Commission has long believed that maintenance of captive marine mammals in isolation (*i.e.*, without the companionship of other animals of the same species or a compatible species of the same order) is inappropriate except for purposes of medical treatment or on a temporary basis in other special situations. As discussed in previous annual reports, the Commission has written to the Animal and Plant Health Inspection Service on several occasions since 1987 regarding this issue.

The Commission has repeatedly expressed concern about the Animal and Plant Health Inspection Service's interpretation of that section of the Animal Welfare Act standards that addresses separation of animals being held in captivity, particularly with respect to those species considered by the Service as suitable companion animals for marine mammals. The Commission, in reacting to the Service's having found a sea turtle to be a suitable companion for a bottlenose dolphin, recommended that the regulations not be interpreted so broadly as to undermine their effectiveness and enforcement. The Commission also

recommended that the Service undertake an investigation to identify facilities maintaining marine mammals in isolation so that corrective action could be taken. By letter of 9 March 1989, the Service indicated that as the Commission had recommended, it had conducted a field survey of the facilities, but had yet to compile and review the results.

The issue of captive isolation was most recently raised by the Commission in a 24 April 1992 letter concerning a bottlenose dolphin being maintained alone. In that letter, the Commission again recommended that the Service reconsider its interpretation of the regulatory provision concerning maintenance of marine mammals in isolation. The Commission also reiterated an earlier request that the Service advise it of whether the results of the 1989 field survey of facilities had been compiled and analyzed.

The Service replied by letter of 1 May 1992. Without further explanation, it stated its view that the Animal Welfare Act does not provide authority to require that at least two members of every social species of animal be maintained in captivity. The Service also provided its interpretation of the regulatory provision regarding isolation, which is that "marine mammals may be given access to other marine mammals of the same or different species, if they are compatible,...[t]hey may be given access to other types of aquatic animals, or they may be provided with additional attention by their trainer." With respect to the field surveys to identify facilities maintaining marine mammals in isolation, the Service indicated that "[d]ue to inadequate staffing levels, reorganization, increasing workloads, and other higher priority work assignments, the data were never reviewed." The Service further noted that it had lost or discarded the information and that no analysis would be available unless it repeated the field surveys.

Water Quality Seminar

In 1992 the Animal and Plant Health Inspection Service held the first training seminar of its kind on water quality as it relates to marine mammal life support systems. With continual reference to actual field conditions, participants critically reviewed methods for insuring water quality, the strengths and weaknesses of each, and made recommendations for improvements. The seminar, designed primarily as a training program for Service inspectors, was held at the Shedd Aquarium in Chicago.

The Lacey Act

As discussed above, the transport of marine mammals is regulated by the Animal and Plant Health Inspection Service under the Animal Welfare Act as well as by the National Marine Fisheries Service and the Fish and Wildlife Service under the Marine Mammal Protection Act. In addition, the Lacey Act Amendments of 1981 direct the Secretary of the Interior to prescribe requirements for the humane and healthful transport of wild animals and birds, including marine mammals, shipped to the United States. On 10 November 1987, the Fish and Wildlife Service published a final rule establishing transport standards for animals and birds. It was to take effect 90 days later.

Before the final rule became effective, however, a significant number of adverse comments were submitted to the Service. Commentors noted that compliance with the regulations could result in inhumane treatment of some animals. It also was argued that the regulations would, in some cases, be difficult to enforce, and without good reason would make it virtually impossible to transport some types of animals. On 8 February 1988, the date the regulations would have taken effect, the Service postponed the effective date until 1 August 1988 to provide time to thoroughly evaluate these assertions. On 1 March 1988, animal welfare groups brought suit against the Service, seeking to have the regulations take effect immediately. The District Court for the District of Columbia ruled on 18 April 1988 that the delay in implementing the transport regulations was without good cause and issued a preliminary injunction setting 8 February 1988 as the effective date of the rule.

Subsequently, the Service undertook a review of the regulations to identify those provisions that were in need of amendment or clarification. It published a notice of intent to amend the regulations and indicated

those provisions of the rule that appeared to warrant change. Based upon that review, the Service published a *Federal Register* notice on 15 October 1990, proposing amendments to the rules. With respect to the marine mammal section of the regulations, the proposed amendments were limited to editorial changes, including the elimination of duplicative provisions.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed and provided comments on the proposed regulations on 4 January 1991. The Commission supported adoption of the proposed rule with certain modifications, including a reduction in the length of time before departure that a marine mammal may be consigned to a carrier. The Commission strongly supported the requirement that marine mammals be accompanied in shipment by individuals knowledgeable in their care. It also noted that the effectiveness of this requirement would be enhanced if the carrier were required to inform the caretaker of any unexpected delays during transport, and except as precluded by safety considerations, accommodate requests by the caretaker for access to the animal. In addition, the Commission recommended that Fish and Wildlife Service representatives participating in efforts to develop international animal transport standards pursuant to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) seek agreement on terms consistent with those issued under the Animal Welfare Act and the Lacey Act Amendments of 1981.

The Service published its final rule in the *Federal Register* on 17 June 1992. All of the recommendations made by the Commission were adopted in the final rule. Under the new regulations, carriers may not accept a marine mammal for shipment more than six hours before the scheduled departure. The regulations also specify that the carrier must notify the crew as to the presence of any live animals in a shipment and require that in all instances, the animals and their humane care are to take precedence over the handling of inanimate cargo. The regulations also change the amount of ventilation area required for enclosures containing marine mammals from 16 percent to 20 percent of the enclosed area.

APPENDIX A

MARINE MAMMAL COMMISSION RECOMMENDATIONS IN 1992

13 January	Commerce, commenting to the National Marine Fisheries Service on a proposed rule to implement Amendment 17 to the Bering Sea Groundfish Fishery Management Plan and thereby close certain waters around walrus haulout sites in Bristol Bay for groundfish trawling; noting that the North Pacific Fishery Management Council withdrew its support for the proposed closure; and recommending, among other things, that, notwithstanding the Council's new position, the proposed closure be adopted and that the Service take steps to ensure that comparable regulatory measures be pursued for State waters within three miles of any adopted closure.
17 January	Commerce, scientific research permit, Janice M. Straley.
23 January	Commerce, scientific research permit, William A. Watkins.
27 January	Commerce, modification of scientific research permit, Dan R. Salden.
29 January	Interior, public display permit, Oregon Coast Aquarium.
29 January	Interior, public display permit, Seattle Aquarium.
29 January	Interior, modification of scientific research permit, Smithsonian Institution.
30 January	Commerce, scientific research permit, Southwest Research Associates.
5 February	Commerce, modification of scientific research permit, Southwest Fisheries Science Center.
6 February	Commerce, scientific research permit, Phillip J. Clapham and David K. Matilla.
7 February	Commerce, modification of scientific research permit, Alaska Fisheries Science Center.
11 February	Commerce, scientific research permit, Dena R. Matkin.
24 February	Commerce, two public display permits, Sea World, Inc.
25 February	Commerce, commenting to the National Marine Fisheries Service on necropsy reports for four bottlenose dolphins that had been involved in an experimental swim-with-the-dolphin program; noting that cultures were not taken from all animals to check for human strains of bacteria and viruses; and recommending that the Service consider examining serum from these dolphins, if available, for antibodies to delphinoid distemper virus, parvovirus, and hepatitis.
2 March	Commerce, commenting to the National Marine Fisheries Service on proposed changes to its list of fisheries *vis à vis* interactions with marine mammals; and recommending that the Service, among other things, (1) review its procedures for reviewing and updating this list to ensure compliance with regulatory requirements; (2) periodically update and publish marine mammal-fisheries interaction data collected under the interim exemption program; (3) assess the likelihood that available data accurately represent the average or long-term take level for individual fisheries; and (4) upgrade the South Atlantic and Gulf of Mexico shrimp trawl and menhaden purse seine fisheries to Category II on the list.

2 March	Commerce, two scientific research permits, Alaska Department of Fish and Game.
2 March	Interior, request for renewal of scientific research permit, Alaska Fish and Wildlife Research Center.
9 March	Commerce, modification of scientific research permit, LGL, Ltd., Environmental Research Associates.
9 March	Commerce, modification of scientific research permit, Southwest Fisheries Science Center.
12 March	Commerce, commenting to the National Marine Fisheries Service on the Coast Guard's closure and dismantling of the Loran station on Kure Atoll; noting that the original December 1992 closure date had been moved forward to 30 June 1992, in part to allow station dismantling and clean-up to proceed without interfering with the Hawaiian monk seal pupping season; further noting that disturbance of seals during the new closure period is still possible; and recommending the Service advise the Commission as to (1) the status of section 7 consultations with the Coast Guard on dismantling the station; (2) its recommendations to the Coast Guard on removing debris hazardous to monk seals and actions that will be taken on those recommendations; and (3) plans for putting a Service agent on the atoll to monitor dismantling activities and enforce protective measures.
13 March	Commerce, modification of scientific research permit, Alaska Department of Fish and Game.
13 March	Commerce, modification of two scientific research permits, Southwest Fisheries Science Center.
17 March	Commerce, modification of scientific research permit, Pacific Whale Foundation.
20 March	Commerce, modification of scientific research permit, Cetacean Research Unit.
20 March	Commerce, modification of scientific research permit, Center for Coastal Studies.
20 March	Commerce, modification of scientific research permit, Scott D. Kraus.
23 March	Interior, commenting to the Fish and Wildlife Service on an emergency rule to establish four manatee sanctuaries in Kings Bay Florida; noting that the size and location of existing sanctuary areas in Kings Bay are no longer adequate to protect manatees and that the emergency rule would protect manatees pending adoption of final rules to implement new seasonal sanctuaries on a permanent basis; expressing support for the emergency rule; and recommending that the Service (1) publish proposed permanent rules for sanctuaries as soon as possible; (2) review data on the timing of peak manatee abundance in Kings Bay; and (3) consult with the Florida Department of Natural Resources to ensure that seasonal dates for regulation within the Service's manatee sanctuaries are consistent with seasonal dates for the area's boat speed regulatory zones.
23 March	Interior, commenting to the Fish and Wildlife Service on its intent to prepare regulations establishing a manatee refuge in the Lake Woodruff National Wildlife Refuge in Volusia County, Florida; noting that the action would be needed only if boat speed rules recently adopted for Volusia County by the State are successfully challenged; recommending that, if it becomes necessary to develop Federal regulations, the Service consider designating the St. Johns River and associated waters as the manatee refuge; and further recommending that, if the State's boat speed regulations remain in effect, the Service and the Florida Department of Natural Resources develop agreements to authorize enforcement by Service, as well as State enforcement officers of relevant State rules.
24 March	Commerce, scientific research permit, Paul D. Jobsis.
25 March	Commerce, modification of scientific research permit, C. Scott Baker.

7 April	Commerce, scientific research permit, Marine Animal Resource Center.
9 April	Commerce, modification of scientific research permit, Thomas R. Kieckhefer.
10 April	Commerce, scientific research permit, Southwest Fisheries Science Center.
13 April	Commerce, modification of scientific research permit, James T. Harvey.
17 April	Commerce, commenting to the National Marine Fisheries Service on the Hawaiian Monk Seal Recovery Program; noting that the Service has taken appropriate initial steps to develop a pilot satellite-linked tagging program and to add a veterinarian to the Captive Monk Seal Review Committee; reiterating previous recommendations that (1) a representative of the staff of the Hawaiian Islands National Wildlife Refuge be added to the Hawaiian Monk Seal Recovery Team; and (2) if the Service convenes a second meeting of behavioral experts to review information on the mobbing problem, consideration be given to including specific individuals; and recommending that the Service (1) continue considering less expensive population monitoring techniques; (2) continue collecting population data at Laysan Island, Lisianski Island, and French Frigate Shoals; (3) increase observer coverage of the longline fishery; (4) assess monk seal/prey relationships using non-invasive methods; and (5) in the long-term Terni Island restoration schedule, address efforts to secure funds for contracting and construction after completion of the design phase; and requesting that the Service provide the Commission with results from related observer programs, Recovery Team meetings, and ongoing research.
17 April	Commerce, commenting to the National Marine Fisheries Service on a request for emergency authorization to take Atlantic bottlenose dolphins and other cetaceans along the coast of Texas for analyses of possible causes of an ongoing unusual mortality event; and recommending approval of the request.
20 April	Commerce, modification of scientific research permit, Alaska Fisheries Science Center.
21 April	Commerce, scientific research permit, Raymond Tarpley.
23 April	Commerce, two scientific research permits, National Marine Mammal Laboratory.
27 April	Interior, scientific research permit, Graham A.J. Worthy.
27 April	Commerce, modification of scientific research permit, Randall S. Wells.
5 May	Interior, providing to the Fish and Wildlife Service a draft Alaska Sea Otter Conservation Plan; recommending, among other things, that the draft plan be given to the Service's Alaska sea otter advisory group for review and comment, and that its comments be used in conjunction with the Commission's draft plan to prepare a final draft that will be circulated prior to adoption; also recommending that the Service evaluate actions taken to assess and mitigate the effects of the *Exxon Valdez* oil spill on sea otters and their habitat and, based on this evaluation, develop a draft contingency plan for future oil spills that (1) describes actions to minimize impacts of future oil spills on sea otters in Prince William Sound; and (2) lists personnel, equipment, facilities, and funding needed to respond to possible future oil spills; and further recommending that the Service (1) evaluate where human-otter conflicts are likely to occur; (2) consult with the Alaska Sea Otter Commission on steps to (a) ensure that Native hunters are aware of and comply with marking and tagging regulations; and (b) develop a cooperative biological sampling program; and (3) convene a workshop to determine the maximum net productivity of Alaska sea otter populations.
11 May	Interior, commenting to the Fish and Wildlife Service on the draft revision of the Southern Sea Otter

Recovery Plan; noting a number of uncertainties concerning the nature of proposed actions in the draft plan; restating an earlier recommendation that the Service prepare a second draft revision of the plan and circulate it to the Commission and others for review; and requesting that, if the Service does not intend to follow this recommendation, it immediately advise the Commission of the reason(s) why it has chosen not to do so.

12 May — Interior, commenting to the Minerals Management Service on the notice of intent to prepare an environmental impact statement on Lease Sale 153 in St. George Basin, Alaska; and recommending, among other things, that the statement identify and assess the possible cumulative effects of drilling, gas development, and other human activities that may affect marine mammals and their habitat; and that the National Marine Fisheries Service, the Alaska Department of Fish and Game, and the Fish and Wildlife Service be contacted to (1) obtain the best available information on the different marine mammal food species, feeding areas, and breeding grounds; (2) identify additional research and monitoring programs needed to assess and detect effects of oil exploration in St. George Basin on these species; and (3) develop a "notice to lessees" describing what must be done to comply with the provision of the Marine Mammal Protection Act pertaining to the incidental take of marine mammals.

13 May — National Science Foundation, commenting to the Division of Polar Programs on a draft discussion paper for the Group of Experts on Environmental Monitoring; noting that, in some cases, the draft suggests objectives that are not consistent with the objectives of environmental monitoring as set forth in the Protocol on Environmental Protection to the Antarctic Treaty; forwarding a redraft of several sections; and recommending that the paper clearly reflect and build upon the relevant provisions of the Protocol.

15 May — Commerce, modification of scientific research permit, Scott D. Kraus.

15 May — Commerce, modification of scientific research permit, Susan H. Shane.

15 May — Commerce, commenting to the National Marine Fisheries Service on a proposed rule to remove the eastern North Pacific (California) gray whale population from the endangered species list; noting that the Commission does not recommend delisting of the gray whale; further noting that significant progress towards recovery has been made; and recommending that the Service (1) describe proposed programs to monitor the effects of human activities and development in preferred feeding and breeding areas and migration routes; (2) conduct a more comprehensive assessment of present and foreseeable threats to breeding lagoons, feeding grounds, and other biologically important areas; (3) in cooperation with the Department of State, pursue negotiations with the Governments of Mexico, Canada, and the former Soviet Union to conclude an agreement on protecting gray whales and their habitat; (4) undertake a more complete review of jeopardy opinions issued pursuant to section 7 of the Endangered Species Act; and (5) continue to undertake additional research recommended by the International Whaling Commission in its report on the 1990 Comprehensive Assessment of gray whales.

18 May — Commerce, public display permit, Zoo Parquesan.

26 May — Commerce, modification of scientific research permit, Alaska Fisheries Science Center.

27 May — Commerce, scientific research permit, Alaska Fisheries Science Center.

28 May — Commerce, modification of scientific research permit, Bruce R. Mate.

5 June — Commerce, scientific research permit, James H.W. Hain.

8 June — Commerce, commenting to the National Marine Fisheries Service on observer data for high seas driftnet fisheries in the North Pacific Ocean; noting that the level of observer coverage has been

determined with a statistical method that assumes catch of species is distributed evenly among participating vessels; further noting that, because catch is highly aggregated for certain species, the observer coverage required by the Service and foreign fisheries agencies to estimate catch levels may not be sufficient to achieve the degree of desired accuracy; and recommending, among other things, that the Service (1) investigate the aggregation levels in the bycatch of different species and determine the appropriate statistical tools to characterize the bycatch for the 1990-1991 driftnet fishing seasons; and (2) review the nature of the observer data and the statistical methods used to determine the level of effort in other fishery observer programs.

9 June — Commerce, modification of scientific research permit, Southwest Fisheries Science Center.

9 June — Commerce, commenting further to the U.S. Commissioner to the International Whaling Commission on recommended U.S. policy regarding commercial whaling; and recommending that the National Oceanic and Atmospheric Administration (1) undertake a study to determine the sensitivity of the Revised Management Procedure to the varying precision of input parameters; and (2) coordinate a workshop to address various issues of multi-species interactions with special reference to whales.

9 June — Commerce, scientific research permit, Northwest and Alaska Fisheries Science Center.

10 June — Army Corps of Engineers, Interior, and the Florida Department of Natural Resources, commenting on the effect of a proposed public viewing area for manatees at Port Everglades, Florida; and recommending that the agencies exercise caution before approving any development permits for the proposed facilities and activities at Port Everglades.

12 June — Western Pacific Regional Fishery Management Council, commenting on an environmental assessment for Proposed Amendment 6 to the Fishery Management Plan for Pelagic Fisheries; noting an inaccuracy in the Council's interpretation of the requirements for fisheries listed under Category III of the Service's list of fisheries; and recommending that the assessment be revised to clarify the reporting requirements for marine mammal-fisheries interactions; requesting information in fishing logbooks on (1) Hawaiian monk seal distribution beyond 50 nautical miles from land; (2) interactions between monk seals and pelagic fisheries; and (3) disposal or loss of light sticks from fishing vessels; and also requesting information on recent Council deliberations regarding actions to require tracking equipment aboard longline vessels.

16 June — Commerce, commenting to the National Marine Fisheries Service on a funding request to investigate an apparent change in the distribution of several whale and dolphin species off New England; and recommending that the Service conduct aerial surveys and other studies to identify possible factors causing the change.

17 June — Interior, commenting to the Fish and Wildlife Service on the activities and support needed to continue to meet Service research and management obligations for Florida manatee recovery work through Fiscal Year 1997; noting that, for the Sirenia Project, (1) certain earlier funding and personnel projections are no longer valid; (2) changes have occurred in the projected needs for basic life history and ecology studies; and (3) a program is needed to monitor the condition of essential manatee feeding habitats; further noting that, for the Jacksonville Field Office, (1) earlier funding projections for public information and education are higher than necessary, and (2) although the management staff has been increased, the current level does not place the office in a position to meet all its obligations; also noting that the Crystal River National Wildlife Refuge needs a stronger public information and awareness program to educate Refuge visitors about manatee protection issues and requirements; and recommending, among other things, that, over the next five years, the Service plan for and provide total annual funding for Florida manatee recovery work by the Sirenia Project, the Jacksonville Field Office, and the Crystal River National Wildlife Refuge at the following levels: $1,189,000 in 1993; $1,092,000 in 1994; $987,000 in 1995; $1,015,000 in 1996; and $999,000 in 1997.

17 June	Interior, commenting to the Fish and Wildlife Service on manatee protection in certain National Wildlife Refuges; noting the need for greater public education efforts in the Crystal River National Wildlife Refuge and the need for further land acquisition along the Crystal River and in the area of the Pelican Island National Wildlife Refuge; and recommending that the Service (1) provide additional funding for a public awareness program and a visitor center at the Crystal River Refuge; (2) prepare a report and proposal for purchasing lands along Crystal River; and (3) pursue negotiations with the State of Florida to give the Pelican Island National Wildlife Refuge staff the authority to manage surrounding submerged lands.
19 June	Interior, scientific research permit, Alaska Fish and Wildlife Research Center.
23 June	Commerce, modification of scientific research permit, Elizabeth A. Mathews.
23 June	Commerce, modification of scientific research permit, Southwest Fisheries Science Center.
23 June	Commerce, scientific research permit, Randall Davis and Bruce R. Mate.
28 June	Interior, commenting to the Fish and Wildlife Service on the need for a conservation plan for polar bears; forwarding a suggested draft plan; recommending, among other things, that the Service solicit comments on the suggested draft plan, prepare a final draft conservation plan, and circulate the final draft to the Commission and others for review; and further recommending that (1) the Solicitor's Office and the Service's Polar Bear Management Plan Advisory Team identify legislation necessary to implement all provisions of the International Agreement on the Conservation of Polar Bears; and (2) to better determine population discreteness, status, and trends, the Service provide the Planning Team with all vital parameters of the polar bear populations of the Chukchi and Beaufort Seas.
29 June	Commerce, modification of two scientific research permits, Steven K. Katona.
1 July	Commerce, scientific research permit, Ervin and Sonja Strong.
1 July	National Science Foundation, commenting on the international need for a manual to monitor persistent marine debris; noting that such a manual had recently been prepared for the U.S. Marine Entanglement Research Program; and recommending that the head of the U.S. delegation for the eighth session of the Intergovernmental Oceanographic Commission's Working Group on Global Investigation of Pollution in the Marine Environment (1) take steps to publish the manual in its series of pollution monitoring manuals; and (2) invite the manual's primary author to serve on the U.S. delegation to that meeting to present the document and address questions and comments.
2 July	Commerce, modification of scientific research permit, William A. Watkins.
2 July	Interior, commenting to the Minerals Management Service on a Draft Environmental Impact Statement for Gulf of Mexico Sales #142 and #143; noting that the draft does not thoroughly assess possible direct or indirect effects of the proposed action on marine mammals; and recommending, among other things, that the draft be expanded to describe requirements of the Marine Mammal Protection Act and actions that will be taken to ensure that lessees are aware of the Act's provisions on taking marine mammals incidental to offshore oil and gas activities.
8 July	Commerce, two scientific research permits, Southwest Fisheries Science Center.
8 July	Interior, scientific research permit, Kevin T. Schulz.
8 July	Commerce, commenting to the National Marine Fisheries Service on a proposed marine mammal monitoring plan for an offshore oil exploration project and a petition for developing regulations to

authorize take of ringed seals incidental to on-ice seismic exploration activities; noting that cumulative on-ice seismic activities may adversely affect ringed seal populations; and recommending that the Service consult with the Minerals Management Service, the Fish and Wildlife Service, the Alaska Department of Fish and Game, and relevant industry and Native groups to arrange cooperative funding of a monitoring program for Alaska ringed seal population(s).

8 July — Commerce, commenting to the National Marine Fisheries Service on its proposed 1993 categorization of fisheries incidentally taking marine mammals; noting that the Service proposes no changes from its 1992 list; further noting that the Service has not provided the Commission with previously requested incidental take data and that the Commission therefore has no basis for determining whether changes to the list of fisheries are needed; and reiterating previous recommendations that the Service make available a summary of data collected under the interim exemption program and adopt a procedure to update the summary routinely.

10 July — Commerce, modification of scientific research permit, Bernd G. Würsig.

16 July — Commerce, scientific research permit, Warren M. Zapol.

23 July — Commerce, commenting to the National Marine Fisheries Service on its policy for monitoring marine mammals exported to foreign facilities; and recommending that, pending adoption of new permit regulations and/or completion of a review of current policies, the Service modify existing permit procedures to enhance compliance by foreign facilities with permit terms and conditions set by the Service.

24 July — Interior, public display permits, Niigata City Aquarium, Yomuriland Marine Aquarium, Noboribetsu Hokkaido Marine Park, and Osaka Waterfront Aquarium.

5 August — Commerce, commenting to the National Marine Fisheries Service on a proposal to collect, rehabilitate, and release emaciated juvenile Hawaiian monk seals; requesting that the Service advise the Commission of any actions planned or performed on assessing prey resources at the collection site (French Frigate Shoals) and release site (Midway Island); and recommending, among other things, that a representative subset of rehabilitated animals be released at French Frigate Shoals and that satellite-linked radio tags and archival depth-of-dive tags be attached to at least a subset of rehabilitated animals prior to release.

5 August — State, commenting to the Office of Oceans and International Environmental and Scientific Affairs on the draft report of the Interim Scientific and Technical Advisory Committee for the Protocol concerning Specially Protected Areas and Wildlife in the Wider Caribbean Region; noting that several provisions of the draft rules of procedure for the Scientific and Technical Advisory Committee seem inappropriate; and recommending that several changes and additions to the rules be incorporated before their adoption.

11 August — Commerce, scientific research permit, Michael D. Scott.

25 August — Commerce, commenting to the National Marine Fisheries Service on reported allegations of abuse, poor handling, and substandard veterinary care of certain stranded dolphins being rehabilitated at a facility in Florida; and recommending that the National Marine Fisheries Service and the Animal and Plant Health Inspection Service investigate, and, as necessary, advise those responsible for maintaining the animals of all steps needed to be taken to provide proper care.

26 August — Interior, modification of scientific research permit, Donald B. Siniff.

27 August — Commerce, commenting to the National Marine Fisheries Service on the report of a meeting to review

permit issues related to humpback and killer whale research; forwarding a suggested draft section describing the purposes and requirements of the Marine Mammal Protection Act for the meeting report; and recommending, among other things, that certain background information be included in the report for the benefit of individuals who did not attend the meeting.

28 August — Commerce, commenting to the National Marine Fisheries Service on proposed rules to designate the eastern spinner dolphin and the northern offshore stock of the spotted dolphin as depleted under the Marine Mammal Protection Act; and recommending, among other things, that the final rule discuss (1) the magnitude of stock declines during the 1960s and 1970s and the Service's best estimate of pre-exploitation stock abundance; (2) the possible consequences of the depleted designations and the actions the Service would take following such findings; and (3) whether the Service intends to prepare conservation plans for the dolphins in question.

28 August — Commerce, commenting to the National Marine Fisheries Service on the report of the first meeting of the Steering Committee for the Third International Conference on Marine Debris; forwarding a mailing list of people to be advised of the next conference; and recommending additions and modifications to the terms of reference and schedule of the proposed conference.

31 August — Commerce, modification of scientific research permit, Southwest Fisheries Science Center.

2 September — Commerce, scientific research permit, Kathryn A. Ono.

2 September — Commerce, scientific research permit, James T. Harvey.

2 September — Commerce, modification of scientific research permit, Southeast Fisheries Science Center.

2 September — Commerce, commenting to the National Marine Fisheries Service on its proposed 1993 categorization of fisheries incidentally taking marine mammals; noting that the Service proposed no changes from its 1992 list; further noting that the Service failed to provide the Commission with a previously requested summary of incidental take data collected under the interim exemption program; and recommending that the deadline for comments on the proposed list be extended until the data summary is made available and reviewed by the Commission.

4 September — State, commenting to the Office of Oceans and Polar Affairs on a paper entitled "Antarctic Tourism and the Environmental Protocol"; and recommending several changes to the paper to strengthen the argument that many of the concerns regarding Antarctic tourism are addressed in the Protocol on Environmental Protection to the Antarctic Treaty.

11 September — Agriculture, commenting to the Animal and Plant Health Inspection Service on the death of a captive Atlantic bottlenose dolphin; and recommending that the cause of death be investigated.

21 September — National Research Council, commenting to the Board on Environmental Studies and Toxicology on a draft report assessing the U.S. Outer Continental Shelf Environmental Studies Program; and recommending that the draft report (1) better indicate the need for a separate budget and staff for the Outer Continental Shelf Scientific Committee; and (2) discuss the Marine Mammal Protection Act's prohibition on the taking of marine mammals incidental to offshore oil and gas exploration and development unless a waiver of the prohibition has been obtained.

24 September — Commerce, scientific research permit, J. Ward Testa and Michael A. Castellini.

28 September — Interior, enhancement permit, Fish and Wildlife Service.

29 September — Commerce, commenting to the National Marine Fisheries Service on surveys to document a decline in

harbor seal numbers; concurring with Service plans to contract for the development of a harbor seal conservation plan; and requesting that the Service inform the Commission as to the status of this plan.

29 September — Commerce, commenting to the National Marine Fisheries Service on the need for actions to restore Steller sea lion populations; and requesting information on the status of (1) the adoption and implementation of the Steller Sea Lion Recovery Plan; (2) the designation of critical habitat; and (3) the status of the Steller Sea Lion Recovery Team.

5 October — Interior, commenting to the Minerals Management Service on a call for information for Lease Sale #158 in the Gulf of Alaska-Yakutat Bay area; forwarding Commission papers on monitoring marine mammal populations and habitat and available data on harbor seals in Alaska; noting that, of the 17 species of marine mammals known to occur in the Gulf of Alaska and surrounding areas, the species of greatest concern are the gray whale, the harbor seal, the humpback whale, the killer whale, the North Pacific fur seal, the right whale, the sea otter, and the Steller sea lion; and recommending, among other things, that the Service contact the Alaska Department of Fish and Game, the National Marine Fisheries Service, and the Fish and Wildlife Service to (1) obtain the best available information on marine mammal habitat and habitat components that might be affected by oil and gas exploration and development in the proposed lease sale area; (2) obtain the best available information on types, distribution, and abundance of prey species utilized by marine mammals in the proposed lease sale area; (3) determine additional research or monitoring programs required to assess and detect effects of development on the various populations; and (4) identify measures that could be taken either to avoid or to mitigate possible adverse effects of the proposed action on marine mammals.

8 October — Commerce, commenting to the National Marine Fisheries Service on the Steller Sea Lion Recovery Plan, the Harbor Seal Recovery Plan, and the North Pacific Fur Seal Conservation Plan; forwarding a letter from the Alaska Department of Fish and Game to Recovery Team members; expressing support for the adoption of the Steller Sea Lion Recovery Plan by the end of October 1992; and requesting clarification of the status of the Harbor Seal Recovery Plan.

15 October — Commerce, commenting to the National Marine Fisheries Service on its proposed rule to allow the taking of ringed seals incidental to oil and gas exploratory activities in the Beaufort Sea; reiterating previous recommendations that the Service consult with the Minerals Management Service, the Fish and Wildlife Service, the Alaska Department of Fish and Game, and relevant industry and Native groups to arrange cooperative funding to monitor the status of ringed seals in Alaskan waters; and further recommending that the Service (1) assess the ability of the program to accurately estimate the number of ringed seals affected by the proposed activity and the nature and significance of any effects; and (2) identify and take into account activities that may affect ringed seals and their habitat in offshore areas.

16 October — Interior, commenting to the Fish and Wildlife Service on the need to update the Florida Manatee Recovery Plan; forwarding a discussion draft and step-down outline of research and management tasks for an updated plan; and recommending that the Service (1) consider the outline as a basis for revision of the Recovery Plan; (2) circulate the outline for review by the Florida Manatee Recovery Team; and (3) include revision of the Recovery Plan as an agenda item at the next Recovery Team meeting.

20 October — State of Florida, commenting to the Department of Natural Resources on proposed manatee protection rules for Duval County; supporting their adoption with the understanding that more extensive protective measures will be proposed in the near future as part of the County Manatee Protection Plan; and recommending that the rules be strengthened with regard to the lower St. Johns River by (1) expanding a slow speed zone near the city of Jacksonville; (2) establishing a year-round 25 mph speed limit in certain channels exempted from slow speed restrictions; and (3) either limiting access or requiring idle speed in areas immediately around artificial warm water refuges used by manatees.

21 October	Commerce, commenting to the National Marine Fisheries Service on the results of past meetings of the Hawaiian Monk Seal Recovery Team; noting that the Commission has received no information on the results of the February 1992 meeting; and requesting that the Service send the Commission (1) the minutes or any other report resulting from the meeting; (2) recommendations provided to the Service by the Team since the meeting; and (3) a description of the Service's follow-up actions to those recommendations.
21 October	Commerce, commenting to the National Marine Fisheries Service on the rehabilitation and movement of Hawaiian monk seals from French Frigate Shoals to Midway Island; and requesting information on (1) the results of monk seal prey analyses; (2) plans to radio-tag seals; (3) information from a December 1992 workshop concerning changes in the marine ecosystem of the Hawaiian Islands; and (4) copies of any updated analyses or plans to be reviewed at the next Recovery Team meeting.
22 October	Agriculture, commenting to the Animal and Plant Health Inspection Service on allegations concerning the mistreatment of animals at a center for treating stranded marine mammals; and recommending that the Service (1) have an experienced marine mammal trainer/behaviorist accompany its veterinarian while investigating the center; (2) consult with the National Marine Fisheries Service to ensure that appropriate steps are taken to identify and correct any inhumane or inappropriate practices; (3) in consultation with the National Marine Fisheries Service, compare survivorship rates of stranded dolphins brought to other area facilities; and (4) if the facility's record is substantially worse, inform the Commission of proposed actions to address the issue.
22 October	Commerce, modification of scientific research permit, Alaska Fisheries Science Center.
22 October	Commerce, scientific research permit, Bruce L. Homer.
22 October	Commerce, scientific research permit, National Zoological Park, Smithsonian Institution.
23 October	Commerce, modification of scientific research permit, National Marine Mammal Laboratory.
23 October	Commerce, commenting to the National Marine Fisheries Service on necropsy reports regarding captive marine mammals that died during Hurricane Andrew; and recommending that the Service assess factors contributing to their deaths and, as possible, ensure precautions are taken to prevent similar deaths in the future.
28 October	Commerce, commenting to the National Marine Fisheries Service on a petition pending since 1990 to designate critical habitat for right whales; noting that more than two years have passed since the Service received the petition; further noting that the Commission provided a report on the petitioned action to the Service early in 1991; recommending that the Service establish specific time limits for responding to petitions; and requesting the Service advise the Commission as to (1) what has been done to review and respond to the petition; (2) why the Service has failed to adopt the Commission's previous recommendation to proceed with the designation process; (3) whether the Service still plans to designate critical habitat and, if not, why not; (4) what steps and schedule will be followed if the Service plans to designate critical habitat; and (5) what steps have been taking to analyze data to determine if other areas adjacent to petitioned areas also merit critical habitat designation.
30 October	Commerce, modification of scientific research permit, J. Ward Testa.
4 November	Commerce, modification of scientific research permit, National Marine Mammal Laboratory.
11 November	Commerce, commenting to the National Marine Fisheries Service on the Northern Fur Seal Conservation Plan; and recommending that (1) the management section be expanded to describe the principles, objectives, and approaches that have existed under the past and present management authorities; (2)

high priority be accorded to publishing results of recent research; (3) the step-down outline be expanded to include tasks to develop a geographic information system and to oversee plan implementation; and (4) the Service redraft narrative portions of the plan to provide a more complete description of the contemplated work proposed under each task.

18 November — Commerce, commenting to the National Marine Fisheries Service on meetings of the Hawaiian Monk Seal Recovery Team; noting that a report of the last Recovery Team meeting has not yet been received; and recommending that the Service take immediate steps to provide minutes of the last meeting to the Recovery Team, the Commission, the staff of the Hawaiian Islands National Wildlife Refuge, and other appropriate individuals and groups.

23 November — Commerce, modification of scientific research permit, Dan R. Salden.

24 November — Commerce, modification of scientific research permit, Salvatore Cerchio.

24 November — Commerce, modification of scientific research permit, Phillip J. Clapham.

3 December — Commerce, commenting to the National Marine Fisheries Service on 11 proposals for research to obtain information necessary to implement the Service's recommended regime to govern marine mammal-fisheries interactions; recommending that, for certain proposals, the Service obtain more detailed information on the study methodologies, data needs, budget breakdowns, and personnel before deciding whether and at what level to support the work; also recommending that the Service consider whether proposed research could be done more cost-effectively by its staff or under contract; and further recommending that the Service (1) with regard to proposed studies of harbor seals, hold a workshop to compare, evaluate, and standardize research methods; (2) before funding a proposed continuation of research on humpback whales in the North Atlantic, ensure that more critical studies on right whales and Hawaiian humpback whales are funded adequately; (3) with regard to a proposed assessment of harbor seal populations in Alaska, ensure that data needs have been fully and accurately identified, determine whether certain additional studies are needed to satisfy minimum data requirements, and determine the likely level of incidental and subsistence take of harbor seals in the Aleutian Islands; (4) with regard to a proposed vessel-based survey of killer whales in Alaska, consider instead expanding on-going photo-identification studies and evaluating ways to reduce killer whale predation of fish caught in longline fisheries; and (5) with regard to proposed assessments of harbor porpoises in New England, Alaska, Washington, and Oregon, hold a workshop to compare, evaluate, and standardize research methods.

4 December — Commerce, modification of scientific research permits, James H.W. Hain and the Southeast Fisheries Science Center.

10 December — Commerce, public display permit, Cornish Seal Sanctuary.

10 December — Commerce, forwarding to the National Marine Fisheries Service a Commission-sponsored report on the possible use of a cooperative geographic information system to facilitate access to, and integration and analysis of, data bearing upon the conservation of marine mammals in Alaska; and recommending that (1) the Service convene a meeting of representatives of Federal and State agencies and private organizations to consider the feasibility of developing such a system; and (2) if meeting participants consider such a system desirable, the Service establish a working group to develop and oversee implementation of the system.

14 December — Commerce, scientific research permit, Randall S. Wells.

14 December — Commerce, scientific research permit, Joseph A. Cook.

15 December	State of Florida, commenting to the Florida Department of Natural Resources on proposed rules to establish boat speed limits and no-entry zones in certain waterways of Broward County to protect manatees; noting, in particular, the need for protecting manatees in the Intracoastal Waterway in southern Broward County; and recommending adoption of the proposed rules, including a slow speed zone in the aforementioned area.
16 December	Interior, scientific research permit, Florida Department of Natural Resources.
16 December	Commerce, public display permit, Colorado Springs Fine Arts Center.
16 December	Commerce, scientific research permit, Deborah A. Glockner-Ferrari and Mark Ferrari.
16 December	Commerce, scientific research permit, University of Hawaii.
18 December	Commerce, commenting to the National Marine Fisheries Service on the proposed 1993 Marine Entanglement Research Program Plan; noting that the plan proposes support for projects that appear to address urgent needs; and recommending that the Service proceed with implementing the plan.
22 December	Commerce, scientific research permit, Pacific Whale Foundation.
28 December	Commerce, commenting to the National Marine Fisheries Service on a scientific research permit requesting authorization to take humpback whales during the course of low frequency sound playback experiments; noting that the application does not contain sufficient information to determine if the planned research is likely to meet research objectives; and recommending, among other things, approval of the requested authorization only if the Service is satisfied that, among other things, position of sound source, maximum source of sound levels, and the number of research vessels involved, have been clearly identified and appropriately factored into the research design.
29 December	Commerce, scientific research permit, National Marine Mammal Laboratory.

APPENDIX B

REPORTS OF COMMISSION-SPONSORED ACTIVITIES AVAILABLE FROM THE NATIONAL TECHNICAL INFORMATION SERVICE (NTIS)[1]

Ainley, D.G., H.R. Huber, R.P. Henderson, and T.J. Lewis. 1977. Studies of marine mammals at the Farallon Islands, California, 1970-1975. Final report for MMC contract MM4AC002. NTIS PB-274 046. 42 pp. (A03)

Ainley, D.G., H.R. Huber, R.P. Henderson, T.J. Lewis, and S.H. Morrell. 1977. Studies of marine mammals at the Farallon Islands, California, 1975-1976. Final report for MMC contract MM5AC020. NTIS PB-266 249. 32 pp. (A03)

Ainley, D.G., H.R. Huber, S.H. Morrell, and R.R. LeValley. 1978. Studies of marine mammals at the Farallon Islands, California, 1976-1977. Final report for MMC contract MM6AC027. NTIS PB-286 603. 44 pp. (A03)

Allen, S.G. 1991. Harbor seal habitat restoration at Strawberry Spit, San Francisco Bay. Final report for MMC contract MM2910890-9. NTIS PB91-212332. 44 pp. (A03)

Allen, S.G., D.G. Ainley, and G.W. Page. 1980. Haul out patterns of harbor seals in Bolinas Lagoon, California. Final report for MMC contract MM8AC012. NTIS PB80-176910. 31 pp. (A03)

Anderson, D.M., and A.W. White. 1989. Toxic dinoflagellates and marine mammal mortality: Proceedings of an expert consultation held at Woods Hole Oceanographic Institution. Final report for MMC contract T6810848-1. NTIS PB90-160755. 71 pp. (A04)

Baker, C.S., J.M. Straley, and A. Perry. 1990. Population characteristics of humpback whales in southeastern Alaska: summer and late-season 1986. Final report for MMC contract MM3309822-5. NTIS PB90-252487. 23 pp. (A03)

Balcomb, K.C., J.R. Boran, R.W. Osborne, and N.J. Haenel. 1980. Observations of killer whales (*Orcinus orca*) in greater Puget Sound, State of Washington. Final report for MMC contract MM1300731-7. NTIS PB80-224728. 42 pp. (A03)

Bean, M.J. 1984. United States and international authorities applicable to entanglement of marine mammals and other organisms in lost or discarded fishing gear and other debris. Final report for MMC contract MM2629994-7. NTIS PB85-160471. 56 pp. (A04)

Beddington, J.R., and H.A. Williams. 1980. The status and management of the harp seal in the north-west Atlantic. A review and evaluation. Final report for MMC contract MM1301062-1. NTIS PB80-206105. 127 pp. (A07)

Bengtson, J.L. 1978. Review of information regarding the conservation of living resources of the Antarctic marine ecosystem. Final report for MMC contract MM8AD055. NTIS PB-289 496. 148 pp. (A08)

Bishop, J.B. 1985. Summary report of gill and trammel net (set-net) observations in the vicinity of Morro Bay, California, 1 November 1983 - 31 August 1984. Final report for MMC contract MM2629900-2. NTIS PB85-150076. 14 pp. (A02)

Bockstoce, J. 1978. A preliminary estimate of the reduction of the western Arctic bowhead whale (*Balaena mysticetus*) population by the pelagic whaling industry: 1848-1915. Final report for MMC contract MM7AD111. NTIS PB-286 797. 32 pp. (A08)

Brownell, R.L., Jr., C. Schonewald, and R.R. Reeves. 1978. Preliminary report on world catches of marine mammals 1966-1975. Final report for MMC contract MM6AC002. NTIS PB-290 713. 353 pp. (A16)

Buckland, S.T., and K.L. Cattanach. 1990. Review of current population abundance estimates of small cetaceans in the Black Sea. Final report for MMC contract T75133135. NTIS PB91-137257. 5 pp. (A02)

Chapman, D.G., L.L. Eberhardt, and J.R. Gilbert. 1977. A review of marine mammal census methods. Final report for MMC contract MM4AC014. NTIS PB-265 547. 55 pp. (A04)

Contos, S.M. 1982. Workshop on marine mammal-fisheries interactions. Final report for MMC contract MM207934-1-0. NTIS PB82-189507. 64 pp. (A04)

Cornell, L.H., E.D. Asper, K.N. Osborn, and M.J. White, Jr. 1979. Investigations on cryogenic marking procedures for marine mammals. Final report for MMC contract MM6AC003. NTIS PB 291 570. 24 pp. (A03)

Dayton, P.K., B.D. Keller, and D.A. Ven Tresca. 1980. Studies of a nearshore community inhabited by sea otters. Final report for MMC contracts MM6AC026 and MM13-00702-9. NTIS PB81-109860. 91 pp. (A06)

DeBeer, J. 1980. Cooperative dedicated vessel research program on the tuna-porpoise problem: overview and final report. Final report for MMC contract MM8AC006. NTIS PB80-150097. 43 pp. (A03)

Dohl, T.P. 1981. Remote laser branding of marine mammals. Final report for MMC contract MM4AC011. NTIS PB81-213449. 34 pp. (A03)

Erickson, A.W. 1978. Population studies of killer whales (*Orcinus orca*) in the Pacific Northwest: a radio-marking and tracking study of killer whales. Final report for MMC contract MM5AC012. NTIS PB-285 615. 34 pp. (A03)

Fay, F.H., H.M. Feder, and S.W. Stoker. 1977. An estimation of the impact of the Pacific walrus population on its food resources in the Bering Sea. Final report for MMC contracts MM4AC006 and MM5AC024. NTIS PB-273 505. 38 pp. (A03)

[1] **Price codes for printed reports (including postage) are shown in parentheses at the end of each citation. The key to the codes and order information can be found at the end of Appedix B.**

Fay, F.H., B.P. Kelly, and B.A. Fay (eds). 1990. The ecology and management of walrus populations – report of an international workshop. Final report for MMC contract T 68108850. NTIS PB91-100479. 186 pp. (A09)

Forestell, P.H. 1989. Assessment and verification of abundance estimates, seasonal trends, and population characteristics of the humpback whale in Hawaii. Final report for MMC contract MM2911014-6. NTIS PB90-190273. 66 pp. (A04)

Foster, M.A. 1981. Identification of ongoing and planned fisheries in the Northwestern Hawaiian Islands. Final report for MMC contract MM1801069-7. NTIS PB81-207 516. 90 pp. (A05)

Foster, M.S., C.R. Agegian, R.K. Cowen, R.F. Van Wagenen, D.K. Rose, and A.C. Hurley. 1979. Toward an understanding of the effects of sea otter foraging on kelp forest communities in central California. Final report for MMC contract MM7AC023. NTIS PB-293 891. 60 pp. (A04)

Fowler, C.W., W.T. Bunderson, M.B. Cherry, R.J. Ryel, and B.B. Steele. 1980. Comparative population dynamics of large mammals: a search for management criteria. Final report for MMC contract MM7AC013. NTIS PB80-178 627. 330 pp. (A15)

Fowler, C.W., R.J. Ryel, and L.J. Nelson. 1982. Sperm whale population analysis. Final report for MMC contract MM8AC009. NTIS PB82-174335. 35 pp. (A03)

Fox, W.W., Jr., et al. 1990. Statement of concerned scientists on the reauthorization of the Magnuson Fishery Conservation and Management Act. NTIS PB91-127647. 6 pp. (A02)

Freeman. J., and H. Quintero. 1990. The distribution of West Indian manatees (*Trichechus manatus*) in Puerto Rico: 1988-1989. Final report for MMC contract T5360348-3. NTIS PB 91-137240. 38 pp. (A03)

Gaines, S.E., and D. Schmidt. 1978. Laws and treaties of the United States relevant to marine mammal protection policy. Final report for MMC contract MM5AC029. NTIS PB-281 024. 668 pp. (A99)

Gard, R. 1978. Aerial census, behavior, and population dynamics study of gray whales in Mexico during the 1974-75 calving and mating season. Final report for MMC contract MM5AC006. NTIS PB-275 295. 18 pp. (A02)

Gard, R. 1978. Aerial census and population dynamics study of gray whales in Baja California during the 1976 calving and mating season. Final report for MMC contract MM6AC014. NTIS PB-275 297. 20 pp. (A03)

Geraci, J.R., and D.J. St. Aubin. 1979. Biology of marine mammals: insights through strandings. Final report for MMC contract MM7AC020. NTIS PB-293 890. 343 pp. (A16)

Geraci, J.R., S.A. Testaverde, D.J. St. Aubin, and T.H. Loop. 1978. A mass stranding of the Atlantic white sided dolphin, *Lagenorhynchus acutus*: a study into pathobiology and life history. Final report for MMC contract MM5AC008. NTIS PB-289 361. 141 pp. (A08)

Gerrodette, T. 1983. Review of the California sea otter salvage program. Final report for MMC contract MM2629677-5. NTIS PB83-262949. 23 pp. (A03)

Gilbert, J.R., V.R. Schurman, and D.T. Richardson. 1979. Grey seals in New England: present status and management alternatives. Final report for MMC contract MM7AC002. NTIS PB-295 599. 40 pp. (A03)

Glockner-Ferrari, D.A., and M.J. Ferrari. 1985. Individual identification, behavior, reproduction, and distribution of humpback whales, *Megaptera novaeangliae*, in Hawaii. Final report for MMC contract MM262975-5. NTIS PB85-200772. 36 pp. (A03)

Gold, J. 1981. Marine mammals: a selected bibliography. Final report for MMC contract MM1801254-3. NTIS PB 82-104282. 91 pp. (A05)

Gonsalves, J.T. 1977. Improved method and device to prevent porpoise mortality: application of polyvinyl panels to purse seine nets. Final report for MMC contract MM6AC007. NTIS PB-274 088. 28 pp. (A03)

Goodman, D. 1978. Management implications of the mathematical demography of long lived animals. Final report for MMC contract MM8AD008. NTIS PB-289 678. 80 pp. (A05)

Green, K.A. 1977. Antarctic marine ecosystem modeling revised Ross Sea model, general Southern Ocean budget, and seal model. Final report for MMC contract MM6AC032. NTIS PB-270 375. 111 pp. (A06)

Green-Hammond, K.A. 1980. Fisheries management under the Fishery Conservation and Management Act, the Marine Mammal Protection Act, and the Endangered Species Act. Final report for MMC contract MM1300885-3. NTIS PB80-180 599. 186 pp. (A09)

Green-Hammond, K.A. 1981. Requirements for effective implementation of the Convention on the Conservation of Antarctic Marine Living Resources. Final report for MMC contract MM2079173-9. NTIS PB82-123571. 36 pp. (A03)

Green-Hammond, K.A. 1982. Environmental aspects of potential petroleum exploration and exploitation in Antarctica: forecasting and evaluating risks. Final report for MMC contract MM2079173-9. NTIS PB82-169772. 28 pp. (A03)

Green-Hammond, K.A., D.G. Ainley, D.B. Siniff, and N.S. Urquhart. 1983. Selection criteria and monitoring requirements for indirect indicators of changes in the availability of Antarctic krill applied to some pinniped and seabird information. Final report for MMC contract MM2324753-6. NTIS PB83-263 293. 37 pp. (A03)

Hain, J.H.W. 1992. Airships for marine mammal research: evaluation and recommendations. Final report for MMC contract T68108863. NTIS PB92-128271. 37 pp. (A03)

Hatfield, B.B. 1991. Summary report of observations of coastal gill and trammel net fisheries in central California - October 1, 1984 - March 31, 1985. Final report for MMC contract MM2910891-2. NTSI PB91-191908. 17 pp. (A03)

Heneman, B., and Center for Environmental Education. 1988. Persistent marine debris in the North Sea, northwest Atlantic Ocean, wider Caribbean area, and the west coast of Baja California. Final report for MMC contract MM3309598-5. NTIS PB89-109938. 161 pp. (A08)

Henry, M.E. 1987. Observations of gill and trammel net fishing activity between Pt. Buchon and Pt. Sur, California, June-October 1985. Final report for MMC contract MM3309511-8. NTIS PB87-184024. 30 pp. (A03)

Herman, L.M., P.H. Forestell, and R.C. Antinoja. 1980. The 1976/77 migration of humpback whales into Hawaiian waters: composite description. Final report for MMC contracts MM7AC014 and MM1300907-2. NTIS PB80-162 332. 55 pp. (A04)

Hofman, R.J. (ed). 1979. A workshop to identify new research that might contribute to the solution of the tuna-porpoise problem. Proceedings of a Marine Mammal Commission-sponsored workshop held on 8-9 December 1975 at the University of California, Santa Cruz. NTIS PB-290 158. 17 pp. (A02)

Hofman, R.J. 1982. Identification and assessment of possible alternative methods for catching yellowfin tuna. NTIS PB83-138 993. 243 pp. (A11)

Hofman, R.J. (ed). 1985. Workshop to assess methods for regulating the distribution and movements of sea otters. Report of a Marine Mammal Commission-sponsored workshop held 25-26 October 1984 in San Francisco, California. NTIS PB85-229250. 39 pp. (A03)

Hoover-Miller, A. 1992. Assessment of the possible use of a cooperative/coordinated geographic information system (GIS) to facilitate access to, and integration and analysis of, data bearing upon the conservation of marine mammals in Alaska. Final report for MMC contract T75136297. NTIS PB93-128429. 59 pp. (A04)

Huber, H.R., D.G. Ainley, R.J. Boekelheide, R.P. Henderson, and B. Bainbridge. 1981. Studies of marine mammals at the Farallon Islands, California, 1979-1980. Final report for MMC contract MM1533599-3. NTIS PB81-167082. 51 pp. (A04)

Huber, H.R., D.G. Ainley, S.H. Morrell, R.J. Boekelheide, and R.P. Henderson. 1980. Studies of marine mammals at the Farallon Islands, California, 1978-1979. Final report for MMC contract MM1300888-2. NTIS PB80-178197. 46 pp. (A04)

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Hui, C.A. 1978. Reliability of using dentin layers for age determination in *Tursiops truncatus*. Final report for MMC contract MM7AC021. NTIS PB-288444. 25 pp. (A03)

Irvine, A.B., M.D. Scott, R.S. Wells, J.H. Kaufmann, and W.E. Evans. 1979. A study of the activities and movements of the Atlantic bottlenosed dolphin, *Tursiops truncatus*, including an evaluation of tagging techniques. Final report for MMC contracts MM4AC004 and MM5AC018. NTIS PB-298 042. 54 pp. (A04)

Jameson, G.L. 1986. Trial systematic salvage of beach-cast sea otter, *Enhydra lutris*, carcasses in the central and southern portion of the sea otter range in California: one year summary of results: October 1983-September 1984. Final report for MMC contract MM2629849-8. NTIS PB87-108288. 60 pp. (A04)

Jeffries, S.J. 1986. Seasonal movement and population trends of harbor seals (*Phoca vitulina richardsi*) in the Columbia River and adjacent waters of Washington and Oregon, 1976-1982. Final report for MMC contract MM2079357-5. NTIS PB86-200243. 41 pp. (A03)

Jeffries, S.J., and M.L. Johnson. 1990. Population status and condition of the harbor seal, *Phoca vitulina richardsi*, in the waters of the State of Washington: 1975-1980. Final report for MMC contract MM7AC030. NTIS PB90-219197. 70 pp. (A05)

Johnson, B.W., and P.A. Johnson. 1978. The Hawaiian monk seal on Laysan Island: 1977. Final report for MMC contract MM7AC009. NTIS PB-285 428. 38 pp. (A03)

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Jones, M.L., and S.L. Swartz. 1986. Demography and phenology of gray whales and evaluation of human activities in Laguna San Ignacio, Baja California Sur, Mexico, 1978-1982. Final report for MMC contract MM2324713-8. NTIS PB86-219078. 69 pp. (A05)

Kasuya, T., and Y. Izumizawa. 1981. The fishery-dolphin conflict in the Iki Island area of Japan. Final report for MMC contract MM1533791-7. NTIS PB81-171357. 31 pp. (A03)

Katona, S.K. 1983. The Gulf of Maine whale sighting network: 1976. Final report for MMC contract MM6AC018. NTIS PB83-151290. 32 pp. (A03)

Katona, S.K., and S. Kraus. 1979. Photographic identification of individual humpback whales (*Megaptera novaeangliae*): evaluation and analysis of the technique. Final report for MMC contract MM7AC015. NTIS PB-298 740. 29 pp. (A03)

Kooyman, G.L. 1982. Development and testing of a time-depth recorder for marine mammals. Final report for MMC contract MM6AC019. NTIS PB82-257932. 10 pp. (A02)

Kraus, S.D. 1985. A review of the status of right whales (*Eubalaena glacialis*) in the western North Atlantic with a summary of research and management needs. Final report for MMC contract MM2910905-0. NTIS PB86-154143. 61 pp. (A04)

Kraus, S.D., and R.D. Kenney. 1991. Information on right whales (*Eubalaena glacialis*) in three proposed critical habitats in United States waters off the western North Atlantic Ocean. Final report for MMC contracts T75133740 and 75133753. NTIS PB91-194431. 65 pp. (A04)

Lefebvre, L.W., and J.A. Powell. 1990. Manatee grazing impacts on seagrasses in Hobe Sound and Jupiter Sound in southeast Florida during the winter of 1988-89. Final report for MMC contracts T62239152, T68108782. NTIS PB90-271883. 36 pp. (A03)

Lentfer, J.W. (ed). 1988. Selected marine mammals of Alaska: species accounts with research and management recommendations. Final report for MMC contract MM2910798-4. NTIS PB88-178462. 275 pp. (A013)

Lentfer, J.W. 1990. Workshop on measures to assess and mitigate the adverse effects of arctic oil and gas activities on polar bears. Final report. NTIS PB91-127241. 43 pp. (A03)

Loughlin, T. 1978. A telemetric and tagging study of sea otter activities near Monterey, California. Final report for MMC contract MM6AC024. NTIS PB-289 682. 64 pp. (A04)

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APPENDIX C

SELECTED LITERATURE PUBLISHED ELSEWHERE RESULTING FROM COMMISSION-SPONSORED ACTIVITIES

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