

MARINE MAMMAL COMMISSION

Annual Report to Congress

2006

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

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*Front cover: Photograph of bowhead whale by Craig George, North Slope Borough, Alaska.
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Chapter I

INTRODUCTION

This is the 34th Annual Report of the Marine Mammal Commission, covering the period 1 January through 31 December 2006. The Marine Mammal Commission is an independent agency of the Executive Branch established under Title II of the Marine Mammal Protection Act. The Commission consists of three members, one of whom serves as Chairman. All three are nominated by the President and confirmed by the U.S. Senate. The Act requires that Commissioners be knowledgeable in marine ecology and resource management.

The Commission is supported by a nine-member Committee of Scientific Advisors on Marine Mammals. Committee members are appointed by the Chairman with the concurrence of the other Commissioners and after consultation with the Chairman of the Council on Environmental Quality, the Secretary of the Smithsonian Institution, the Director of the National Science Foundation, and the Chairman of the National Academy of Sciences. The Marine Mammal Protection Act requires that committee members be scientists knowledgeable in marine ecology and marine mammal affairs. The work of the Commission is carried out primarily by its staff, located in Bethesda, Maryland.

The Marine Mammal Protection Act sets forth the Commission's duties as follows:

- (1) undertake a review and study of the activities of the United States pursuant to existing laws and international conventions relating to marine mammals, including, but not limited to, the International Convention for the Regulation of Whaling, the Whaling Convention Act of 1949, the Interim Convention on the Conservation of North Pacific Fur Seals, and the Fur Seal Act of 1966;
- (2) conduct a continuing review of the condition of the stocks of marine mammals, of methods for their protection and conservation, of humane means of taking marine mammals, of research programs conducted or proposed to be conducted under the authority of this Act, and of all applications for permits for scientific research, public display, or enhancing the survival or recovery of a species or stock;
- (3) undertake or cause to be undertaken such other studies as it deems necessary or desirable in connection with its assigned duties as to the protection and conservation of marine mammals;
- (4) recommend to the Secretary and to other federal officials such steps as it deems necessary or desirable for the protection and conservation of marine mammals;
- (5) recommend to the Secretary of State appropriate policies regarding existing international arrangements for the protection and conservation of marine mammals, and suggest appropriate international arrangements for the protection and conservation of marine mammals;
- (6) recommend to the Secretary such revisions of the endangered species list and threatened species list published pursuant to sec-

tion 4(c)(1) of the Endangered Species Act of 1973 as may be appropriate with regard to marine mammals; and

- (7) recommend to the Secretary, other appropriate federal officials, and Congress such additional measures as it deems necessary or desirable to further the policies of this Act, including provisions for the protection of the Indians, Eskimos, and Aleuts whose livelihood may be adversely affected by actions taken pursuant to this Act.

The purpose of this report is to review the Commission's activities in 2006 in light of those duties and to provide timely information on management issues and events under the Commission's purview in 2006.

We begin the report with a perspective on the issues shaping the Act and the Commission's past and present activities, as well as its future directions. The perspective is taken from a manuscript written by John R. Twiss Jr., the Commission's Executive Director from 1975 to 2000; Robert J. Hofman, the Scientific Program Director from 1976 to 2000; and John E. Reynolds III, former member and chairman of the Committee of Scientific Advisors on Marine Mammals and Commission Chairman from 1991 to the present. The paper will be published in the volume *Foundations of Environmental Sustainability: The Co-Evolution of Science and Policy*, to be published in fall 2007 by Oxford University Press. Portions of the manuscript are included here with the gracious permission of Oxford University Press.

We begin this report with the Twiss et al. manuscript because we believe it is essential to evaluate our nation's conservation efforts using a long-term perspective. In the coming years, our conservation challenges will persist and intensify due to the world's expanding human population, the accompanying socioeconomic growth, and the resulting demands placed on marine resources and the marine ecosystem. Failure to study and understand our nation's past efforts to achieve conservation of marine mammals and marine

ecosystems increases the risk that we will repeat past errors or fail to build on past successes.

Chapter III of this report discusses efforts made during 2006 to reauthorize the Marine Mammal Protection Act. Chapter IV describes several current or recently completed projects undertaken by the Commission at the direction of Congress, including reports on the effects of sound in the marine environment, the ecological role of killer whales in the North Pacific, and the cost-effectiveness of recovery programs for the most endangered marine mammals in U.S. waters. Chapter V focuses on Commission activities related to climate change and its potentially profound effects on marine mammals and ecosystems. Chapter VI describes current and future issues for marine mammal species of special concern that occur primarily or regularly in U.S. waters, as well as some species that occur in foreign and international waters. Chapters VII, VIII, and IX address matters pertinent to marine mammal/fishery interactions, international management of marine mammals, and permits and authorizations to take marine mammals, respectively. Chapter X discusses issues involving marine mammal health and stranding events, and Chapter XI describes the activities of the Commission's research and studies program.

The Commission submits its reports to Congress pursuant to section 204 of the Marine Mammal Protection Act of 1972. The Commission also provides its reports to federal and state agencies, public interest groups, the academic community, private citizens, and the international community. This and similar reports for years beginning in 2000 also are available on the Commission's Web site at www.mmc.gov/reports/annual. Collectively, these reports describe the evolution and progress of U.S. policies and programs to conserve marine mammals and their habitats. To ensure accuracy, federal and state agencies and knowledgeable individuals review report drafts before publication.

Chapter II

A RETROSPECTIVE VIEW OF MARINE MAMMAL CONSERVATION

*This chapter is based on a review of past issues in marine mammal conservation written by John R. Twiss Jr., the Executive Director of the Marine Mammal Commission from 1975 to 2000; Robert J. Hofman, the Commission's Scientific Program Director from 1976 to 2000; and John E. Reynolds III, past member and Chairman of the Commission's Committee of Scientific Advisors on Marine Mammals and Chairman of the Commission from 1991 to the present. The review is included in the volume **Foundations of Environmental Sustainability: The Co-Evolution of Science and Policy**, to be published by Oxford University Press in 2007. The Commission gratefully acknowledges Oxford University Press for its kind permission to use portions of that work here.*

Much of the past 30 years' history of marine mammal conservation is reflected in the background, content, implementation, and changes in the U. S. Marine Mammal Protection Act (MMPA) of 1972. The Act was one of a series of federal environmental laws enacted in the United States in the late 1960s and early 1970s in response to the then-growing awareness that human activities were threatening the natural resources and ecosystems upon which the welfare of humans depends. In addition to the MMPA, those laws included the Wild and Scenic Rivers Act of 1968, the National Environmental Policy Act of 1969, the Clean Air Act and the Coastal Zone Management Act of 1972, the Endangered Species Act of 1973, and the Fisheries Conservation and Management Act of 1976. In the years leading to passage of the MMPA, only one issue—the Vietnam War—generated more mail from the public to members of the U.S. Congress.

Three issues were of particular concern to Congress, the scientific community, and the public at the time the MMPA was being formulated:

- the killing of hundreds of thousands of dolphins each year in the eastern tropical Pacific Ocean as a result of setting purse seines around dolphin schools to catch yellowfin tuna that associate with the dolphins;
- the failure of the International Whaling Commission (IWC) to prevent the overexploitation and near-extinction of virtually all stocks of large whales throughout the world; and
- the clubbing and skinning of tens of thousands of newborn (baby) harp seals each year in the ice fields of the North Atlantic for the international fur market.

Since passage of the Act, a broad spectrum of additional issues has surfaced. These include declines of additional species and stocks in both U.S. and international waters. Examples include West Indian manatees (*Trichechus manatus*), West African manatees (*T. senegalensis*), California sea otters (*Enhydra lutris nereis*), Alaska sea otters (*E. l. kenyoni*), Steller sea lions (*Eumetopias jubatus*), Hawaiian monk seals (*Monachus schauinslandi*), Mediterranean monk seals (*M. monachus*), killer whales (orcas) (*Orcinus orca*), the Gulf of California harbor porpoise (vaquita) (*Phocoena sinus*), and the Chinese and Amazon River dolphins (*Platanista* spp.). Other issues include unintentional taking incidental to offshore oil and gas development and a variety of commercial fisheries; the taking of bowhead whales (*Balaena*

mysticetus) and other marine mammals by Alaska Natives for subsistence and handicraft purposes; increases in some populations of harbor seals (*Phoca vitulina*) and California sea lions (*Zalophus californianus*) and corresponding calls by fishermen and fisheries groups to cull the populations to limit their predation on commercially valuable fish stocks; unusual mortality events such as the massive die-off of bottlenose dolphins (*Tursiops truncatus*) that occurred along the U.S. mid-Atlantic coast in 1987 and 1988; and increasing threats associated with point and non-point sources of ocean pollution, lost and discarded fishing gear and other types of persistent marine debris, ship strikes, human sources of ocean noise, and ecosystem changes due to climate change and global warming.

The MMPA is unique in several respects:

- It is the first legislation anywhere in the world to mandate an ecosystem approach to the conservation of marine living resources.
- It establishes the concept of “optimum sustainable populations” (OSP).
- It is the first U.S. legislation to shift the burden from resource managers to resource users to show that proposed taking of marine living resources would not adversely affect the resources or the ecosystems of which they are a part (i.e., it prohibited the hunting, killing, capture, or harassment of marine mammals for other than scientific research, public display, or subsistence uses by Alaska Natives unless the advocate of the activity could provide reasonable evidence that the activity would not cause the affected species or stock to be reduced below its optimum sustainable level).
- It directs the relevant federal agencies to seek corresponding changes in international agreements such as the Whaling Convention and the North Pacific Fur Seal Convention.
- It established an independent overview body and scientific advisory group—the

Marine Mammal Commission and its Committee of Scientific Advisors—to oversee implementation of the Act and to advise Congress and the responsible regulatory agencies of needed actions.

It has been amended periodically to respond to problems that were unforeseen when it was enacted.

Key Provisions of the MMPA

In formulating the MMPA, the lawmakers determined that—

- certain species and population stocks of marine mammals were in danger of extinction and depletion as a result of human activities;
- such species and stocks should not be permitted to diminish below the level at which they cease to be significant functioning elements in the ecosystems of which they are a part and, consistent with this principal objective, should not be permitted to diminish below their optimum sustainable population level; and
- marine mammal species and population stocks should be encouraged to develop to the greatest extent feasible consistent with sound policies of resource management, with the primary objective of their management being to maintain the health and stability of the marine ecosystem.

Before enactment of the MMPA, individual states were responsible for conserving and regulating the take of marine mammals in their adjacent coastal waters. The Department of State was responsible for conserving and regulating the take of marine mammals on the high seas through international agreements such as the International Whaling Convention and the North Pacific Fur Seal Convention. Many marine mammals, such as the great whales, were viewed as commodities, like fish and shellfish, and were managed to obtain maximum sustainable yields, an outdated single-species management concept (cf. Holt and Talbot 1978). Others, such as harbor seals and California sea

lions, were viewed as vermin, competing with fishermen for fish and shellfish resources, and were the subject of bounty programs and unrestricted hunting.

The MMPA established a moratorium on the taking of marine mammals in U.S. waters and the importation of marine mammals and derived products into the United States. It assigned responsibility for whales, dolphins, porpoises, seals, and sea lions to the Department of Commerce, which in turn assigned most of those responsibilities to the National Marine Fisheries Service (NMFS). Responsibility for walruses, polar bears, manatees, dugongs, and sea and marine otters was assigned to the Department of the Interior, which in turn assigned most of its responsibilities to the Fish and Wildlife Service (FWS). The Secretary of State was directed to seek new international agreements and the amendment of existing agreements to further the purposes and policies of the Act.

Congress recognized that there were legitimate uses of marine mammals and marine mammal products and that states such as Alaska had vested interests in controlling the taking of marine mammals in their coastal waters and land areas. Consequently, the MMPA includes provisions for both waiving the moratorium on taking and returning management authority to states. Likewise, it recognizes the importance of marine mammal research and public education, and provides for permits to be issued by the responsible regulatory agencies—NMFS and FWS—authorizing the taking of marine mammals and importation of marine mammals and marine mammal products for scientific research and public display. It also recognizes that marine mammals often are caught unintentionally in commercial fisheries and provides that permits be issued to authorize such taking if it would not “disadvantage” the affected species or stocks. Further, the Act recognizes that many Alaska Natives residing along the coast are dependent on marine mammals for food and other subsistence needs. It therefore exempts

from the moratorium the hunting of marine mammals by Alaska Natives for subsistence and handicraft purposes, provided that taking does not threaten the continued existence of the affected species and stocks.

Implementation and Evolution of the Optimum Concept

Among other things, paragraph 6 of section 2 of the original MMPA states that—

...the primary objective of their [marine mammal] management should be to maintain the health and stability of the marine ecosystem. Whenever consistent with this primary objective, it should be the goal to obtain an optimum sustainable population keeping in mind the optimum carrying capacity of the habitat.

In section 3 of the original Act, the term “optimum sustainable population” was defined with respect to any population stock as—

the number of animals which will result in the maximum productivity of the population or the species, keeping in mind the optimum carrying capacity of the habitat and the health of the ecosystem of which they form a constituent element.

The term “optimum carrying capacity” was defined as—

the ability of a given habitat to support the optimum sustainable population of a species or population stock in a healthy state without diminishing the ability of the habitat to continue that function.

Subsequently it became clear that different interest groups had different interpretations of the terms “maximum productivity,” “optimum carrying capacity,” and “health of the ecosystem.” As an example, state and federal fish and marine mammal biologists generally viewed the term “maximum productivity” as analogous to the then generally accepted management goal of “maximum sustainable yield” (MSY). Therefore, they interpreted the terms “optimum carrying capacity” and “ecosystem health” to mean the habitat conditions that

would maintain marine mammal populations at their MSY levels. Environmental groups, however, generally viewed the terms to mean the greatest number of animals that could be supported by the habitat in its pristine state. The uncertainty was resolved as a result of a 1974 lawsuit regarding a permit issued by the National Marine Fisheries Service to the American Tunaboat Association authorizing the taking of unspecified numbers of dolphins in the eastern tropical Pacific (ETP) tuna purse seine fishery.

As indicated earlier, the deaths of hundreds of thousands of dolphins each year in the eastern tropical Pacific Ocean as a consequence of setting purse seines around dolphin schools to catch yellowfin tuna was one of the issues that led to enactment of the MMPA. Also, as indicated earlier, the Act provided that permits could be issued by the responsible regulatory authority—NMFS in this case—to authorize the taking of marine mammals incidental to commercial fisheries provided the taking would not disadvantage the affected marine mammal species or stocks.

The Richey Decision and the La Jolla Workshop: In September 1974 NMFS issued regulations to govern the taking of dolphins by U.S. vessels engaged in the tuna purse seine fishery in the eastern tropical Pacific. Subsequently the Service issued a permit to the American Tunaboat Association authorizing the encirclement and associated mortality of unspecified numbers of dolphins in the 1975 tuna fishing season. Following these actions, several environmental groups filed a lawsuit in federal court in Washington, D.C., claiming that the regulations and the permit issued to the association violated the MMPA because NMFS had not established a limit on the number of dolphins that could be encircled and killed and had not determined the size or status of the affected dolphin stocks relative to their OSP levels.

On 11 May 1976 Judge Charles R. Richey issued his findings in the case (*Committee for Humane Legislation Inc. v. Richardson et*

al.) (C.A. No. 74-1465). Among other things, Judge Richey found that NMFS had violated the intent and provisions of the MMPA by not establishing a limit on the species and number of dolphins that could be killed in the fishery and by not providing estimates of the sizes and optimum sustainable levels of the affected dolphin stocks. He issued an order voiding the regulations and the permit issued to the American Tunaboat Association. In partial response to that order, NMFS convened a group of experts, including the Chairman of the Marine Mammal Commission, to review available information and provide assessments of the sizes and OSP status of the affected dolphin stocks.

The workshop was held at NMFS' Southwest Fisheries Science Center in La Jolla, California. The participants identified 11 species and 21 stocks of dolphins subject to taking in the fishery. They estimated the then-current sizes of the species and stocks most affected using the results of a pilot aerial survey done by the Service in 1974 (Smith 1974). They also estimated the stock sizes before the beginning of the purse seine fishery in the late 1950s by back-calculating from the current estimates, using estimates of the annual fishery-related mortality and estimates of the likely maximum annual replacement rates. They concluded that the three stocks most affected by the fishery—the offshore stock of spotted dolphins (*Stenella attenuata*) and the eastern tropical Pacific stocks of eastern spinner and white-belly spinner dolphins (*S. longirostris*)—were approximately 64 percent, 54 percent, and 76 percent, respectively, of their pre-fishery or pre-exploitation sizes.

As indicated earlier, the MMPA's original definition of OSP was ambiguous in that its references to maximum productivity and optimum carrying capacity could be interpreted in different ways. The workshop participants therefore developed and used the following interpretive definition of the term to avoid the ambiguity—

Optimum sustainable population is a population size which falls within a range from

the population level of a given species or stock which is the largest supportable within the ecosystem to the population level that results in maximum net productivity.

Maximum net productivity is the greatest net annual increment in population numbers or biomass resulting from additions to the population due to reproduction and/or growth less losses due to natural mortality.

Finally, the participants concluded that the maximum net productivity levels (MNPL) of the dolphin stocks likely were between 50 and 70 percent of their carrying capacity levels and that 60 percent would be a prudent approximation when available information was insufficient, as in these cases, to determine the actual MNPL (Southwest Fisheries Science Center 1976). Thus, the eastern spinner stock was below and the offshore spotted stock was approaching the lower limit of their OSP range.

These workshop findings had three long-lasting effects on implementation of the MMPA: (1) the interpretive definition of OSP was adopted by both NMFS and FWS for regulatory purposes (50 CFR 216.3); (2) 60 percent of the estimated carrying capacity level was adopted, in the absence of information to the contrary, as the lower limit of the OSP range; and (3) back-calculation using estimates of current population size and annual mortality rates was accepted as a reasonable means for estimating pre-exploitation sizes or “optimum” carrying capacity.

It subsequently was recognized that there were redundancies in the MMPA’s original definitions of optimum sustainable population and optimum carrying capacity. Therefore, in the 1981 MMPA amendments, the definition of optimum carrying capacity was eliminated and the reference to “optimum carrying capacity” in the definition of OSP was changed to “carrying capacity.”

Details of these and other actions regarding the “tuna-dolphin” problem can be found in Gosliner (1999) and in the annual reports of the Marine Mammal Commission, NMFS, and the

Inter-American Tropical Tuna Commission. As indicated there, the number of dolphins killed annually in the eastern tropical Pacific tuna purse seine fishery has declined from more than 400,000 in 1972 when the MMPA was enacted to fewer than 5,000 since the early 1990s. However, it appears that the depleted stocks of spotted and spinner dolphins are not recovering, due possibly to unobserved or unreported mortality and/or stress caused by chase and capture.

The Kokechik Decision and the 1988 MMPA Amendments: In May 1987 NMFS issued a permit to the Japanese Salmon Fisheries Cooperative Association authorizing the take of up to 2,942 Dall’s porpoises (*Phocoenoides dalli*) annually, for a period of three years, incidental to salmon driftnet fishing in the U.S. 200-mile Fishery Conservation Zone off Alaska. Shortly after the permit was issued, several Native Alaskan fishing groups and environmental organizations filed suit claiming, among other things, that the permit violated the MMPA because it applied only to Dall’s porpoises when it was virtually certain that other marine mammals would also be taken, including northern fur seals from the depleted populations on St. Paul and St. George Islands. The court ruled in favor of the plaintiffs and issued a preliminary injunction voiding the permit. NMFS appealed the decision. However, the appellate court upheld the decision.

The decision in this case (*Kokechik Fishermen’s Association v. Secretary of Commerce*, 839 F.2d 795, D.C. Cir. 1988) cast doubt on the ability of NMFS to issue incidental take permits for other fisheries, including many domestic fisheries, for which there was insufficient information to reasonably conclude that all species and populations likely to be affected were at or above their maximum net productivity levels. Also, as noted earlier, the MMPA, with three exceptions, prohibited taking from endangered, threatened, or depleted species and stocks even in cases where the taking would have little or no effect on the recovery of those species or stocks.

Both the environmental community and the fishing industry, as well as the state and federal regulatory agencies, recognized that a total prohibition on the incidental taking of marine mammals would have a severe economic impact on a number of U.S. fisheries. In addition, it was clear that available information was insufficient in most cases to reliably assess and determine how to avoid or mitigate the adverse effects of interactions on the affected marine mammals and fisheries. Consequently, Congress amended the MMPA in 1988 to provide a five-year exemption to the Act's permit and "small-take" requirements for U.S. and certain foreign fisheries other than the eastern tropical Pacific tuna purse seine fishery covered by other provisions of the Act. The basic purposes of the five-year exemption were to provide time to (1) compile and analyze data on the types, levels, and biological and socioeconomic implications of marine mammal/fishery interactions in U.S. waters, and (2) develop a new regime to govern interactions that both avoids adverse effects on marine mammals and minimizes the impact on fisheries. Among other things, the amendments required that—

- owners of vessels engaged in fisheries that take marine mammals more than rarely in U.S. waters register with NMFS and report all incidents of interactions with marine mammals;
- by 23 March 1989 NMFS, in consultation with the Marine Mammal Commission and after opportunity for public comment, develop and then annually update lists identifying fisheries that take marine mammals frequently, occasionally, and rarely;
- 29 to 35 percent of fishing vessels engaged in Category I fisheries (fisheries identified as taking marine mammals frequently) be monitored by onboard NMFS observers;
- a volunteer observer or alternative observation program be developed by NMFS to obtain statistically reliable information on the species and numbers of marine mammals being taken incidentally in fisheries

for which observers are not required or are not available;

- NMFS design and implement an information management system capable of processing and analyzing incidental take and related data provided by fishermen, observers, and others;
- the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, develop and provide to NMFS recommended guidelines to govern the taking of marine mammals incidental to commercial fisheries in U.S. waters after 1 October 1993 when the interim exemption was scheduled to expire; and
- NMFS provide to Congress by 1 January 1992 its recommendations for a new regime to govern marine mammal/fishery interactions and a proposed schedule for implementing the regime.

The amendments themselves and the subsequent efforts by the Commission and NMFS to implement them resulted in several practical and philosophical changes to the regulation of marine mammal/fishery interactions. For example, the amendments directed that the guidelines for a new regulatory regime to be developed by the Commission take into account, among other things, the status and trends of the affected marine mammal species and stocks. In its recommended guidelines, provided to NMFS in July 1990, the Commission indicated that there was no compelling biological reason to have a categorical prohibition on the taking of endangered, threatened, or depleted species and stocks. It recommended, among other things, that the incidental take of marine mammals listed as endangered or threatened under the Endangered Species Act or depleted under the MMPA be authorized if the taking would not cause a further decline or impede recovery of the affected species or stocks.

The amendments also recognized—and the subsequent mandatory and voluntary observer programs implemented by NMFS confirmed—that placement of sufficient numbers of trained

observers aboard fishing vessels is necessary to obtain reliable information on fishing practices and on catches of both target and non-target species. Also, although most of NMFS' funding for and decisions regarding marine mammal research and management had previously been delegated by the Service to its regional management and science centers, following the 1988 amendments much of the marine mammal decision-making and funding authority was vested in the Service's Office of Protected Resources at its headquarters in Silver Spring, Maryland. Among other things, this minimized regional differences in perceptions of—and efforts to deal with—marine mammal research and management problems. Finally, the new regulatory regime proposed to Congress by NMFS in December 1992 suggested a new and simpler conceptual means for assuring that incidental take in commercial fisheries does not cause any marine mammal species or stock to be reduced or to be maintained below the lower limit of its OSP range as described earlier. That concept, calculation of potential biological removal (PBR) levels, was incorporated in the 1994 MMPA amendments as described here.

The 1994 MMPA Amendments (Public Law 103-238): Several significant changes to the MMPA's provisions regarding marine mammal/fishery interactions were enacted in 1994. Those changes reflected input from the fishing industry and the environmental community as well as from the Commission, NMFS, and FWS.

New section 117 required the preparation and periodic update of status reports for all marine mammal stocks in U.S. waters. It directed that each stock assessment (1) describe the geographic range of the stock; (2) provide a minimum abundance estimate, assessments of the stock's current and maximum net productivity rates and current trend, and a description of the information used to make those determinations; (3) estimate by source the level of annual human-caused mortality and serious injury, including for strategic stocks (see later discus-

sion) factors in addition to fishery-related mortality and injury that may be causing a decline or impeding recovery; (4) describe the commercial fisheries that interact with the stock, including the number of vessels in each fishery, fishery-specific estimates of mortality and serious injury levels and rates, any seasonal or area differences in incidental mortality or serious injuries, and whether the level of mortality and serious injury has achieved or is approaching the zero rate goal; (5) assess whether the level of mortality and serious injury is or is not likely to cause the stock to be reduced below the lower limit of its OSP range, and whether the stock should be classified as a strategic stock; and (6) indicate the PBR level for the stock and the information used to do the calculation (see later discussion). New section 117 also directed NMFS to establish regional scientific review groups for Alaska, the Pacific coast including Hawaii, and the Atlantic coast including the Gulf of Mexico to assist in preparing and updating the stock assessments. The latest versions of the stock assessment reports can be obtained on the Service's Office of Protected Resources Web site: www.nmfs.noaa.gov/pr/.

New section 118 established the replacement regime to govern the taking of marine mammals incidental to commercial fishing operations. Among other things, it mandated, with minor changes, the continuation of the vessel registration and observer programs established in accordance with the 1988 amendments. Further, it directed that take reduction plans be developed for each strategic stock that interacts with a Category I or Category II fishery (fisheries that, respectively, frequently or occasionally kill or seriously injure marine mammals) and that take reduction teams, composed of scientists and representatives of the various fishery and environmental interest groups, be constituted to draft the plans. The immediate goal of these plans is to identify measures that will reduce, within six months, fishery-related mortality and serious injury to less than the PBR levels calculated in the stock

assessments. The long-term goal is to reduce incidental mortality and serious injury to insignificant levels, approaching a zero rate, taking into account the economics of the fishery, existing technology, and applicable state or regional fishery management plans. To date, NMFS has established take reduction teams and take reduction plans for a variety of species and species groups, including right whales and other large whales in the Northwest Atlantic, harbor porpoises along parts of both the Atlantic and Pacific coasts, bottlenose dolphins along the mid-Atlantic coast, and sperm whales and other cetaceans off the Pacific coast. The take reduction plans, like the status of stocks reports, can be obtained through the Office of Protected Resources' Web site: www.nmfs.noaa.gov/pr/.

The term “strategic stock” was defined to mean a marine mammal stock—

- (A) for which the level of direct human-caused mortality exceeds the potential biological removal level;
- (B) which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the Endangered Species Act of 1973 within the foreseeable future; or
- (C) which is listed as a threatened species or endangered species under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) or is designated as depleted under this Act [the MMPA].

The term “potential biological removal level” was defined to mean the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. The PBR level is the product of the following factors:

- (A) the minimum population estimate of the stock;
- (B) one-half the maximum theoretical or estimated net productivity rate of the stock at a small population size; and
- (C) a recovery factor between 0.1 and 1.0.

Details of the amendments are described in the Marine Mammal Commission's report to Congress for calendar year 1994. Ongoing efforts to implement the amendments are described in subsequent Commission reports.

The intent of the PBR concept clearly was to provide conservative estimates of the number of marine mammals that could be removed annually from U.S. waters without causing the affected species and stocks to be reduced or maintained below the lower limit of the previously defined OSP range. However, some aspects of the definition were ambiguous. For example, nowhere in the amendments or the associated legislative history was there any indication of what was envisioned by the term “minimum population estimate,” or how the specified recovery factors were to be applied. Therefore, on 27–29 June 1994, NMFS convened a workshop of knowledgeable scientists and representatives of the Service, the Commission, and FWS to consider and provide advice on the most appropriate interpretations of the variables in the formula for calculating PBR levels (Wade 1994, Barlow et al. 1995, Wade and Angliss 1997).

Among other things, the workshop participants recommended that either an actual minimum count or the 20th percentile of a log-normal distribution based on the best available population estimate be used as the estimate of minimum population size. They noted the importance of having both reliable and up-to-date population estimates and recommended that calculated PBR levels be reduced by 20 percent per year when the minimum population estimates are more than five years old.

The workshop participants recommended that default values of 0.12 be used for pinnipeds and sea otters and 0.04 be used for cetaceans and manatees when available information is insufficient to estimate their actual maximum net productivity rates (R_{max}). With respect to recovery factors, the participants recommended using different values depending upon the status of the stock (e.g., 0.1 for endangered species and 1.0 for species and stocks well within their

OSP range). In cases where stock discreteness is unknown or uncertain, the participants recommended that the stocks be defined initially based on the smallest unit approaching that of the area of take unless evidence of possible smaller subdivisions exists. With regard to the last point, the participants pointed out that a risk-averse strategy requires that small stock groupings be lumped only when there is a compelling biological reason to do so. Follow-up workshops were held in 1996 and 2003.

Although not without some controversy, the system established by the 1994 MMPA amendments to govern marine mammal/fishery interactions has worked effectively to both regulate the taking of marine mammals incidental to commercial fisheries in U.S. waters and to minimize the impact of the regulations on the affected fisheries.

Development of the Ecosystem Approach to Marine Conservation

In the 1960s trawlers from the former Soviet Union and Japan began exploratory fishing for krill, *Euphausia superba*, in the seas around Antarctica (Sahrhage 1985). This species is a keystone in the Antarctic marine food web. It is the primary food of fin whales (*Balaenoptera physalus*), blue whales (*Balaenoptera musculus*), humpback whales (*Megaptera novaeangliae*), minke whales (*Balaenoptera acutorostrata*), crabeater seals (*Lobodon carcinophagus*), Antarctic fur seals (*Arctocephalus* spp.), chinstrap penguins (*Pygoscelis antarctica*), macaroni penguins (*Eudyptes chrysolophus*), rock hopper penguins (*Eudyptes chrysocome*), several other species of seabirds, and several species of fish and squid. Some of these species are eaten in turn by sperm whales (*Physeter macrocephalus*), killer whales, leopard seals (*Hydrurga leptonyx*), and other higher-order predators (Beddington and May 1982, Hofman 1985).

Knowledgeable scientists expressed concern that, if the fishery grew and was not regulated effectively, it could prevent or impede recovery of depleted stocks of krill-eating whales, as

well as affect the broad range of other species dependent directly and indirectly on krill. In response, the representatives of the Parties to the Antarctic Treaty recommended at the IX Consultative Meeting in London in 1977 that “a definitive regime for the Conservation of Antarctic Marine Living Resources should be concluded before the end of 1978 and that a Special Consultative Meeting should be convened for that purpose” (Antarctic Treaty Recommendation IX-2). Australia offered to host the special meeting, the first session of which was held in Canberra from 27 February to 16 March 1978.

Prior to the 1978 negotiating session in Canberra, several of the Antarctic Treaty Consultative Parties circulated draft conservation regimes for consideration. Each of the drafts had as its central tenet the goal of maximum sustainable yield. During interagency preparations for the negotiations, the Marine Mammal Commission pointed out that consultations and workshops sponsored by the U.S. Council on Environmental Quality and others in 1974 and 1975 had concluded that MSY was an outdated management concept because it failed to consider the possible effects of harvesting on dependent and associated species. The Commission advocated an ecosystem approach as recommended in the report of the consultations and workshops, entitled *New Principles for the Conservation of Wild Living Resources* (Holt and Talbot 1978). Among other things, that report stated that—

The consequences of resource utilization and the implementation of principles of resource conservation are the responsibilities of the parties having jurisdiction over the resource or, in the absence of clear jurisdiction, with those having jurisdiction over the users of the resource. The privilege of utilizing a resource carries with it the obligation to adhere to the following four general principles:

- (1) The ecosystem should be maintained in a desirable state such that—
 - (a) consumptive and non-consumptive values could be maximized on a continuing basis,

- (b) present and future options are ensured, and
 - (c) risk of irreversible change or long-term adverse effects as a result of use is minimized.
- (2) Management decisions should include a safety factor to allow for the fact that knowledge is limited and institutions are imperfect.
 - (3) Measures to conserve a wild living resource should be formulated and applied so as to avoid wasteful use of other resources.
 - (4) Survey or monitoring, analysis, and assessment should precede planned use and accompany actual use of wild living resources. The results should be made available promptly for critical public review.

The Commission's views regarding the necessity of an ecosystem approach were endorsed by the Department of State and included in the U.S. negotiating position for the Canberra meeting. Those views ultimately were incorporated with minor modifications in the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR), which entered into force in 1981. As examples, Articles I and II of the Convention read as follows:

Article I [Scope and definitions]

- (1) This Convention applies to the Antarctic marine living resources of the area south of 60° South latitude [the area to which the Antarctic Treaty applies] and to the Antarctic marine living resources of the area between that latitude and the Antarctic Convergence which forms part of the Antarctic marine ecosystem.
- (2) Antarctic marine living resources means the populations of finfish, mollusks, crustaceans [e.g., krill], and all other species of living organisms, including birds found south of the Antarctic Convergence;
- (3) The Antarctic marine ecosystem means the complex of relationships of Antarctic marine living resources with each other and with their physical environment....

Article II [Objectives]

- (1) The objective of this Convention is the conservation of Antarctic marine living resources.
- (2) For the purpose of this Convention, the term "conservation" includes rational use [e.g., commercial fisheries].
- (3) Any harvesting and associated activities in the area to which this Convention applies shall be conducted in accordance with the provisions of this Convention and with the following principles of conservation:
 - (a) prevention of decrease in the size of any harvested population to levels below those which ensure its stable recruitment. For this purpose its size should not be allowed to fall below a level close to that which ensures the greatest net annual increment;
 - (b) maintenance of the ecological relationships between harvested, dependent and related populations of Antarctic marine living resources and the restoration of depleted populations to the levels defined in subparagraph (a) above; and
 - (c) prevention of changes or minimization of the risk of changes in the marine ecosystem that are not potentially reversible over two or three decades [a human generation], taking into account the state of available knowledge of the direct and indirect impact of harvesting, the effect of the introduction of alien species, the effects of associated activities on the marine ecosystem and the effects of environmental changes, with the aim of making possible the sustained conservation of Antarctic marine living resources.

Many of the details concerning the negotiation of the Convention and actions taken subsequently to implement it are summarized in the Marine Mammal Commission's reports to Congress for calendar years 1978 through 1999. The reports of the meetings of the Commission and Scientific Committee established by the

Convention can be obtained from the headquarters of the Antarctic Commission in Hobart, Tasmania. Hofman (1985, 1993) reviewed the key features of the Convention. The Convention has served as a model for a number of more recent international agreements, including the 1995 FAO Code of Conduct for Responsible Fisheries and the 1995 United Nations Agreement on Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks. Many of the CCAMLR principles are also reflected in the 1991 Protocol to the Antarctic Treaty on Environmental Protection.

Regulation of Commercial Whaling

As noted earlier, the declines and near-extinction of many stocks of large whales due to the failure of the International Whaling Commission (IWC) to effectively regulate commercial whaling was one of the concerns that led to passage of the Marine Mammal Protection Act. That concern was shared by many of the other IWC member countries and led to a 1982 IWC decision to suspend commercial whaling, pending review of the status of the affected whale stocks and assessment of the procedures for setting and ensuring compliance with catch quotas. The suspension was implemented by setting commercial catch limits at zero beginning with the 1986 coastal and the 1985–1986 pelagic whaling seasons (IWC 1983).

The IWC's Scientific Committee subsequently initiated a "comprehensive assessment" of the status and trends of all previously exploited whale stocks (Donovan 1989). In addition, the Scientific Committee evaluated a number of alternative procedures for establishing sustainable catch levels for baleen whales, and in 1991 it recommended to the IWC the adoption of a "revised management procedure" (RMP) to replace the procedure that had been used since 1975 to set catch limits (IWC 1991, 1992). The goal of the RMP is to establish a transparent system for establishing catch limits, with minimum data requirements, that will enable rebuilding of depleted stocks to their

maximum net productivity levels, estimated to be 72 percent of their pre-exploitation sizes, and ultimately to obtain maximum, long-term sustainable yields, assuming that commercial whaling will be resumed. The Commission adopted the recommended RMP with minor modifications in 1995 (IWC 1995).

Although the RMP recommended by the Scientific Committee has been adopted, there remain substantially differing views within the IWC as to whether, and under what conditions, commercial whaling should be resumed. Some members, such as Australia and New Zealand, categorically oppose resumption of commercial whaling largely on ethical grounds. Others, such as Japan, Norway, and Iceland, contend that application of the RMP would effectively eliminate the risk of overexploitation as occurred in the past and that the Commission should lift the suspension on commercial whaling. A major point of contention between those advocating and those opposing resumption of commercial whaling is the system of observation and inspection needed to ensure compliance with authorized catch levels if the suspension were to be lifted. Other points of contention include minimum data standards, progress on development of humane killing methods, the direct and indirect effects of ocean pollution, and the relative economic value and effects on "non-consumptive" whale watching. To date, the pro-whaling nations have been unable to achieve the three-quarters majority needed to lift the suspension.

The International Whaling Convention provides that Commission members may object to, and consequently not be bound by, measures adopted by the three-quarters majority vote of the Commission. Norway objected to the suspension of whaling agreed to in 1982 and is not bound by that measure. Believing that the RMP provides a fully adequate means for preventing overexploitation, Norway has authorized its nationals to take increasing numbers of minke whales in the North Atlantic, using the RMP as a guide for establishing catch limits.

The International Whaling Convention also provides that member countries may authorize their nationals to take unspecified numbers of whales for scientific purposes without the endorsement of the IWC's Scientific Committee or the approval of the Commission. Japan, which initially filed but subsequently withdrew an objection to the 1982 agreement suspending commercial whaling, has since 1987 authorized its nationals to take whales, principally in the Antarctic, for purported "scientific purposes."

Japan also has repeatedly sought IWC authorization to waive the suspension to allow resumption of "subsistence" whaling by its coastal communities, which it asserts depended historically on the take of small numbers of whales for subsistence purposes. Japan's efforts to end the suspension of commercial whaling and to obtain a waiver for the purported subsistence whaling have thus far been unsuccessful. Its authorized taking of whales for purported scientific purposes has generated much controversy (see, for example, Gales et al. 2005).

Gambell (1999) provides an overview of the history of commercial whaling and the ongoing controversy as to whether and under what conditions commercial whaling should be resumed. Currently it is not clear whether the controversy can be resolved—or whether the IWC will survive.

Strandings and Unusual Mortality Events

Marine mammals that strand alive and wash ashore dead provide important sources of information on the distribution, regional abundance, anatomy, physiology, general condition, and diseases of marine mammals. Following a Marine Mammal Commission workshop in 1977 (Geraci and St. Aubin 1979), NMFS fostered the development of regional networks of volunteers to respond to and collect data on both live and dead marine mammal strandings (Wilkinson and Worthy 1999). These volunteer networks have produced a large database on the species, numbers, general condition, and causes

of marine mammal strandings in the United States (Reynolds and Odell 1987, St. Aubin et al. 1996, Geraci et al. 1999). They also have served as a model for establishing stranding response programs in other parts of the world (Geraci and Lounsbury 1993).

The volunteer networks have been instrumental in detecting and investigating the increasing numbers of unusual mortality events, or "die-offs," worldwide (Geraci et al. 1999). These events include the deaths of more than 400 harbor seals in New England between December 1979 and October 1980 due to an avian influenza virus (Geraci et al. 1982); the deaths of hundreds of manatees in Florida due to brevetoxins associated with red tides, which now occur almost annually (Bossart et al. 1998); the deaths of 14 humpback whales in Cape Cod Bay in November 1987 as a consequence of the whales eating mackerel containing saxitoxin, the neurotoxin responsible for paralytic shellfish poisoning (Geraci et al. 1989); the deaths of more than 700 bottlenose dolphins along the U.S. mid-Atlantic coast between June 1987 and January 1988 due to a previously unknown morbillivirus similar to the ones that cause distemper in dogs, measles in humans, and rinderpest in hoofed animals (Geraci 1989, Lipscomb et al. 1994); the deaths of 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 due to morbilliviruses similar to the ones that killed bottlenose dolphins in U.S. waters in 1987–1988 (Osterhaus et al. 1990, Duignan et al. 1992, Aguilar and Raga 1993); the deaths of hundreds of bottlenose dolphins along the Florida panhandle and hundreds of sea lions along the central California coast in 1998 and 1999 associated with toxic algal blooms (Gulland 2000); the deaths of more than 600 gray whales (*Eschrichtius robustus*) along the west coast of North America in 1999 and 2000 due to causes that could not be determined (Gulland et al. 2005); and strandings of dozens of beaked whales (Ziphiidae spp.) in different parts of the world due possibly to

exposure to military sonars (Marine Mammal Commission 2005).

Because of the difficulties encountered in responding to and uncertainties concerning the cause of the dolphin die-off along the mid-Atlantic coast in 1987–1989, Congress in 1992 enacted the Marine Mammal Health and Stranding Response Act as Title IV of the MMPA. Among other things, this legislation directed NMFS to (1) establish an expert working group to provide advice on measures necessary to better detect and respond to unusual mortality events; (2) develop a contingency plan to help ensure prompt and effective response to unusual mortality events; (3) establish a fund to compensate individuals and organizations for certain costs incurred in responding to unusual events; (4) develop objective criteria for determining when rehabilitated, live-stranded marine mammals can be returned to the wild; (5) continue development of the National Marine Mammal Tissue Bank initiated at the National Institute of Standards and Technology following the 1987–1988 bottlenose dolphin die-off; and (6) establish and maintain a central database for tracking and accessing data concerning marine mammal strandings. In response to this directive, NMFS, among other things, has constituted and staffed the expert advisory group and has developed a National Contingency Plan for Response to Unusual Marine Mammal Mortality Events (Wilkinson 1996).

Funding of the regional stranding networks has been a problem and, in December 2000, Congress enacted the Marine Mammal Rescue Assistance Act directing NMFS and FWS to initiate grant programs to improve the effectiveness of the stranding networks. The grants are intended to provide financial assistance for recovery and treatment of live-stranded animals, collection and archiving of data from both live- and dead-stranded animals, and the operational costs directly related to those activities. Grants may be awarded for up to three years with a cumulative total of \$100,000 per eligible participant per year.

Contaminants, Noise, and Other Environmental Threats

As noted earlier, a number of threats to marine mammals and other marine biota were not apparent or widely recognized when the MMPA was enacted in 1972. These include entanglement in lost and discarded fishing gear and other types of marine debris; disturbance and possible injury and mortality associated with loud sounds from human sources; and introduction of increasing amounts and varieties of fertilizers, pesticides, herbicides, pharmaceuticals, and other chemical contaminants into the world's oceans.

Marine Debris Pollution: The marine debris problem is largely a product of the development and use of persistent, non-biologically degradable plastics and other synthetic materials for the manufacture of fishing nets and lines, and packaging materials such as garbage bags and soda and beer six-pack holders (Laist et al. 1999). It was first recognized as a potentially significant marine conservation problem in the late 1970s and early 1980s when northern fur seal (*Callorhinus ursinus*) and Hawaiian monk seal populations were found to be declining coincident with observations of increasing numbers of animals in pupping colonies entangled in bits of fishing net and line and other types of marine debris. Subsequently it was learned that unknown but potentially significant numbers of sea turtles, seabirds, and fishes, as well as marine mammals, were mistaking floating plastic bags, deflated balloons, bits of styrofoam, and other synthetic materials for food items and were dying because the items were indigestible and either clogged their digestive tracts or poisoned them.

Because of the apparent role of entanglement in the decline of fur seals on the Pribilof Islands, the Marine Mammal Commission recommended in 1982 that NMFS convene an international workshop to assess the magnitude and sources of the problem and determine what could be done to address it. The workshop was

held in Honolulu in November 1984 and led to a worldwide effort to document and eliminate the causes of the problem. Details of these and subsequent follow-up actions can be found in the Marine Mammal Commission's annual reports to Congress, beginning in 1981. Additional information can be found on the Web site of The Ocean Conservancy (formerly the Center for Marine Conservation) (www.oceanconservancy.org), which has played a lead role in calling attention to the problem and enlisting the public in efforts to resolve it.

Ocean Noise Pollution: The first indications that human sources of ocean sound might be a problem surfaced in the late 1970s and early 1980s when studies in Alaska and Canada found that the distributions, movements, and behavior patterns of ringed seals (*Phoca hispida*), beluga whales (*Delphinapterus leucas*), and bowhead whales (*Balaena mysticetus*) were affected by sounds associated with offshore oil and gas exploration, sometimes at distances in excess of 10 kilometers (km). Richardson et al. (1995) provided a comprehensive review of these and subsequent studies to assess the effects of anthropogenic sound on marine mammals.

The effects on marine mammal behavior found in those early studies were thought to be biologically insignificant. Consequently, section 101(a)(5)(A) was added to the MMPA in 1981. This addition directed the Secretaries of Commerce and the Interior to authorize, for periods up to five years, the unintentional taking, including the accidental killing, of small numbers of non-depleted marine mammals incidental to activities other than commercial fisheries (which are covered by other provisions of the Act). If the taking involved only small numbers of marine mammals, the impacts on the affected species and stocks would be negligible, and the responsible regulatory agency (NMFS or FWS) would issue regulations specifying when, where, what, why, and how many marine mammals were authorized to be taken. This provision was amended in 1986 to authorize the unintentional taking of small numbers

of depleted as well as non-depleted marine mammal species (for example, endangered bowhead whales when the population-level effects would be negligible and there would be no unmitigable effects on the availability of the affected species or stocks for taking by Alaska Natives for subsistence purposes).

Although the effects of offshore oil and gas development have continued to be the subject of controversy and study, much of the concern and controversy in the past 15 years has been focused on activities conducted or supported by the U.S. Navy. Those activities include (1) the Heard Island Feasibility Study and follow-up Acoustic Thermometry of Ocean Climate Program supported by the Defense Department's Advanced Research Projects Agency; (2) legislatively required shock testing of new classes of Navy surface vessels and submarines under simulated combat conditions; (3) the development and planned use of low-frequency active (LFA) sonar to detect and track new classes of quiet submarines at distances of 200 miles or more in deep offshore waters; (4) the development and testing of additional active sound sources as part of the Littoral Warfare Advanced Development (LWAD) Program to detect and track submarines in shallow coastal waters where neither standard tactical sonars, the LFA sonar, nor passive listening systems can function effectively; and (5) the stranding and deaths of at least 17 cetaceans, including 14 beaked whales, in the northern Bahamas in March 2000 in apparent response to a Navy antisubmarine exercise involving several ships using standard, mid-frequency tactical sonars. Hofman (2004) reviewed these and related actions.

Because of the concern and controversy concerning the possible effects of anthropogenic sound on marine mammals, the National Research Council has conducted four separate studies to assess, identify uncertainties, and suggest means for addressing the problem (National Research Council 1994, 2000, 2003, 2005). Also, Congress in the Omnibus Ap-

appropriations Act of 2003 (Public Law 108-7) directed the Marine Mammal Commission to “fund an international conference or series of conferences to share findings, survey acoustic ‘threats’ to marine mammals, and develop means of reducing those threats while maintaining the oceans as a global highway of international commerce.” In response, the Commission formed an advisory committee, made up of knowledgeable scientists and representatives of the agencies, industry groups, and environmental organizations with related interests, to consider and, as possible, develop consensus views on the critical uncertainties, what would be required to resolve them, and what measures should be taken to minimize possible adverse effects pending resolution of the uncertainties. The results of that effort will be made known to Congress and the public in spring 2007.

Chemical Pollution: The greatest long-term threats to marine mammals, sea turtles, fish, seabirds, and other marine organisms may well be non-point-source ocean contamination (i.e., herbicides, pesticides, fertilizers, road tars, pharmaceuticals, etc. that are carried by rain runoff and sewage into rivers and ultimately into the world’s oceans). Such contaminants have been found in the tissues of marine mammals and other marine organisms from the Arctic to the Antarctic and virtually everywhere in between. Participants in a 1998 workshop convened jointly by the Marine Mammal Commission, the Biological Resources Division of the U.S. Geological Survey, the Environmental Protection Agency, and the National Fish and Wildlife Foundation pointed out that, although there is a growing database concerning the types and levels of contaminants present in the tissues of marine mammals and other marine organisms in many areas, very little is known about the effects of the contaminants, either singularly or collectively, on the growth, longevity, or reproduction of the affected biota (Marine Mammal Commission 1999). To date, however, there has been only limited progress in documenting the sources and effects of

various contaminants and how introduction of harmful contaminants into the world’s oceans can be minimized (cf., O’Shea 1999). These clearly are topics meriting more attention.

Summary and Conclusions

This chapter provides a broad overview of past and current marine mammal conservation issues and several examples of steps that have been and are being taken to address those issues. It points out that conservation must be a dynamic process, taking into account both socioeconomic and biological-ecological factors. It is intended, in part, to call attention to the continuing evolution of conservation laws and policies, both domestically and internationally. It illustrates the interactions and the important roles that the general public, the scientific community, environmental and industry groups, Congress, and the courts play in formulation and implementation of conservation policies and laws in the United States. It also illustrates the important roles that marine mammals, the MMPA, and the Marine Mammal Commission and its Committee of Scientific Advisors have played in instituting the “optimum” concept and the ecosystem approach to marine resource conservation embodied in the MMPA.

Since the MMPA was enacted in 1972, there has been substantial progress in addressing a number of marine mammal and marine ecosystem conservation issues. For example, mortality and serious injury of dolphins in the eastern tropical Pacific tuna purse seine fishery have been reduced dramatically. Commercial whaling currently does not pose a threat to large whales and, if resumed, is likely to be better regulated than in the past. Research and regulatory programs undertaken cooperatively by NMFS and the Alaska Eskimo Whaling Commission have promoted the recovery of the bowhead whale population in the western Arctic, while ensuring the continuing availability of the whales to meet the subsistence needs of Alaska Natives. More manatees exist today in Florida than when the MMPA was enacted.

The eastern Pacific stock of gray whales has recovered to the point that it was removed from the U.S. endangered species list. The optimum concept and the ecosystem approach to marine resource conservation have been incorporated in a number of international agreements, including the Convention for the Conservation of Antarctic Marine Living Resources, the FAO Code of Conduct for Responsible Fisheries, and the United Nations Agreement on Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks. And the PBR and related concepts incorporated in the 1994 MMPA amendments have provided practical solutions to the difficult problems of assessing and monitoring the status of marine mammal stocks in U.S. waters.

Conversely, several issues have resisted solution, and a number of new or previously unrecognized, and sometimes controversial, issues have arisen. Examples include the continuing failure to identify and take steps necessary to facilitate recovery of the highly endangered right whale population in the Northwest Atlantic; the recent declines of sea otters and Steller sea lions in Alaska and the failure to date to determine and eliminate the cause or causes of the declines; uncertainty concerning the cause or causes of the apparent failure of depleted stocks of dolphins in the eastern tropical Pacific to recover now that observed mortality and serious injury associated with the tuna purse seine fishery have been reduced to what should be biologically insignificant levels; the increases in harbor seal and sea lion populations in certain areas and the resulting proposals by some fishermen and fishery managers to cull the populations to limit perceived predation-related impacts on fisheries and fishery resources; the escalating controversy concerning the effects of anthropogenic sound on marine mammals and other marine organisms, and the regulatory measures necessary to avoid or mitigate adverse effects; and uncertainty concerning the direct and indirect effects on marine mammals of climate change, without a

doubt the greatest long-term threat to marine mammals worldwide.

In the opening years of the twenty-first century, it has become clear that litigation often dictates agency priorities and responses to living resource conservation issues here in the United States and in some other countries. This is a consequence of competing interests and values regarding resource use and promotes the inevitable cycle of ineffective and costly crisis management. That is, failure to anticipate resource conservation issues well in advance leads almost inevitably to (a) overutilization and depletion of the resource or uncertainty concerning the effects of ongoing activities; (b) the need to restrict or limit the activity in question to enable recovery of the resource or to resolve the uncertainty concerning its possible adverse effects; (c) actual or perceived socio-economic impacts if the activity is prohibited or restricted; (d) lobbying of Congress and the responsible regulatory agency, and the threat of litigation due to competing and polarized views as to the appropriate course of action; (e) delayed or no action by the responsible regulatory agency leading to further depletion of the resource and/or escalation of the controversy concerning the necessary conservation measures; (f) utilization of limited agency financial and personnel resources to avoid or respond to lobbying and lawsuits, reducing the funding and personnel available for dealing with the actual problem; and (g) often ineffective solutions as a consequence of attempting to satisfy or seek a balance between conflicting interests.

To break this cycle, problems must be anticipated and databases must be developed to identify and evaluate alternative management approaches before crises develop. Toward this end, Congress in 2003 directed the Marine Mammal Commission to undertake consultations with knowledgeable scientists, expressly to identify the most critical long-term research needs regarding marine mammal conservation and the means for proactively meeting those needs. The results of this process (Reeves and

Ragen 2004, Reynolds et al. 2005) should pay huge dividends in the future. The issues judged to be most pressing were the direct and indirect effects of fisheries, environmental contaminants, harmful algal blooms, disease, underwater noise, habitat degradation and destruction, climate change, difficulty identifying optimal management units, and ineffective management strategies.

The future of marine mammal conservation depends on the willingness and ability of governments, government agencies, international organizations, affected industries, and public interest groups to work together to anticipate and find solutions to conservation problems that are both biologically and economically sound.

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Chapter III

REAUTHORIZATION OF THE MARINE MAMMAL PROTECTION ACT

The Marine Mammal Protection Act was enacted in 1972 and has been reauthorized and amended several times since then. The most recent reauthorization of appropriations to carry out the directives of the Act was enacted in 1994 and expired at the end of fiscal year 1999. This does not mean, however, that the provisions of the Act cease to apply or that its mandates necessarily go unfunded. Rather, unless repealed, or allowed to lapse through a sunset clause, the statute remains in force. Similarly, Congress may continue to appropriate funds to implement the Act, as it has done since 1999.

Congress began the process to reauthorize the Marine Mammal Protection Act in 1999. The Subcommittee on Fisheries Conservation, Wildlife, and Oceans of the House Resources Committee held hearings on reauthorization issues in June 1999, October 2001, June 2002, and July and August 2003. The Senate Committee on Commerce, Science, and Transportation held a hearing on reauthorization of the Marine Mammal Protection Act in July 2003. The Commission participated in all of the hearings except the one in August 2003, which was a field hearing convened in San Diego, California, to consider the impacts of increasing pinniped populations on fisheries and recreational activities. Commission testimony presented at the other hearings can be found in the appendices of previous annual reports.

The Administration Bill

The Marine Mammal Commission and the other federal agencies with responsibilities under the Marine Mammal Protection Act entered into interagency discussions beginning in 1999 to identify issues that they believed merited attention during the reauthorization of the Act and to begin to formulate a recommended Administration bill that could be transmitted to Congress for its consideration. Recommended bills were transmitted to Congress in 2000, 2002, 2003, and 2005. Detailed summaries of those proposed bills can be found in previous annual reports. With a new Congress being convened in 2007, the Administration intends to submit a new reauthorization bill for consideration during 2007. Based on discussions

during 2006 among the agencies with primary responsibilities for implementing the Marine Mammal Protection Act, including the Marine Mammal Commission, changes from the earlier Administration reauthorization bills, which were substantively very similar, are possible.

Action in the 109th Congress

Congressman Wayne Gilchrest, then Chairman of the Subcommittee on Fisheries Conservation, Wildlife, and Oceans of the House of Representatives, introduced H.R. 2130, the Marine Mammal Protection Act Amendments of 2005, on 5 May 2005. That bill included several of the amendments that had been proposed by the Administration, as well as other provisions that originated within Congress or that responded to concerns of various constitu-

encies. It was favorably reported by the House Resources Committee on 21 July 2005. Unlike bills that were considered during the previous session of Congress, H.R. 2130 did not incorporate a proposal made jointly by the Administration and the Indigenous Peoples Council for Marine Mammals. That joint proposal would amend the Act to authorize harvest management agreements between the federal resource management agencies and Alaska Native organizations to establish enforceable harvest limits for stocks before they are designated as depleted. Such an amendment has been a central part of the Administration's reauthorization proposals and is an issue that the Commission, other federal agencies, and Alaska Native organizations continue to pursue.

Among the provisions included in H.R. 2130 are proposed amendments to—

- modify the Act's import provision (section 101(a)(6)) to clarify that exports of marine mammal products, as well as imports, are authorized if they are part of cultural exchanges by Alaska Natives and Native inhabitants of Russia, Canada, and Greenland, or if they are for noncommercial purposes by a U.S. citizen in conjunction with travel abroad or by a non-citizen who legally possesses the product;
- expand the incidental take regime for commercial fisheries (section 118) to include recreational fisheries that meet the criteria for listing as a Category I or II fishery;
- increase the time for preparing and reviewing take reduction plans under section 118(f) of the Act and eliminate the need to convene a take reduction team for fisheries that are having no more than a negligible impact on a strategic marine mammal stock;
- retain the zero mortality rate goal of the incidental take regime for commercial fisheries but eliminate the requirement that it be achieved within seven years of enactment of the 1994 Marine Mammal Protection Act amendments;
- require that stock assessment reports and take reduction plans reflect the conservation benefits derived from state and regional fishery management actions;
- require increased representation of National Marine Fisheries Service employees at take reduction team meetings;
- require the Service to consult with a take reduction team before publishing any take reduction plan that differs from that recommended by the team;
- direct the Secretary of Commerce to conduct research on measures for the nonlethal removal and control of nuisance pinnipeds;
- eliminate the requirement that the Marine Mammal Commission be staffed by no fewer than 11 employees and the provision restricting the amount the Commission can spend on experts or consultants;
- extend the exemption for scrimshaw products and materials under the Endangered Species Act for an additional 11 years;
- specifically prohibit the release of a captive marine mammal without prior approval;
- revise the Act's permit provisions to specify that the Secretary may not require, through a comity statement or otherwise, that a marine mammal exported from the United States to a foreign facility remain subject to U.S. jurisdiction;
- exclude marine mammals exported to foreign facilities from the inventory of marine mammals maintained in captivity and specify that the inventory be updated annually;
- direct the National Marine Fisheries Service and the Fish and Wildlife Service to review and report on the costs and benefits of maintaining the inventory of marine mammals maintained in captivity;
- increase the maximum penalties for violations of the Act; and
- reinstate the requirement for the National Marine Fisheries Service and the Fish and Wildlife Service to report to Congress annually on their activities under the Act and

create an annual reporting requirement for federal agencies that conduct or fund marine mammal research.

Although the House Resources Committee had recommended that H.R. 2130 be passed, Congressman Richard W. Pombo, then chairman of the committee, introduced a separate reauthorization bill on 18 October 2005. That bill, H.R. 4075, tracked most of the provisions of H.R. 2130 but included a few technical changes. For example, the reporting requirement for federal agencies that conduct or fund research on marine mammals would be included as a general reporting requirement under section 103 of the Act, rather than being placed in section 110, which pertains specifically to research grants.

The House of Representatives took up consideration of H.R. 4075, renamed the Marine Mammal Protection Act Amendments of 2006, on 17 July 2006. This bill differed from the introduced version in two important ways. First, the bill did not include a proposal to eliminate the seven-year time limit for commercial fisheries to achieve the goal of reducing incidental mortality and serious injury of marine mammals to insignificant levels approaching a zero mortality and serious injury rate under section 118(b) of the Act. Second, the bill was expanded to add a new title to the Act to implement U.S. responsibilities under the Agreement between the government of the United States of America and the government of the Russian Federation on the Conservation and Management of the Alaska-Chukotka Polar Bear Population.

(See further discussion of this agreement and the implementing legislation in Chapter VIII.) The House passed H.R. 4075, as amended, by a voice vote under suspension of its rules.

The Senate also took action on H.R. 4075 but only as a vehicle for passing legislation to implement the United States–Russia polar bear agreement. When the Senate considered the bill on 6 December 2006, all of the amendments other than those pertaining to the polar bear agreement had been stripped, and the polar bear provisions had been modified somewhat from the version passed by the House. The Senate passed that version of the bill by unanimous consent. Inasmuch as agreement had been reached between the Senate and the House on the language of the polar bear provisions, it was expected that the House would be able to pass the Senate version of H.R. 4075 before the end of the congressional session. However, because of scheduling conflicts, this was not possible. Instead, the Senate inserted the polar bear amendments into another bill that it was considering, the Magnuson–Stevens Fishery Conservation and Management Reauthorization Act of 2006. Both the Senate and the House passed this legislation before they adjourned. As such, the polar bear amendments that the Senate had originally passed on 6 December 2006 were signed into law as part of Public Law 109-479. These amendments have been codified as a new Title V to the Marine Mammal Protection Act, 16 U.S.C. §§ 1423-1423h.

Chapter IV

SPECIAL PROJECTS OF THE COMMISSION

From time to time, the Marine Mammal Commission takes on special projects that either Congress or the Commission deems to be particularly critical to the conservation purposes of the Marine Mammal Protection Act. Such projects may involve review and analysis of scientific information, evaluation and development of suitable management measures, the integration of science and management, and the planning of future directions for both. These projects vary in scope but often are directed at key issues with broad application. The Commission focused on three special projects during 2006.

The Effects of Human-Generated Sound on Marine Mammals

The U.S. Congress, through the Omnibus Appropriations Act of 2003, directed the Commission to “fund an international conference or series of conferences to share findings, survey acoustic ‘threats’ to marine mammals, and develop means of reducing those threats while maintaining the oceans as a global highway of international commerce.” The potential for human-generated (anthropogenic) sound to affect marine mammals had been discussed in many fora in recent years and, since 1994, had been the subject of four reports from the National Research Council of the National Academy of Sciences.

In November 2003 the Commission established a 28-member Advisory Committee on Acoustic Impacts on Marine Mammals under the provisions of the Federal Advisory Committee Act of 1972. The advisory committee’s charter directed it to—

- review and evaluate available information on the impacts of human-generated sound on marine mammals, marine mammal populations, and other components of the marine environment;

- identify areas of general scientific agreement and areas of uncertainty or disagreement related to such impacts;
- identify research needs and make recommendations concerning priorities for research to resolve critical uncertainties or disagreements; and
- recommend management actions and strategies to help avoid and mitigate possible adverse effects of anthropogenic sounds on marine mammals and other components of the marine environment.

The Commission selected advisory committee members to balance stakeholder representation. Members were chosen from (a) agencies, organizations, and individuals whose activities introduce sound into the marine environment (the U.S. Navy and other government agencies, shipping and oil and gas industries, and academic research scientists); (b) non-governmental environmental and animal welfare organizations; (c) research scientists with pertinent expertise; and (d) federal and state agencies with responsibilities concerning or affecting marine mammals.

Between February 2004 and September 2005 the Advisory Committee met in six plena-

ry meetings. In addition, Committee members and additional experts participated in numerous subcommittee and working group meetings to develop materials for advisory committee consideration. Operating procedures adopted by the advisory committee included the following primary charge:

The Committee's charge was to develop recommendations to the Commission for inclusion in a report to Congress from the Commission. The Commission asked the Committee to develop as much consensus on these recommendations as was achievable.

At the advisory committee's final meeting in September 2005, significant differences on a number of key issues remained unresolved. Acknowledging this, committee members agreed unanimously not to seek a single consensus report to the Commission. They agreed instead to develop a summary of the advisory committee process and to develop non-consensus statements by individual committee members or groups of members on the issues discussed by the committee in response to its charter. These statements, combined with the summary, were completed in February 2006 and constitute the report of the advisory committee to the Commission. The report is available on the Commission's Web site (www.mmc.gov) or by writing to the Commission offices in Bethesda, Maryland.

At the end of 2006 the Commission was completing work on its report to Congress on the sound issue.

Viability of the Most Endangered Marine Mammals in U.S. Waters and the Cost-Effectiveness of Protection Programs

In its Omnibus Appropriations Act for fiscal year 2004, Congress directed the Marine Mammal Commission to "... review the biological viability of the most endangered marine mammal populations and make recommendations regarding the cost-effectiveness of current protection programs." After consultation with

congressional staff, the Commission focused its review on marine mammals that are listed as either endangered or threatened under the Endangered Species Act or depleted under the Marine Mammal Protection Act and that occur regularly or entirely within U.S. waters (i.e., waters within the U.S. Exclusive Economic Zone around all coastal states and Puerto Rico).

To organize its response, the Commission arranged for four background reports to serve as the basis for a summary report to Congress. The reports included—

- a review of classification systems for ranking wildlife, including marine mammals, by their degree of endangerment and how marine mammal taxa have been listed by those systems;
- a review of the status and costs of protection programs for listed marine mammals;
- an assessment of the state of the science for evaluating the viability of marine mammal species and populations; and
- a case study to evaluate the cost-effectiveness of the North Atlantic right whale recovery program.

The reports will be published in 2007 and are described briefly here.

Review of Species Classification Systems and Listed Species

To identify which marine mammals are the most endangered and in need of greatest protection, the Commission requested a review of three widely recognized classification systems that identify marine mammals in need of special protection and the status of the species listed under them. The three classification systems examined were the List of Endangered and Threatened Wildlife under the Endangered Species Act, the list of depleted species under the Marine Mammal Protection Act, and the International Union for the Conservation of Nature (now IUCN–The World Conservation Union) Red List of Threatened Species.

Twenty-two marine mammal species or populations in U.S. waters were listed under

Table 1. Marine mammals listed as endangered (E) or threatened (T) under the Endangered Species Act or depleted (D) under the Marine Mammal Protection Act, as of 31 December 2006

Common Name	Scientific Name	Status	Range
Manatees and Dugongs			
West Indian manatee	<i>Trichechus manatus</i>	E/D	Caribbean Sea and North Atlantic from southeastern United States to Brazil; Greater Antilles; Bahamas
Amazonian manatee	<i>Trichechus inunguis</i>	E/D	Amazon River basin of South America
West African manatee	<i>Trichechus senegalensis</i>	T/D	West African coast and rivers; Senegal to Angola
Dugong	<i>Dugong dugon</i>	E/D	Northern Indian Ocean from Madagascar to Indonesia (including Red Sea and Arabian Gulf); Philippines; Australia; southern China
Otters			
Marine otter	<i>Lontra felina</i>	E/D	Western South America; Peru to southern Chile
Southern sea otter	<i>Enhydra lutris nereis</i>	T/D	Central California coast
Northern sea otter, Southwest Alaska population	<i>Enhydra lutris kenyoni</i>	T/D	Aleutian Islands to Cook Inlet, Alaska
Seals and Sea Lions			
Caribbean monk seal	<i>Monachus tropicalis</i>	E/D	Caribbean Sea and Bahamas (extinct)
Hawaiian monk seal	<i>Monachus schauinslandi</i>	E/D	Hawaiian Archipelago
Mediterranean monk seal	<i>Monachus monachus</i>	E/D	Mediterranean and Black Seas; northwestern African coast; Madeira
Guadalupe fur seal	<i>Arctocephalus townsendi</i>	T/D	Baja California, Mexico, to Southern California
Northern fur seal	<i>Callorhinus ursinus</i>	D	North Pacific Ocean from California to Japan; Bering Sea
Western Steller sea lion	<i>Eumetopias jubatus</i>	E/D	North Pacific Ocean from Japan to Prince William Sound, Alaska (west of 144° W longitude)
Eastern Steller sea lion	<i>Eumetopias jubatus</i>	T/D	North Pacific Ocean from Japan to Prince William Sound, Alaska (east of 144° W longitude)
Saimaa seal	<i>Phoca hispida saimensis</i>	E/D	Lake Saimaa, Finland
Whales, Porpoises, and Dolphins			
Baiji	<i>Lipotes vexillifer</i>	E/D	Yangtze River, China
Indus river dolphin	<i>Platanista minor</i>	E/D	Indus River, Pakistan
Vaquita	<i>Phocoena sinus</i>	E/D	Northern Gulf of California
Northeastern offshore spotted dolphin	<i>Stenella attenuata attenuata</i>	D	Eastern tropical Pacific Ocean
Coastal spotted dolphin	<i>Stenella attenuata graffmani</i>	D	Eastern tropical Pacific Ocean
Eastern spinner dolphin	<i>Stenella longirostris orientalis</i>	D	Eastern tropical Pacific Ocean
Mid-Atlantic coastal bottlenose dolphin	<i>Tursiops truncatus</i>	D	Atlantic coastal waters from New York to Florida
Cook Inlet beluga whale	<i>Delphinapterus leucas</i>	D	Cook Inlet, Alaska
Northern right whale	<i>Eubalaena glacialis</i>	E/D	North Atlantic and North Pacific Oceans; Bering Sea
Southern right whale	<i>Eubalaena australis</i>	E/D	South Atlantic, South Pacific, Indian, and Southern Oceans
Killer whale, AT1 population	<i>Orcinus orca</i>	D	Prince William Sound; Kenai Fjords, Alaska
Killer whale, southern resident population	<i>Orcinus orca</i>	E/D	Coastal waters from central California to Vancouver Island and the Queen Charlotte Islands
Bowhead whale	<i>Balaena mysticetus</i>	E/D	Arctic Ocean and adjacent seas
Humpback whale	<i>Megaptera novaeangliae</i>	E/D	Oceanic; all oceans
Blue whale	<i>Balaenoptera musculus</i>	E/D	Oceanic; all oceans
Finback or fin whale	<i>Balaenoptera physalus</i>	E/D	Oceanic; all oceans
Sei whale	<i>Balaenoptera borealis</i>	E/D	Oceanic; all oceans
Western gray whale	<i>Eschrichtius robustus</i>	E/D	Western North Pacific Ocean and adjacent seas
Sperm whale	<i>Physeter macrocephalus</i>	E/D	Oceanic; all oceans

Source: U.S. Fish and Wildlife Service regulations at 50 C.F.R. § 17.11 and National Marine Fisheries Service regulations at 50 C.F.R. § 216.15.

the Endangered Species Act or designated as depleted under the Marine Mammal Protection Act at the end of 2006. The three systems were in general agreement.

Under each system, consideration of population units is a critical issue. Most marine mammals listed under the Endangered Species Act (including the precursors to the Endangered Species Act) and IUCN systems were first designated at the species level in the 1960s and 1970s. Since then, information on marine mammal stock structure has increased significantly. Guidance for listing and managing wildlife units below the species level also has changed over time. For example, although the Endangered Species Act has always provided for listing species at the subspecies level, the Act's definition of species was amended in 1978 to include "distinct population segments," and in the mid-1990s the Fish and Wildlife Service and the National Marine Fisheries Service issued a policy statement clarifying how that term was to be interpreted.

Existing information, albeit incomplete in a number of cases, suggests that overall abundance and trends vary greatly among the 22 listed taxa. The Caribbean monk seal (*Monachus tropicalis*) is considered extinct. Five endangered taxa are known or thought to be increasing, three are thought to be declining, and five have unknown trends. Three of the four threatened taxa are known or thought to be increasing and one is declining. Two of the four taxa listed only as depleted—the AT1 group of killer whales (*Orcinus orca*) and Cook Inlet beluga whales (*Delphinapterus leucas*)—are estimated to number 8 and about 300 individuals, respectively, and are declining. The AT1 group of killer whales is probably not biologically viable and is expected to go extinct as existing individuals die. Results of the review suggest that most, but not necessarily all, of the "most endangered" taxa are currently listed under the Endangered Species Act.

Status of Protection Programs for Protected Species

Species that are listed as endangered or threatened under the Endangered Species Act or depleted under the Marine Mammal Protection Act are eligible for special protection under each Act. Among other things, the Endangered Species Act authorizes (1) the preparation of recovery plans to identify and organize needed research and management actions, (2) the designation of recovery teams to assist with recovery work, (3) the designation of critical habitat, (4) requirements that all federal agencies use their authorities to further the purposes of the Act, and (5) requirements that all federal agencies consult with either the Fish and Wildlife Service or the National Marine Fisheries Service (i.e., the lead agencies responsible for marine mammal recovery programs) on any actions they carry out that may jeopardize a species or destroy or adversely modify its critical habitat. For species listed as depleted, the Marine Mammal Protection Act authorizes the preparation of conservation plans, similar to recovery plans, and establishment of take reduction teams to help reduce taking incidental to commercial fisheries. To determine the status of protection efforts under these and other provisions, the Commission contracted for review of information on protection efforts, as well as staff and funding levels, for each of the 22 listed taxa.

The review revealed a high degree of variability in efforts to protect listed taxa. Recovery or conservation plans have been adopted or drafted for 16 of the 22 taxa. Five of the 18 taxa listed as endangered or threatened also have active recovery teams to advise and assist management agencies, and four others are assisted by other types of advisory groups (e.g., take reduction teams and Alaska Native organizations). Seven of the 18 endangered or threatened taxa have designated critical habitat.

Many of the listed taxa face similar threats and conservation issues. They include incidental take in commercial fishing gear, collisions with vessels, entanglement in marine debris, depletion of prey resources, disturbance or harassment by human activities including those that introduce sound into the marine environment, disease, habitat loss, and exposure to naturally occurring biotoxins. In some cases, taxa also face unique threats, such as the entrapment of Florida manatees (*Trichechus manatus*) in floodgates and navigation locks and aggressive behavior by adult male Hawaiian monk seals (*Monachus schauinslandi*) toward pups, juveniles, and some adult females.

Staff and funding levels in support of marine mammal protection programs have generally been poorly documented. Although recovery and conservation plans project funding needs for most recovery programs over a five-year period, total annual expenditures by agencies on specific species are reported only for taxa listed as endangered or threatened, and those totals include no breakdown of actual expenditures according to specific activities. Notwithstanding those limitations, reported funding for species listed under the Endangered Species Act reveal a great disparity in funding levels across protection programs (Figure 1).

Assessing the Population Viability of Endangered Marine Mammals

The first part of the congressional directive asked the Commission to review the biological viability of the most endangered marine mammal populations. To that end, the Commission convened a workshop on 13–15 September 2005 in Savannah, Georgia, to (1) review information on the viability of the most endangered marine mammals, (2) review the status of ongoing modeling efforts, particularly population viability analyses (PVA), for endangered marine mammals, and (3) develop recommendations to improve listing and management decisions based on explicit consideration and improved estimation of population extinction risk.

During the meeting, participants reviewed population models for 9 of the 22 listed taxa. Participants concluded that current PVA models alone were not adequate to rank listed taxa by their risk of extinction or viability. However, considering information on the status of listed taxa from preliminary results of the above-mentioned reviews, participants agreed that, with two or possibly three exceptions, all listed marine mammal taxa, with appropriate management, had the potential for persisting into the future.

The first exception is the Caribbean monk seal, for which there have been no confirmed observations since 1952. Participants in the workshop presumed the species to be extinct. The second exception is the AT1 stock of killer whales. This group of whales numbers fewer than 10 individuals and has not produced a surviving calf for more than 20 years. The group appears unlikely to persist beyond the lifetimes of existing individuals. The third possible exception is the eastern population of the North Pacific right whale. That population has been a matter of concern because of the rarity of sightings, the lack of information on the population, and its history of commercial exploitation. Those concerns, however, are tempered somewhat by recent evidence of successful reproduction (observations of cow-calf pairs).

In addition to those obvious exceptions, participants noted that the stock structure of many marine mammal species is poorly known and some additional populations yet to be identified and not currently listed also may be at risk of extinction now or in the near future.

Noting recent improvement in PVA modeling techniques, workshop participants expressed strong support for increasing the use of PVA models to support listing and management decisions. Participants also considered and expressed support for developing a set of decision rules with relatively simple PVAs for assessing the status of poorly known taxa and guiding the Endangered Species Act listing decisions. The envisioned rules would use available data

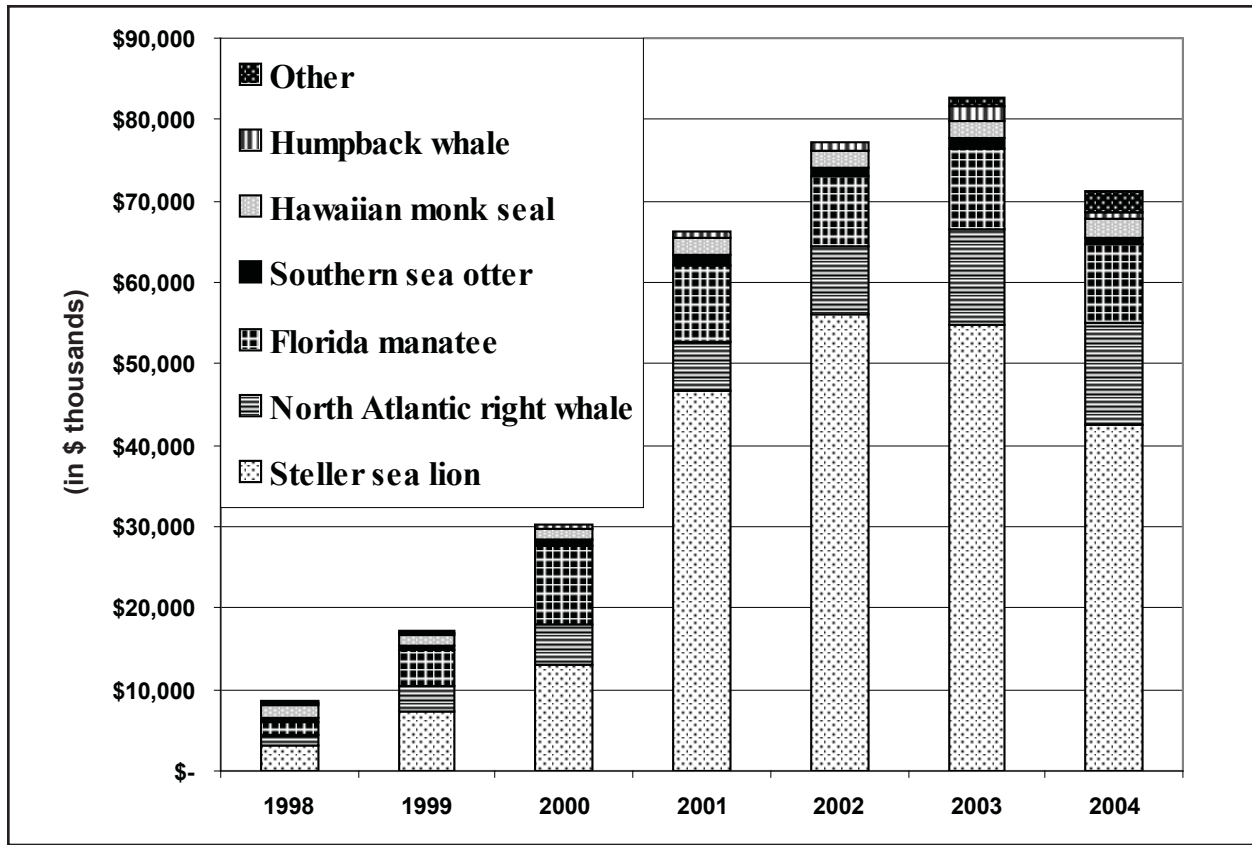


Figure 1. Expenditures (in \$ thousands) for recovery activities on all taxa listed as endangered or threatened, by species and by year, 1998–2004.

on the species of interest; default values where data are lacking; a structured, standardized, and simple analytical framework; and explicit guidelines for interpreting results.

Review of the North Atlantic Right Whale Protection Program

To explore issues of effectiveness and cost-effectiveness in greater detail, the Commission undertook a case study of the recovery program for the North Atlantic right whale (*Eubalaena glacialis*). The right whale program was selected for several reasons, including the high level of congressional interest in recovery work for that species, its high risk of extinction due to human activities, the high level of funding for recovery efforts, and the fact that the recovery plan was revised recently.

To conduct this review, the Commission convened a panel of current and former members

of its Committee of Scientific Advisors who were familiar with the right whale recovery program. In consultation with representatives of the National Marine Fisheries Service, the panel organized a meeting of individuals directly involved in recovery work for this species. The review, held on 13–17 March 2006 in Woods Hole, Massachusetts, examined major research activities as well as management actions to reduce the two main sources of human-related right whale deaths: collisions with ships and entanglement in commercial fishing gear (see also Chapter VI).

The panel concluded that, although valuable information had been acquired and funding had been directed toward these issues, management measures to protect North Atlantic right whales have not been effective in eliminating ship strikes and entanglement in fishing gear.

With regard to entanglements, the cost-effectiveness of some key measures taken to date, such as incorporating “weak links” in lobster and crab trap lines, and the current take reduction team process (see also North Atlantic right whale in Chapter VI), seems doubtful. Other more promising approaches are being pursued too slowly (e.g., use of sinking line for ground lines in trap fisheries), are receiving too little investment (e.g., technology to eliminate buoy lines), or are underused (e.g., area closures). Management efforts to date to prevent ship strikes (e.g., requests and support for voluntary action by mariners to avoid hitting right whales) appear to have had little, if any, effect. However, proposed speed restrictions and creation of traffic corridors (also discussed in Chapter VI) are promising and potentially cost-effective.

As a general matter, the panel concluded that, for a species as endangered as the North Atlantic right whale, cost-effectiveness would be improved if stringent, science-based management actions were applied broadly to ensure adequate protection and then were more finely tuned—and where possible scaled back—as understanding improved and better options became available. Such an approach was seen as preferable to the process of incremental regulatory expansion that has been pursued over the past 15 years. The approach proposed by the panel seems essential given the social and economic expectations of an ever-expanding level of human activity with which the whale population must coexist.

With regard to research activities, the panel concluded that funding had been allocated and spent in a cost-effective manner. The panel recommended that—

- a one-time funding supplement be provided to cover the costs of clearing the data backlog and integrating genotype information into the right whale identification catalog;
 - sighting data gathered since the early 1990s be analyzed to determine whether and how the existing critical habitat boundaries should be changed to better reflect right whale distribution;
 - assessments of population size and trend be completed annually to help assess the effectiveness of management actions and measure progress toward recovery; and
 - the Service proceed with its planned transition away from aerial surveys to monitor population occurrence and movements and toward passive acoustic monitoring, but that this transition be gradual and with due regard for the need to collect photo-identification data, particularly in the southeastern U.S. calving ground and the Great South Channel feeding ground off Massachusetts.
- With regard to management actions to reduce collisions with ships, the panel concluded that efforts to date, based largely on outreach, have not been effective. Recognizing the need for stronger measures, the Service has been developing and evaluating a new initiative since the late 1990s. Major new options under the new ship strike strategy include proposed regulations to limit vessel speed during times and in areas where right whales are likely to occur, and measures to direct vessel routing through key right whale habitats. Regarding other efforts to reduce ship collisions, the panel recommended that:
- vessel speed restrictions be set at 10 knots;
 - if delays in the rulemaking process extend the effective date of speed regulations beyond early 2007, emergency rules be issued promptly;
 - vessel operators and port pilots be consulted to determine the most effective way to communicate right whale advice and information;
 - evaluations be undertaken to determine which outreach methods are most effective in getting vessel operators to adopt recommended precautions;
 - in view of the expense and poor results of studies conducted to date on sonar detection and alarm systems to prevent collisions, support for similar studies be suspended;
 - further research on passive acoustic systems to detect the presence of whales in vessel traf-

- further studies be undertaken to assess the behavior of whales in response to ship traffic.

The Service's approach to the entanglement issue has been to gradually expand the requirements for modifying fishing gear that may be less likely to entangle whales and to disentangle whales found entangled. Despite a decade-long period of development, the exceedingly complex suite of regulations now in place to require gear modifications has not reduced the observed occurrence of right whale entanglements in fishing gear, and there is evidence that some required modifications (e.g., weak links to prevent entanglements in buoy lines) are of limited usefulness at best. Therefore, in 2003 the Service initiated a new rulemaking process to further expand gear modification requirements (see North Atlantic right whale in Chapter VI). As part of that process, the Service has reconvened the Atlantic Large Whale Take Reduction Team periodically since 1996 to seek advice on needed measures. Based on advice from the team and its own analyses, the Service has proposed a new set of measures that, like those previously implemented, rely almost exclusively on gear modifications.

Because all currently proposed options for revising take reduction measures rely on weak links to prevent entanglement in buoy lines, the panel found it difficult to imagine any scenario in which the proposed modifications would meet established take reduction goals or even significantly reduce the frequency of right whale entanglements. As an alternative approach, the panel recommended that fisheries using fixed gear in areas where right whale aggregations occur be required to demonstrate that gear is whale-safe before it is approved. To move in that direction, the panel recommended that regulations be developed and implemented as quickly as possible to prohibit the use of vertical lines and require the use of sinking or neutrally buoyant ground lines in important right whale habitats (e.g., designated critical habitats, seasonal area management zones, and

dynamic area management zones) when whales are likely to be present. In this way, fishermen would be stimulated to use their considerable creative ability to develop ways of catching lobsters and finfish without depending on methods that risk whale entanglement. The panel also recommended that the boundaries of designated critical habitat be reexamined in light of right whale sighting data amassed since the early 1990s when those areas were initially designated.

The panel also noted that the Atlantic Large Whale Take Reduction Team had consistently failed to reach consensus on most key issues and usually only offered the Service its differing opinions on needed measures. Therefore, the panel concluded that the take reduction team had been neither effective or cost-effective as a mechanism for developing mitigation strategies. In the panel's view, statutory provisions authorizing take reduction teams did not envision such a prolonged, open-ended process for reducing incidental taking in commercial fisheries. Therefore, it recommended that the Atlantic Large Whale Take Reduction Team be replaced by a less costly scientific advisory body, such as a small recovery team consisting of individuals with direct knowledge of right whale biology and whale entanglement issues.

With regard to disentanglement work, the panel was impressed by the commitment of the people who, at great personal risk, remove gear from whales. It noted that disentanglement efforts have almost certainly saved the lives of at least some animals. However, only a small fraction of entangled right whales are successfully disentangled, and disentanglement efforts do nothing to address the underlying cause of the problem. The panel concluded that this work should continue, nevertheless, given that a modest amount of success has been achieved. Recognizing the risks faced by disentanglement personnel and the limited chance of success in dealing with complex entanglements, the panel recommended that a risk/benefit analysis be carried out to provide

guidance on how to weigh human safety risks against the likelihood of successful outcomes. It concluded that the costs of disentanglement should be borne by the program or programs authorizing the fisheries that are involved (e.g., programs to implement fishery management plans), rather than by the right whale recovery program. Finally, the panel cited the need for better methods to chemically sedate entangled whales, improved means of attaching telemetry systems to track the animals, and more trained individuals to lead disentanglement teams.

Report to Congress

At the end of 2006 the Commission was preparing the reports and reviews resulting from this project for publication. Based on their findings, the Commission has begun preparing a summary analysis and report that would constitute its response to the congressional directive. That report, along with the four background reports, is expected to be provided to Congress in 2007 and will present the Commission's recommendations for improving the cost-effectiveness of protection programs for the most endangered marine mammal populations in U.S. waters.

The Role of Killer Whales in North Pacific Ecosystems

In its fiscal year 2004 appropriations bill, Congress also directed the Marine Mammal Commission to “review available evidence regarding the theory that rogue packs of killer whales are wiping out discrete populations of the most endangered marine mammals.” A number of marine mammal populations in the North Pacific Ocean and Bering Sea have declined significantly over the past three or four decades. As a result of the observed declines, the western population of Steller sea lions (*Eumetopias jubatus*) has been listed as endangered, the Southwest Alaska population of northern sea otters (*Enhydra lutris kenyoni*) as threatened, and the Pribilof Islands population of northern fur seals (*Callorhinus ursinus*) as

depleted. These changes in legal status have potentially significant management implications and have received considerable attention due to the constraints—or the possibility of constraints—imposed on fishing and other human activities. Three factors have been identified as potentially important causes of the declines: oceanographic regime shifts, commercial fishing, and predation by killer whales.

When Congress issued its directive in 2004, scientists had proposed two hypotheses implicating killer whale predation as a primary cause of the pinniped and/or sea otter declines. The first was that pinnipeds in the Aleutian Islands region declined due to diminished prey resources and, as a result, killer whales that had preyed upon pinnipeds switched to sea otters, causing their numbers to decline. The second was that large-scale commercial whaling in the North Pacific Ocean and Bering Sea from the 1950s to 1970s substantially reduced the availability of prey for killer whales, causing them to shift their foraging, first from large cetaceans to pinnipeds (harbor seals, fur seals, and Steller sea lions, in that order) and then to sea otters. Other scientists noted that killer whales commonly scavenged the carcasses of whales killed by commercial whalers and hypothesized that scavenging killer whales increased in number during the peak of whaling. They further hypothesized that the decline in available whale carcasses at the end of commercial whaling caused those killer whales to shift to other prey, although they did not comment on the extent to which such a shift in killer whale predation may have contributed to the pinniped and sea otter declines.

Yet other scientists argued against the hypothesis that commercial whaling had initiated a sequence of changes resulting in the pinniped and sea otter declines, suggesting that the observed declines were caused by a combination of factors, including nutritional stress, legal and illegal shooting, bycatch in commercial fisheries, and predation. They also hypothesized that the increasing population of eastern gray

whales (*Eschrichtius robustus*) may have resulted in an increase in killer whales foraging on gray whale calves along the migration route, particularly around key passes in the Aleutian Islands chain, and that those killer whales then shift to preying upon pinnipeds or sea otters when gray whales migrate out of the area. Still other scientists suggested that the declines were caused by a combination of factors and hypothesized that killer whale predation contributed to the declines only when pinniped and sea otter populations had already declined to relatively small sizes. The contrasting hypothesis was that declining populations of pinnipeds and sea otters caused killer whales to switch to preying on large whales, resulting in an increase in the number of observed attacks on large whales. Although these hypotheses focus primarily on the effects of killer whale predation on their prey, killer whales themselves, as apex predators, may have been affected by changes in their prey base in the Bering Sea and North Pacific.

To investigate the potential effects of killer whale predation on marine mammals, the Commission convened a workshop of killer whale experts in April 2005 to review available information on killer whales and their role as predators, identify crucial gaps in that information, and suggest research to fill those gaps. Key areas of discussion included killer whale ecotype and stock structure; abundance and trends; broadscale and fine-scale distribution and movement, foraging patterns and diet, nutritional needs and energetics; and pertinent information on potential prey. Workshop participants agreed that mammal-eating (so-called “transient”) killer whales had the potential to significantly affect local populations of their prey, but available information was insufficient to indicate whether killer whales were involved in the decline of pinniped or sea otter populations or in delaying the recovery of those populations. Essentially, no direct evidence is available to prove retrospectively that killer whales were or were not a significant contributing factor in the declines in pinnipeds and



Figure 2. A pod of transient killer whales off Island View Beach, Vancouver, British Columbia. Photograph by RobinW. Baird.

sea otters. Workshop attendees recommended research organized around the following principal questions to investigate the role of killer whale predation on other marine mammals:

- How many transient killer whales are in the North Pacific?
- What are their distribution and movement patterns?
- What marine mammals do they eat?
- How much do they eat?
- How does transient killer whale predation affect prey populations?

Although information is available to address some aspects of these questions (i.e., for specific regions and seasons), that information is not sufficient to answer any of the questions in full. Based on the findings of the first workshop, the Marine Mammal Commission drafted a comprehensive research plan intended to guide future integrated research to address the fundamental questions and provide a valid basis for assessing the predator-prey dynamics of transient killer whales and their marine mammal prey. This plan will be included as part of the Commission’s report to Congress.

To encourage implementation of the research plan, the Marine Mammal Commission convened a second workshop in August 2005 to bring together killer whale experts from the first workshop and representatives of agencies and organizations that were likely

to fund research of the type described in the plan. Workshop participants discussed the research plan and provided suggestions for developing an implementation strategy similar to that used to implement the international collaborative research program on humpback whales in the North Pacific Ocean known as SPLASH (Structure of Populations, Levels of Abundance, and Status of Humpback Whales). In December 2005 the Commission convened a

small committee of killer whale researchers to coordinate the further development of research implementation and funding efforts. The success of the implementation effort will depend to some degree on support and funding from Congress and non-governmental conservation organizations for long-term ecological research on killer whales and the ecosystems to which they belong.

Chapter V

ARCTIC MARINE MAMMALS AND CLIMATE CHANGE

Eight marine mammal species occur primarily or entirely in Arctic regions. They are the bowhead whale (*Balaena mysticetus*), beluga whale (*Delphinapterus leucas*), bearded seal (*Erignathus barbatus*), ribbon seal (*Phoca fasciata*), ringed seal (*Phoca hispida*), spotted seal (*Phoca largha*), walrus (*Odobenus rosmarus*), and polar bear (*Ursus maritimus*). A number of other marine mammal species occur seasonally in the Arctic. Little research has been directed at most of these species, and a review of the 2006 stock assessment reports compiled by the National Marine Fisheries Service and the Fish and Wildlife Service indicates that abundance estimates are available for only three Arctic stocks: Beaufort Sea beluga whales, western Arctic bowhead whales, and southern Beaufort Sea polar bears (Table 2). Abundances are not known for the other seven stocks (including eastern Chukchi Sea beluga whales and Chukchi/Bering Sea polar bears).

The Marine Mammal Commission has recommended repeatedly that stock assessment efforts be enhanced for Arctic marine mammals, particularly the ice-associated seals, to provide information adequate to evaluate their status and trends and their vulnerability to various threats. That information is essential for assessing the impact of climate change and its secondary effects in the Arctic. Such changes are already occurring. Air temperatures are increasing over much of the Arctic, and summer sea ice has decreased by 30 percent over the past three decades. Projections vary in the expected rate of change but suggest the Arctic may be completely ice free in summer months by 2050 to 2100. In addition, human activity (such as oil and gas production, mining, marine transport, commercial fishing, and tourism) in the Arctic is expected to increase as a consequence of warmer temperatures and longer open-water seasons. With increased human activity comes increased risk of deleterious anthropogenic effects on ecosystems although such effects might be mitigated if addressed proactively.

Since its inception in 1974 the Commission has funded more than 30 research projects focusing specifically on Arctic species or issues. One-third of those projects have been funded since 2000. In addition to supporting individual research projects, the Commission also has engaged in a series of related efforts to address specific concerns regarding climate change and its effects on Arctic marine mammals.

Sea Ice Workshop

In 2000 the Commission sponsored a workshop on Impacts of Changes in Sea Ice and Other Environmental Parameters in the Arctic. The workshop brought Alaska Natives with traditional ecological knowledge together with scientists from a variety of disciplines. The workshop goals were to (1) review how changes in sea ice and other environmental parameters may be affecting Arctic living resources and the indigenous cultures and practices that depend on those resources, (2) identify measures that might be taken to mitigate the impacts of realized and anticipated changes, and (3) develop a

blueprint for action by legislators, conservationists, Arctic residents, and others. The combination of multidisciplinary science and traditional knowledge made a strong and urgent case for addressing environmental changes in the Arctic. A report of that workshop is available on the Commission's Web site at www.mmc.gov/reports/workshop/seaice.html.

One of the recommendations resulting from the sea ice workshop was to record traditional knowledge of Alaska Natives regarding the Arctic climate and incorporate that knowledge into scientific research and management decisions. In response, the Commission funded a project to record the traditional knowledge of subsistence hunters from two Yupik communities on St. Lawrence Island, Alaska. The project resulted in a book entitled *Watching Ice and Weather Our Way*, published in 2004 and coauthored by Yupik elders and scientists. Its four sections include (1) a Yupik sea ice "dictionary," an illustrated list of almost 100 Yupik terms for sea ice formations prepared by a respected elder; (2) 2000–2001 observations of sea ice by two respected elders; (3) knowledge of ice and weather taken from stories told at elders conferences, personal narratives, and interviews; and (4) historical records of sea ice and weather conditions off St. Lawrence Island with comments by today's elders.

Potential Effects of Climate Change on Arctic Marine Mammals

In 2004 the Commission funded a project to predict the likely effects of climate change on Arctic marine mammals. That ongoing project seeks to (1) review available Arctic climate change scenarios to identify regional changes in important habitat parameters for Arctic marine mammals; (2) assess how climate change, alone or in combination with other factors such as commercial shipping and offshore development, is likely to affect the abundance, distribution, behavior, body condition (or health status),

and population viability of Arctic marine mammals; (3) assess how changes to Arctic marine mammal populations may affect people who rely on them for subsistence; (4) evaluate the overall implications of climate change in the Arctic for the conservation and management of marine mammals; and (5) develop recommendations for actions to address identified conservation threats.

In advance of the workshop, scientific experts from a variety of disciplines were selected to prepare articles on these topics for publication in a special issue of *Ecological Applications*. Most of the analysis and drafting occurred during 2004–2006, and the special issue is to be published early in 2008. The articles will include a description of the current understanding of climate change and model predictions for the coming century, and several articles will use those model predictions as the basis for further analysis. Those articles will analyze the likely effects of climate change on marine mammal prey (including broader effects on benthic vs. pelagic productivity and food web dynamics), marine mammal habitats, and marine mammal body condition and health. Additional articles will evaluate likely changes in human activities in the Arctic and the likely effects of those activities on marine mammals and subsistence hunters who rely on marine mammals, and the broader context of arctic marine mammal adaptation to climate change in the light of evolutionary history, zooarchaeology, and molecular genetics. Finally, two synthesis articles will assess overall impacts of climate change on marine mammals, resilience of marine mammals to those impacts, and potential management strategies to conserve marine mammals in the face of climate change.

Development of Monitoring Strategies for Arctic Marine Mammals

In 2006 the Commission, in cooperation with the Fish and Wildlife Service, provided

funds to convene a workshop to develop monitoring plans for two Arctic marine mammal species, the ringed seal and the beluga whale. These species were selected for a variety of reasons including their circumpolar distribution, the availability of historic and recent data on their status in at least some regions, and their importance to indigenous communities. The intent of the workshop was to bring together experts from Arctic nations and Arctic indigenous communities to review ringed seal and beluga whale biology and ecology, Arctic ecosystem dynamics, Arctic oceanography and climate, sea ice, marine mammal health, sub-

sistence harvest and biosampling networks, and monitoring techniques. The workshop results will be compiled and used to develop cohesive and comprehensive monitoring plans for ringed seals and beluga whales. Those plans will be distributed to relevant resource management agencies in the Arctic nations to inform their monitoring efforts and promote international collaboration in monitoring shared species. The plans also could serve as mechanisms for attracting, prioritizing, and coordinating long-term funding for monitoring needs. The workshop is scheduled for 4–6 March 2007.

Table 2. Listing status and approximate abundance of Arctic marine mammal stocks

STOCK	STATUS	ABUNDANCE ¹
Eastern Chukchi beluga whale	Not listed	Unknown ²
Beaufort Sea beluga whale	Not listed	39,258
Western Arctic bowhead whale	Endangered	10,545
Bearded seal	Not listed	Unknown
Ribbon seal	Not listed	Unknown
Ringed seal	Not listed	Unknown
Spotted seal	Not listed	Unknown
Walrus	Not listed	Unknown
Chukchi-Bering Seas polar bear	Not listed ³	Unknown
Southern Beaufort Sea polar bear	Not listed ³	2,272

¹ Data courtesy of National Marine Fisheries Service stock assessment reports for 2006.

² The National Marine Fisheries Service's 2006 stock assessment report estimates abundance at 3,710, but this is based on surveys carried out in 1989–1991.

³ At the end of 2006 the Fish and Wildlife Service was considering a petition to list the polar bear as threatened under the Endangered Species Act.

Chapter VI

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 Departments of Commerce and the Interior and other federal agencies regarding research and management actions needed to conserve species and stocks of marine mammals.

To meet this charge, the Commission devotes special attention to particular species and populations that are vulnerable to the impact of human-related activities. Such species may include marine mammals listed as endangered or threatened under the Endangered Species Act or as depleted under the Marine Mammal Protection Act (Table VI-1). In addition, the Commission often directs attention to other species or populations of marine mammals not so listed whenever special conservation challenges arise that may affect them.

During 2006 special attention was directed to a number of endangered, threatened, or depleted species or populations, including the Cook Inlet, Alaska, stock of beluga whales; the North Atlantic and North Pacific right whales; the southern resident population of killer whales off the state of Washington; the Southwest Alaska stock of northern sea otters; the Steller sea lion; the Hawaiian monk seal; and the Florida manatee. Attention was also focused on the polar bear, which has been proposed for threatened status by the Department of the Interior.

In addition to the species mentioned here, many marine mammal species and populations in other areas of the world face major conservation challenges. The Marine Mammal Protection Act recognizes those species and the value of conserving them. Limited funding and personnel have, in many cases, constrained the Commission's efforts to promote their conservation. Although the Commission has not been involved in oversight or management of many such species and populations, several are dis-

cussed briefly in this chapter to increase society's awareness of their plight and to encourage greater efforts to protect and conserve them.

Polar Bear *(Ursus maritimus)*

The polar bear, perhaps the quintessential symbol of the Arctic, is the largest member of the genus *Ursus*. The species is distributed throughout the circumpolar Arctic in 19 populations totaling approximately 20,000 to 25,000 bears. Polar bears evolved to exploit the arctic sea ice niche and are found wherever sea ice is present for a substantial part of the year. However, in recent years, global warming has led to a rapid decrease in the extent of sea ice habitat on which polar bears rely. This phenomenon, coupled with other threats, has raised serious concerns about the fate of polar bears, dependent as they are on sea ice habitat and healthy populations of ice seals for prey. Polar bear stocks appear to be declining worldwide and, at its 2005 meeting, the Polar Bear Special-

ist Group of IUCN–The World Conservation Union recommended that the species' status be elevated from "low risk" to "vulnerable" based on the likelihood of an overall decline in the size of the total population of more than 30 percent within the next 35 to 50 years.

Two populations of polar bears are found within the jurisdiction of the United States. The southern Beaufort Sea stock numbers about 2,200 animals and is shared with Canada. Recent evidence indicates that animals are showing signs of stress due to the retreat of ice in summer. The Chukchi/Bering Seas stock, estimated at 2,000 animals, is shared with Russia. Little information is available on the status of the Chukchi/Bering Seas stock, but anecdotal evidence suggests that unregulated harvest by Russian Natives on the Chukotka peninsula, coupled with legal subsistence hunting in Alaska, may have reached unsustainable levels.

The most serious conservation issues facing polar bear populations are the potential effects of climate change and contaminants; the potential overharvest of bears, especially in Russia; and the impact of human development on polar bear habitat. The potential effects of climate change, particularly in the Arctic, are discussed generally in Chapter V. The taking of polar bears by sport hunters in Canada and importation of trophies into the United States and possible changes to the authorized stocks are discussed in Chapter IX. Chapter IX also provides a summary of small-take authorizations that were issued in 2006 to allow the taking of polar bears incidental to oil and gas operations in Alaska.

Research programs involving polar bears were reviewed at the Commission's 2005 annual meeting and summarized in the previous annual report. These research activities include (1) a biomonitoring program in which samples are made available for contaminant analysis, genetic analysis, food habitat studies, the assessment of physiological parameters, and long-term studies requiring the archiving of specimens; (2) aerial surveys to determine

polar bear distribution and abundance; (3) a feeding ecology study; and (4) a study of polar bear–human interactions.

Proposal to List Polar Bears under the Endangered Species Act

On 16 February 2005 the Center for Biological Diversity petitioned the Secretary of the Interior to list the polar bear as a threatened species under the Endangered Species Act. The petition contended that the polar bear "faces likely global extinction in the wild by the end of this century as a result of global warming." Citing a recent report by the Arctic Climate Impact Assessment, the petition also suggested that average annual temperatures in the Arctic likely will rise more than 7°C and summer sea ice coverage will decline by more than 50 percent and possibly disappear completely. The petition contended that even the partial loss of sea ice has the potential to drive the polar bear to extinction within the foreseeable future. In addition to the effects of global warming, the petition noted that polar bears face threats from increasing oil and gas exploration and development in the Arctic and the associated risk of oil spills, high levels of contaminants such as polychlorinated biphenyls (PCBs) and heavy metals, unsustainable levels of hunting in some areas, and a general increase in human activities in the Arctic.

The petition also noted that some of these adverse effects are already manifesting themselves in at least one polar bear population, that in Canada's western Hudson Bay. The breakup of ice in western Hudson Bay is occurring about two and a half weeks earlier than it did 30 years ago. This translates into less time available for the bears to hunt seals, so the bears in that area are noticeably thinner and are experiencing lower reproductive rates and higher juvenile and subadult mortality.

Under provisions of the Endangered Species Act, the Fish and Wildlife Service is required to make a determination within 90 days of receiving a listing petition as to whether the petition presents substantial information that the listing

may be warranted. If an affirmative finding is made, the Service must initiate a review of the species' status and, within 12 months of receipt of the petition, publish either (1) a finding that listing is not warranted, (2) a proposed rule to list the species, or (3) a finding that listing is warranted but precluded by other pending listing proposals.

The Fish and Wildlife Service published a finding on 9 February 2006 that the petition presented sufficient information to initiate a thorough status assessment of polar bears worldwide. The Endangered Species Act defines an "endangered species" as any species in danger of extinction throughout all or a significant portion of its range. A "threatened species" is defined as any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act specifies that a status assessment and subsequent listing determination be based on the following five factors: (1) present or threatened destruction, modification, or curtailment of habitat or range; (2) over-utilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; and (5) other natural or anthropogenic factors affecting the species' continued existence.

The Endangered Species Act does not define the term "foreseeable future," so one of the key determinations that the Service needed to make in determining whether polar bears should be listed as threatened is what time frame to use in its assessment. The IUCN/Polar Bear Specialist Group, which had examined the status of polar bears in June 2005, had applied three generations as the appropriate time span for its projections. Generations, as defined by the IUCN, are calculated as the age of sexual maturity (5 years for polar bears) plus 50 percent of the length of the lifetime reproductive period (20 years for polar bears). Based on these determinations, the Polar Bear Specialist Group calculated the period of one generation as 15 years and the period for three generations as 45

years. Given the IUCN criteria, the life history and population dynamics of polar bears, documented changes to date in both multi-year and annual sea ice, and the direction of projected rates of change of sea ice in future decades, the Fish and Wildlife Service considered the three-generation, 45-year time span to be a reasonable projection of the foreseeable future in analyzing whether polar bears merited listing under the Endangered Species Act.

Recognizing the role the Marine Mammal Commission plays in recommending the listing of marine mammal species under the Endangered Species Act or in designating them as depleted under the Marine Mammal Protection Act, the Service sought peer-review comments in a formal structure from the Commission on a draft of the assessment. The Commission's comments were posted on the Service's Web page at <http://alaska.fws.gov/fisheries/mmm/polarbear/issues.htm> and are part of the formal process under the Endangered Species Act. In its comments, the Commission noted that the draft assessment provided a comprehensive summary of information on the species but that a more directed, concise analysis that focused on the Endangered Species Act listing criteria was needed. The Commission provided several drafting suggestions and recommended that the assessment be restructured to highlight four areas: the biology and ecology of polar bears, the status and trends of the various populations, the present and future threats to the species, and a mechanism for determining the significance of those threats. The Commission believed that some areas had been well covered, but that more attention needed to be paid to compiling information on potential threats and, particularly, in assessing the risks that those threats posed to the affected populations. The Commission suggested, for example, that the Service engage in population modeling to define the amount of change in various population parameters needed to cause negative population-level effects that would lead to extinction over a defined period of time.

The Commission also indicated that the 45-year period being used by the Service in its analyses was too short. The Commission believed that a time frame of 100 to 120 years was more appropriate, in part because it would conform to the durations over which sea ice persistence is modeled and would be consistent with the time frames used in risk analyses for other marine mammal species such as large whales, beluga whales, and manatees.

The Service published its status review of polar bears on 21 December 2006. A copy of the review is available on the Service's Web site at http://alaska.fws.gov/fisheries/mmm/polar-bear/pdf/Polar_Bear_%20Status_Assessment.pdf. The Service adopted some, but not all, of the suggestions made by the Commission. Among other things, the Service retained the three-generation time span in its assessments.

On 27 December 2006 the Secretary of the Interior held a press conference to announce that the Department intended to propose listing all populations of polar bears as threatened under the Endangered Species Act. The Secretary explained that "while the proposal to list the species as threatened cites the threat of receding sea ice, it does not include a scientific analysis of the causes of climate change. That analysis is beyond the scope of the Endangered Species Act review process, which focuses on information about the polar bear and its habitat conditions including reducing ice." The Secretary also indicated that oil and gas development and subsistence hunting were found by the agency not to be threats to the polar bear; only the melting of sea ice had been determined to be a relevant threat. Although the Secretary acknowledged that Arctic ice melting was due to global warming and that the Administration sees a link between climate change and greenhouse gases, he noted that the regulation of greenhouse gases was beyond the scope of the Endangered Species Act.

The Fish and Wildlife Service expected to publish a proposed rule in 2007 to list polar bear populations rangewide as threatened.

Native Subsistence Hunting

The Marine Mammal Protection Act authorizes Alaska Natives to take marine mammals for subsistence uses and for purposes of making and selling authentic Native articles of handicrafts and clothing. Subsistence hunters in Alaska take polar bears from both stocks that occur in Alaska (see Table 3). The Fish and Wildlife Service's marking and tagging program has provided data on the numbers of polar bears taken since 1988, the year that program was instituted. Under the program, Alaska Native hunters are required to report each polar bear taken within 30 days of the hunt and present the skin and skull of the animal for tagging. The Service has established a network of "taggers" located in each of the hunting villages who tag the bear parts and collect information on the size, sex, and approximate age of the bear and the location where it was taken.

The number of bears taken in Alaska from the Chukchi-Bering Sea stock has declined since the 1980s. The average annual take of bears in the 1980s was 92. This fell to about 50 a year during the 1990s and has dropped to about 43 a year since 2000. The causes for this decline are not well understood, but it may be related to changing climate conditions and the altered duration, extent, movement, and thickness of the sea ice in the area, or may reflect a possible population decline. Another factor possibly having an impact on the availability of polar bears to subsistence hunters in Alaska is the suspected, but unquantified, increase in the number of bears being taken from this population in Russia. The decline in the number of bears being harvested from this population also might be due in part to a decline in the number of active hunters in the Native hunting villages. In contrast to the Chukchi-Bering Sea population, the average number of polar bears taken from the southern Beaufort Sea stock has remained relatively constant since 1980 at about 36 bears a year (Table 3).

Since 1994 the marking and tagging program has collected information as to whether polar bears reported by Alaska Natives were taken as part of traditional subsistence hunts or were taken in defense of life or property. Although the number of polar bears taken in defense of life or property varies considerably among years, the trend generally has been increasing in recent years, rising from about 3 per year in the mid-1990s to about 12 per year since 1998. During the 2005–2006 season nine polar bears were reported to have been taken in de-

fense of life or property. This trend appears to be related to changing sea ice conditions; polar bears must spend more time on shore and their increasing presence results in more human/bear interactions.

Data on the number of bears being taken by Alaska Natives, however, present only a part of the picture, inasmuch as each of the stocks that occurs in Alaska is shared with either Canada (southern Beaufort Sea stock) or Russia (Chukchi-Bering Sea stock) and is subject to hunting in those countries as well.

Table 3. Numbers of polar bears reported taken by Alaska Natives, 1980–2006

Harvest Year ¹	Total Taken	Chukchi/Bering Sea Stock	Beaufort Sea Stock
1980–1981	109	71	38
1981–1982	92	69	23
1982–1983	88	56	32
1983–1984	297	235	62
1984–1985	120	67	53
1985–1986	133	103	30
1986–1987	104	68	36
1987–1988	125	91	34
1988–1989	142	83	59
1989–1990	103	78	25
1990–1991	82	60	22
1991–1992	61	34	27
1992–1993	80	42	38
1993–1994	127	77	50
1994–1995	96	73	23
1995–1996	46	12	34
1996–1997	92	38	54
1997–1998	61	33	28
1998–1999	107	84	23
1999–2000	67	36	31
2000–2001	95	51	44
2001–2002	108	75	33
2002–2003	65	26	39
2003–2004	63	21	42
2004–2005	60	33	27
2005–2006	79	54	25

¹ Harvest year is 1 July to 30 June.
Data courtesy of the Fish and Wildlife Service.

Recognizing the potential for overharvesting the shared Beaufort Sea population, the North Slope Borough, representing polar bear hunters in Barrow, Nuiqsut, Wainwright, Atkasuk, and Kaktovik, entered into a management agreement with the Inuvialuit Game Council, representing hunters in Canada. The agreement was signed in 1988 and remains in effect. Although outside the scope of the Marine Mammal Protection Act, it is in some respects more restrictive than the provisions of the Act. For example, it prohibits the taking of bears in dens or bears constructing dens, and protects family groups made up of females and cubs, as well as any cubs less than 1.5 m (5 ft) in length. In addition, in an effort to ensure a sustainable harvest, the parties to the agreement jointly establish annual hunting limits, which are divided between the parties before the hunting season. In part because of that agreement, the southern Beaufort Sea stock has been fairly well studied and maintained in good health although recent observations have detected a reduction in cub survival and decreased skull measurements in adult males, presumably related to stress in the population due to the retreat of sea ice and associated impact on their ability to capture prey.

The situation involving the Chukchi-Bering Seas stock is markedly different. The most recent abundance estimate, which indicates a population of about 2,000 animals for this stock, is more than 10 years old and is not considered to be reliable. Up-to-date and reliable data also are needed on recruitment, survival, and movement patterns within the population. In addition, the total number of polar bears being removed by hunters is not known. Although hunting is currently prohibited in Russia, illegal harvest levels may be substantial. To address these concerns, the United States and Russia have concluded a bilateral agreement to conserve this stock, establish hunting limits, and provide a vehicle for cooperative research. The status of that agreement and efforts to implement its provisions are discussed in Chapter VIII.

Cook Inlet Beluga Whale (*Delphinapterus leucas*)

Cook Inlet beluga whales constitute one of five beluga whale stocks that occur in U.S. waters. They are considered to be a distinct stock based on their physical separation from the other stocks and on mitochondrial DNA analyses that indicate clear genetic differences. Unlike the other beluga whale stocks that occur in U.S. waters, the Cook Inlet stock has experienced a significant decline in recent years, prompting the National Marine Fisheries Service to designate the stock as depleted under the Marine Mammal Protection Act in 2000. Although the population is believed to have numbered more than 1,300 as recently as the late 1980s, it declined precipitously during the 1990s, primarily as a result of overharvest by Alaska Native subsistence hunters.

Because of their proximity to Anchorage, beluga whales in Cook Inlet are exposed to the activities occurring in and around the largest urban coastal area in Alaska. Service analyses of beluga whale sightings in Cook Inlet over the past 30 years indicate that the stock's summer range has contracted substantially in recent years. Compared with sightings in the 1970s and 1980s, animals are rarely seen now in offshore waters or the lower reaches of the inlet. In June, when the Service conducts aerial surveys of the population, beluga whales are concentrated in a few groups in the upper reaches of the inlet around the Susitna River delta, Knik Arm, Turnagain Arm, and Chickaloon Bay.

Stock Status

The Service designated the Cook Inlet beluga whale stock as depleted under the Marine Mammal Protection Act on 31 May 2000. At that time, the Service declined to list the stock under the Endangered Species Act, primarily because it believed that overharvest by subsistence hunters, which it had identified as the primary threat to the stock, was being adequately addressed. The Service concluded that,

although the population had been reduced to a small size, it did not meet the listing criteria because a stock with at least 300 individuals and a positive intrinsic growth rate was unlikely to go extinct due to stochastic events.

Contrary to the Service's expectations, the Cook Inlet beluga whale stock has not increased since harvest controls were established in 1999. In fact, it appears that the stock is continuing to decline, despite the fact that subsistence hunters are reported to have taken only five whales in the past eight years. The most recent point estimates of the population size are the lowest ever. The Service's estimates of population abundance were 278 in 2005 and 302 in 2006, suggesting a population of some 300, or slightly fewer, individuals. Abundance estimates dating back to 1994, when the Service began a rigorous monitoring program, and the confidence limits around those estimates, are provided in Figure 3. An analysis of these and related data

indicated an 81 percent likelihood that the population is declining despite very few recorded removals for subsistence. The Service has estimated the rate of decline at 4.1 percent per year. Furthermore, the existing data indicate a 98 percent probability that the growth rate of the population is less than 2 percent, which is the lower bound of the growth rate that the Service had predicted in 2000, and which would be considered normal for a population of small cetaceans.

In light of these recent population trends and the lack of any identified causes for the observed decline, the Commission has recommended for the past few years that the Service revisit its Endangered Species Act listing decision. The Service responded by publishing notice in the *Federal Register* on 24 March 2006 that it planned to reevaluate the status of Cook Inlet beluga whales and was initiating a status review of the population.

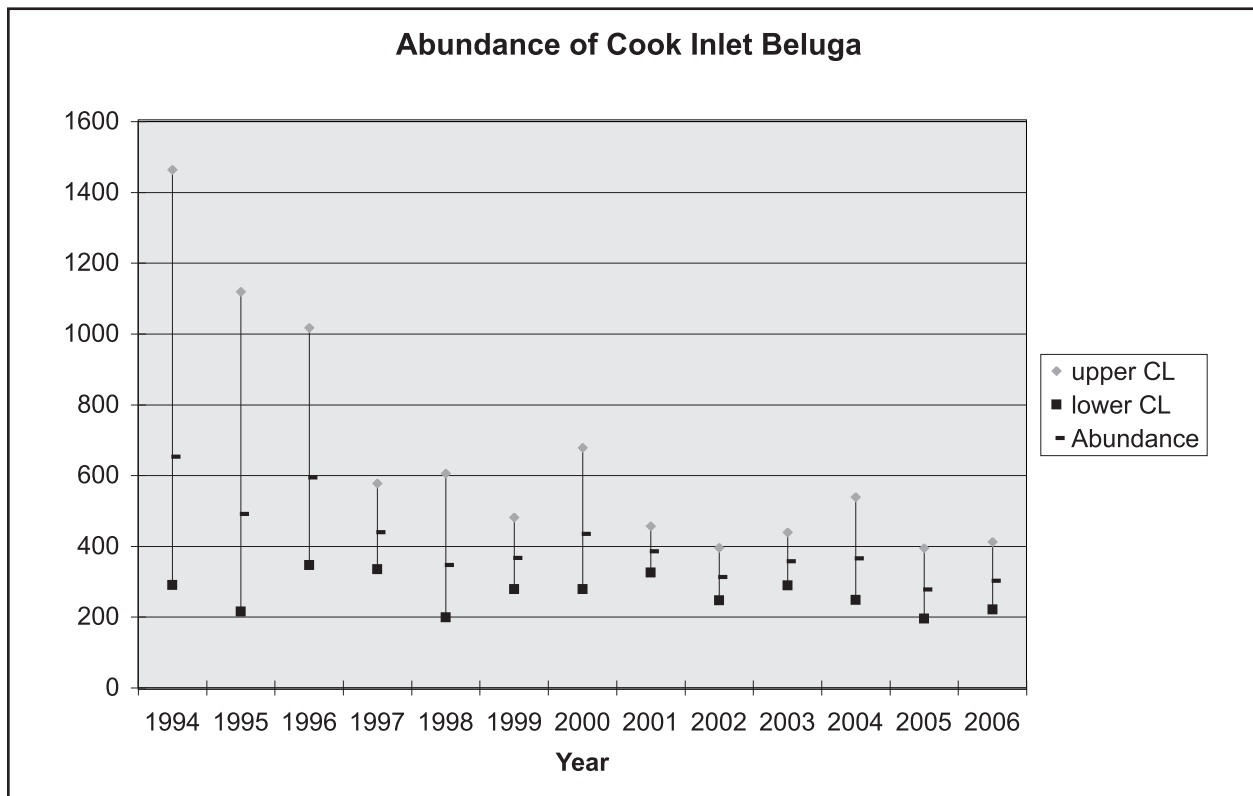


Figure 3. Abundance estimates (and upper and lower 95 percent confidence limits) of Cook Inlet beluga whales, 1994–2006. Data courtesy of the National Marine Fisheries Service.

The Commission provided comments by letter of 24 April 2006, reiterating its view that listing the stock as endangered is warranted. The Commission noted that the Cook Inlet beluga whale population numbered about the same as the North Atlantic right whale, which is generally considered by the Service and others to be among the most critically endangered cetacean species. The Commission also pointed to a recent review of the status of Cook Inlet beluga whales by the Cetacean Specialist Group of IUCN–The World Conservation Union in which it concluded that the stock qualified as “critically endangered” under the applicable IUCN criteria. The Commission believed that the case for listing was clear-cut and recommended that the Service move swiftly to list the stock and augment its research and conservation efforts. In fact, the Commission thought the situation was urgent enough that the Service should expedite publishing a proposed listing determination rather than waiting to complete the envisioned status review, and that the agency should even consider using the emergency listing provisions of the Endangered Species Act as an interim measure.

The Commission also responded to the Service’s call for information concerning the designation of critical habitat for the stock. The Commission expressed the view that the designation of critical habitat was one of the most important actions that the Service could take to prevent the extinction of the Cook Inlet beluga whale population and recommended that such a designation include all areas identified as “high-value” habitat in the draft conservation plan that the Service had prepared for the stock under the Marine Mammal Protection Act.

In addition, the Commission expressed concern that the lack of any detectable growth in the population since subsistence hunting was curtailed strongly indicates that some other factor or factors are operating to reduce survival or reproduction. As such, the Commission believed that the most urgent need is an expanded research effort to investigate those factors and

identify possible remedial actions. Despite this pressing need, the research budget for Cook Inlet beluga whales has been cut in recent years from about \$260,000 in fiscal years 2002 and 2003 to about \$85,000 in fiscal years 2004 and 2005. Funding at the lower level is barely sufficient to continue the annual surveys to monitor the status of the population. The Commission indicated that the Service’s responsibilities involved more than merely documenting the slow demise of the population toward extinction, and that it needed to take affirmative action to conserve the stock. The Commission recommended that the research budget for Cook Inlet beluga whales be increased to a level that would enable the Service to investigate the factors that are potentially inhibiting recovery of the population. The Commission suggested that such research might include foraging and habitat-use studies, analyses of contaminant levels in beluga tissues and their environment, systematic surveys to determine the probability of detecting strandings, an improved stranding response program to maximize the potential for rescue, and a necropsy program to maximize the information obtained from any deaths.

Although the Commission had recommended that the Service act quickly to list Cook Inlet beluga whales as endangered using expedited procedures, the Service opted for a more deliberate course of action by completing the status review before determining whether to propose a listing. At the end of 2006, it was expected that the Service would publish a proposed listing rule during the first part of 2007.

Conservation Plan

Section 115(b) of the Marine Mammal Protection Act directs the National Marine Fisheries Service to prepare a conservation plan as soon as possible for any stock designated as depleted unless it determines that such a plan will not promote the conservation of the species or stock. Conservation plans are to be modeled on recovery plans required under the Endangered Species Act. On 16 March 2005

the Service published a notice of availability of a draft conservation plan for Cook Inlet beluga whales. The document is available on the Service's Web site at www.fakr.noaa.gov/protectedresources/whales/beluga/mmpa/draft/conservationplan032005.pdf. The draft plan reviewed the biology and life history of Cook Inlet beluga whales and assessed the natural and human-induced factors that are or could be influencing the population. The Service identified four natural factors that could be impeding the recovery of the stock: stranding events, predation, disease, and environmental change. The Service considered nine types of human-induced factors that could be affecting the stock. These included subsistence hunting, commercial fishing and its potential effects on prey availability, pollution, vessel traffic, tourism and whale-watching activities, noise, oil and gas exploration and development, other types of development within Cook Inlet, and the possible effects of research activities. The draft plan laid out a proposed conservation strategy based on the identified threats to the stock, including a scheme to categorize important habitats and proposed monitoring and research plans.

The Marine Mammal Commission provided extensive comments on the draft conservation plan by letter of 27 June 2005. These are discussed in the previous annual report. In short, the Commission recommended that the plan be reorganized into a more focused document that clearly describes the threats to the population, identifies specific actions to address those threats, discusses how those actions would contribute to the recovery of the stock, provides a budget for each action, and establishes clear priorities for undertaking those actions. The Commission also commented on the section of the draft plan concerning the possible listing of Cook Inlet beluga whales under the Endangered Species Act, noting that coupling a listing review with development of the conservation plan would delay making a listing determination.

The Service continued to work on the conservation plan throughout 2006, but at the end of 2006 there was no definite schedule for its completion.

Native Subsistence Hunting

Section 101(b) of the Marine Mammal Protection Act allows Alaska Natives to take marine mammals for subsistence purposes or for making and selling handicrafts, provided that the taking is not done in a wasteful manner. Other limits may be placed on such taking only if a stock has been determined to be depleted or has been listed as endangered or threatened.

Estimates derived from several sources indicate that high levels of subsistence hunting of Cook Inlet beluga whales occurred throughout much of the 1990s (Table 4). Part of the impetus for this was the availability of commercial outlets in Anchorage for beluga whale muktuk (a popular Native food composed of the epidermis and underlying blubber of the whale). Such sales are allowed under the provision of section 101(b) of the Marine Mammal Protection Act that allows edible portions of marine mammals taken by Alaska Natives for subsistence purposes or for the creation of authentic Native handicrafts to be sold in Native villages and towns. Under the National Marine Fisheries Service's interpretation of the Marine Mammal Protection Act, Anchorage is considered a Native village. The high levels of subsistence taking are the most likely primary cause of the severe decline in the population observed in the 1990s.

The overharvest and precipitous decline of the Cook Inlet beluga whale stock led to a number of actions to prevent further decline and to promote the eventual recovery of the stock. At first, action was limited to a decision by some hunters to refrain voluntarily from taking whales. Subsequently, a stopgap legislative provision was enacted as part of the 1999 Emergency Supplemental Appropriations Act (Pub. L. 106-31) that prohibited, until 1 October 2000, the taking of a beluga whale from the Cook Inlet stock for subsistence purposes unless authorized

by a cooperative agreement between the National Marine Fisheries Service and an Alaska Native organization. Congress passed a revised provision in December 2000 (section 627 of Pub. L. 106-522) that extended indefinitely the prohibition on hunting Cook Inlet beluga whales unless authorized by the National Marine Fisheries Service through a cooperative agreement. Shortly before that, in October 2000, the Service had published proposed regulations that would govern the hunting of Cook Inlet beluga whales under the Marine Mammal Protection Act. As discussed later in this section, that rulemaking, although nearing completion, was still pending at the end of 2006.

The parties to that rulemaking agreed as an interim measure to limit subsistence taking from 2001 through 2004 to 1.5 whales per year, alternating between hunting limits of one and two whales each year. As reflected in Table 4, however, not all of the authorized strikes have been used. The case in 2004 was a special one, with all harvest being precluded because the level of “unusual mortalities” (e.g., from strandings) exceeded a threshold for shutting down the hunt that had been stipulated to by the parties.

The rulemaking parties reached a new tentative agreement in 2004 to govern subsistence hunting for the five-year period from 2005 to 2009. Under that agreement, the allowable number of takes would alternate between two in the odd-numbered years and one in the even-numbered years. Although one strike was authorized, no taking occurred in 2006. At the end of 2006 the fate of the harvest limits for 2007 was in question. In light of the low abundance estimates from the 2005 and 2006 surveys, the National Marine Fisheries Service was planning to meet with subsistence hunters to see if they would voluntarily forego hunting in 2007.

Regulation of Future Native Harvest

Based in part on the Commission’s advice, on 4 October 2000 the Service published a proposed rule to establish future harvest limitations. At about the same time, the Service

issued a draft environmental impact statement reviewing federal actions associated with the management and recovery of Cook Inlet beluga whales. The preferred alternative identified in the statement was the issuance of regulations to establish an annual strike limit of two beluga whales until the Cook Inlet stock is no longer depleted. This alternative was reflected in the proposed rule.

As discussed in detail in previous annual reports, the Service convened rulemaking hearings in December 2000 and 2004 to develop appropriate regulations. Based on the testimony at the hearing and submissions by the parties, the presiding administrative law judge issued a recommended decision in the matter on 8 November 2005. Applicable regulations require the Service to publish notice of the recommended decision in the *Federal Register* for a 20-day public comment period. The Service published that notice on 16 February 2006.

The Commission provided comments in its letter of 8 March 2006. The Commission referenced the extensive comments that it had submitted to the administrative law judge in April 2005 on the Service’s proposed long-term harvest regime. The Commission noted that, to the extent that the elements of the Service’s proposal had been incorporated in the recommended decision, they remained valid. In particular, the Commission believed that the recommended harvest management regime (1) responded too slowly to instances when the beluga whale population is declining, remaining stable, or growing at an unusually slow rate; (2) did not fully satisfy the stipulations that the parties had agreed to that were to govern the development of the long-term regime; and (3) did not require that the current population monitoring effort be maintained or, alternatively, include mechanisms that respond adequately to any diminishment in the quality of the data or the population estimates obtained.

The Commission recommended that the Service retain the flexibility to reconsider the interim harvest levels that would be established

through 2009 under the recommended decision. In this regard, the Commission noted that, when the 2005 population estimate is considered, the five-year abundance average drops below the proposed 350-whale “floor” that would trigger a cessation of the harvest under the recommended long-term regime. Although the Commission did not advocate an immediate cessation of all hunting based on that single low estimate, the Commission thought that the final rule should afford the Service that option if low abundance estimates persist. The Commission further recommended that, if the Service did not include such a provision in the final rule, that it encourage Native hunters to reduce or suspend hunting voluntarily under such circumstances.

The Commission’s letter also raised procedural questions concerning the Service’s

Federal Register notice. Although it had been published as a proposed rule, it did not include any proposed regulations. The Commission wondered if further opportunities for public participation in the process were planned or whether the Service believed that the final rule would be patterned closely enough on the proposed rule, originally published in 2000, that no further administrative process was necessary.

As of the end of 2006 a final rule had not been published, and the Commission had received no further indication of the Service’s plans for concluding the rulemaking.

Knik Arm Bridge

In 2003 the state of Alaska established the Knik Arm Bridge and Toll Authority to oversee construction of a bridge across Knik Arm in upper Cook Inlet. The bridge would connect

Table 4. Reported Alaska Native subsistence take of Cook Inlet beluga whales, 1993–2006

Year	Reported total number taken	Estimated range of total take	Reported number harvested	Estimated number struck and lost
1993	30 ¹	n/a	n/a	n/a
1994	21 ¹	n/a	19 ¹	2 ¹
1995	70	n/a	42	26
1996	123	98–147	49	49–98
1997	70 ²	n/a	35 ²	35 ²
1998	42 ²	n/a	21	21
1999	0	0	0	0
2000	0	0	0	0
2001	1	–	1	0
2002	1	–	1	0
2003	1	–	1	0
2004	0	–	0	0
2005	2	–	2	0
2006	0	–	0	0

¹ Estimated value (see 2002 stock assessment report).

² Represents a minimum value.

Data courtesy of the National Marine Fisheries Service.

the Municipality of Anchorage with the Matanuska–Susitna Borough. In September 2006 the bridge authority, in conjunction with the Federal Highway Administration, published a draft environmental impact statement (DEIS) under the National Environmental Policy Act to consider alternatives for the proposed bridge project and their impacts.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the DEIS and provided comments to the Federal Highway Administration on 17 November 2006, focusing on the potential effects on beluga whales. The Commission thought that the DEIS had identified most of the possible sources of impacts, including disturbance from construction activities, increased vessel operations, and increased human use of the Knik Arm area; masking of sounds used by beluga whales for communication, navigation, foraging, and predator avoidance; alteration of habitat-use patterns, particularly in transit corridors into and out of Knik Arm; changes in the distribution and abundance of prey; and increased risk of strandings. However, the analyses of these factors in the DEIS largely discounted the significance of these effects. The Commission questioned several conclusions that it believed were overly optimistic and thought that some of these might stem from a misunderstanding of the drafters as to how imperiled the Cook Inlet population of beluga whales is. The Commission found the assessment of possible cumulative impacts in the DEIS to be especially wanting, particularly in light of the fact that the population seems to be experiencing an ongoing decline for undetermined causes even in the absence of the additional stressors likely to result from construction and operation of the bridge.

The Commission also questioned whether the mitigation measures proposed in the DEIS would be sufficient to bring the bridge construction project into compliance with the Marine Mammal Protection Act's requirement that any resulting incidental taking have only a negligible impact on the affected marine

mammal populations. This point had been raised by the Commission in a separate letter, dated 22 September 2006 and addressed to the National Marine Fisheries Service, commenting on a request from the bridge authority for an incidental take authorization (see Chapter IX). Among other things, the Commission had noted the need for site-specific information but questioned whether the single season of data collection that had been completed would be sufficient to draw generally applicable conclusions about beluga whale habitat-use patterns in and around Knik Arm.

North Atlantic Right Whale *(Eubalaena glacialis)*

Numbering only 300 to 400 individuals, the North Atlantic right whale is one of the world's most endangered mammals. Intensive commercial whaling prior to the early twentieth century all but eliminated a population in coastal waters off Europe and northwest Africa and severely depleted the western North Atlantic Ocean population off the United States and Canada. At least five major habitats are used seasonally by the western population, including the species' only remaining calving grounds off Florida and Georgia, used from early December through early April, and four feeding grounds off New England and southeastern Canada (i.e., Cape Cod Bay and the Great South Channel off Massachusetts, the Bay of Fundy just north of the U.S.–Canada border, and Roseway Basin south of Nova Scotia).

Commercial whaling for right whales in the North Atlantic ended after an international treaty adopted in 1935 called for a worldwide ban on hunting right whales. Almost no information exists on the species' abundance and trends from the early 1900s to the late 1970s, when a dedicated right whale research program was begun. Since then, abundance estimates have remained virtually unchanged. A major reason for the lack of recovery appears to be incidental mortality due to collisions with ships

and entanglement in commercial fishing gear (Figure 4). During the 1990s those deaths, when combined with natural mortality and variation in calving intervals and environmental conditions, appear to have been roughly equal to reproductive levels. Reproduction averaged about 11 calves per year during the late 1990s but has increased to an average of more than 20 calves per year since 2001. Based on the right whale carcasses observed since 1990, more than half of all deaths (28 of 50) were attributed to either ship collisions (at least 22 deaths) or entanglement (at least 6 deaths). Observed mortality underestimates total mortality due to those causes, particularly from entanglement in fishing gear, because not all carcasses are found.

Although the National Marine Fisheries Service has lead responsibility for the recovery of North Atlantic right whales, several other agencies and organizations assist the Service in this work. These include the U.S. Coast Guard, the Navy, the Army Corps of Engineers, the Marine Mammal Commission, various state agencies (particularly, the Florida Fish and Wildlife Conservation Commission, the Georgia Department of Natural Resources, the Maine Department of Natural Resources, and the Massachusetts Division of Fisheries), the New England Aquarium, the Provincetown Center for Coastal Studies, and the International Fund for Animal Welfare. The Canada Department of Fisheries and Oceans also has a program to protect right whales in Canadian waters.

Right Whale Deaths and Injuries in 2006

During 2006 six dead right whales and at least six injured or entangled right whales were observed. Of the six dead whales, four had died as a result of ship collisions and one from entanglement; the cause of the other death was undetermined. The total of four documented vessel-related deaths was the highest recorded to date for a single year. Since 2001, 13 lethal ship collisions have been documented (Figure

4). The trend has been particularly disturbing because 6 of those 13 deaths have involved mature females, some of which were carrying full-term fetuses, and four other vessel-related deaths were of female calves or subadults. Females are particularly important for the species' survival and recovery.

The year's first death was of a male calf struck by a ship on the calving ground. Found on 10 January a mile off the entrance to the St. Johns, Florida, shipping channel, it had a large deep propeller gash on its back and associated bruising. The second death was of a female calf that died on the calving grounds after becoming entangled in a gillnet. Found on 26 January 16 miles off Jacksonville Beach, Florida, it had fresh net marks on its peduncle and flukes and a large cut on the hind third of its back. The third death was of a large right whale reported by the Coast Guard to be floating 15 nmi off Long Island, New York. The carcass was too badly decomposed to tow ashore and, with no opportunity for close inspection, cause of death could not be determined.

The three other confirmed deaths in 2006 involved collisions with vessels. On 24 July a female calf was found floating northeast of Grand Manan Island in the Bay of Fundy, Canada, with 13 propeller slashes on its right side. On 24 August, an adult female was reported floating in the Roseway Basin off the southern tip of Nova Scotia. The carcass was resighted on 3 September 8 nmi off Yarmouth, Nova Scotia, and towed ashore where a necropsy revealed 16 fractured vertebrae and a large dorsal bruise, indicating that the cause of death was massive blunt trauma. The last confirmed death of the year was of a two-year-old male found floating 10 nmi off Brunswick, Georgia, on 30 December with 20 propeller slashes extending from its head back along its right side.

The six non-lethal injuries documented in 2006 included two caused by vessel collisions, three entanglements, and one from being trapped in a fishing weir. The first was a calf seen with its mother in the Corpus Christi,

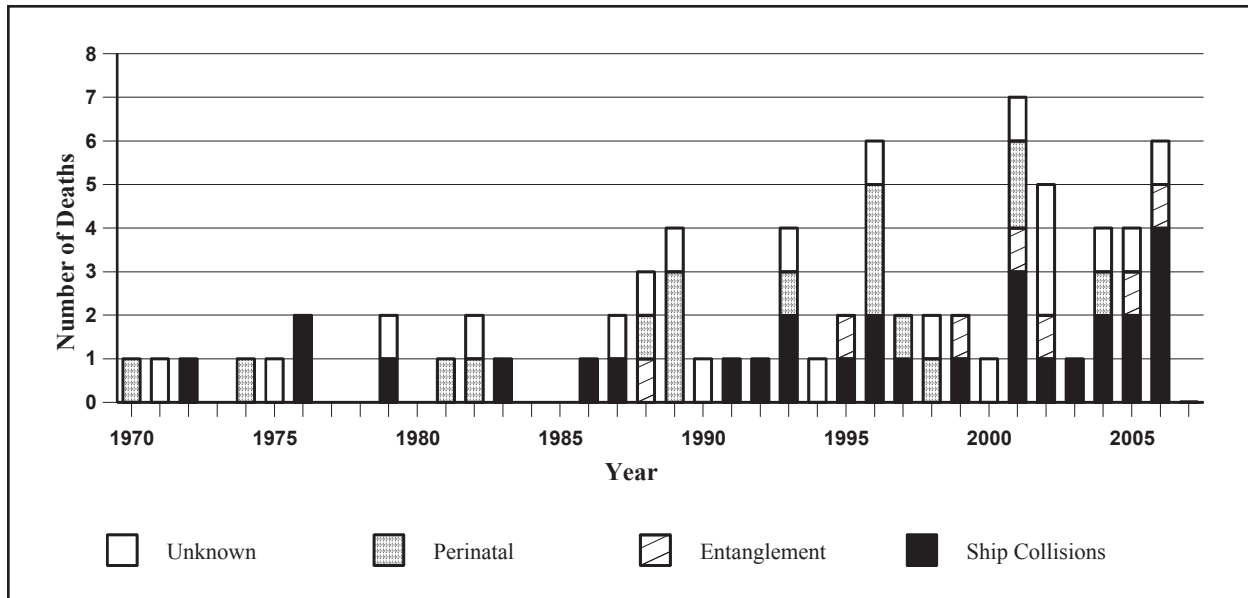


Figure 4. Known mortality of North Atlantic right whales, 1970–2006. Figure based on data from various sources and compiled by the Marine Mammal Commission.

Texas, ship channel on 16 January. The occurrence of right whales in the Gulf of Mexico is very rare. The calf had fresh propeller wounds on its back, but the injuries did not appear to be lethal. The pair was resighted off the west coast of Florida on 1 March and again on 7 September in the Bay of Fundy feeding ground, where the calf appeared to be recovering from its injuries. The second injury, also caused by a vessel, was to a one-year-old juvenile seen on 11 March off Brunswick, Georgia, with fresh propeller wounds on its back (Figure 5). The same animal had been photographed on that calving ground with no injuries on 18 February, suggesting that it was hit somewhere on the calving ground. The whale was not resighted in 2006.

Three new entanglements also were documented in 2006, all of which involved whales first seen entangled in late summer in the Bay of Fundy, Canada. On 16 August a whale-watching boat reported a large right whale entangled nine miles southeast of Brier Island, Nova Scotia, with several wraps of line around

its peduncle and a large ball of tangled white line. Photographs indicated that the animal was in good condition at the time, but the image was not good enough to enable investigators to match a known individual in the right whale catalog. Efforts to relocate the animal for disentanglement were unsuccessful, and its fate is uncertain. On 17 September a right whale research team reported another unidentified right whale as entangled 14 nmi northeast of Grand Manan Island. It was a large whale with green line trailing from its mouth and wrapped around its rostrum. This whale appeared to be in good condition at the time of the sighting but was not resighted in 2006. The third entanglement was of a juvenile seen by right whale researchers on 27 September 17 miles east of Grand Manan Island. That whale had line trailing from its mouth toward its flipper and back to the flukes. It was relocated the following day, at which time a disentanglement team removed some of the trailing line. Although it had some abrasions and scarring from the attached line, the animal appeared to be in good condition



Figure 5. Right whale #3255 struck by a vessel on the southeast U.S. calving grounds early in 2006. Photograph by Brenna Kraus, New England Aquarium.

at that time. The last fisheries-related interaction reported in 2006 involved a 40-foot whale trapped in a herring weir. No nets were set on the weir at the time of the entrapment and, after a few poles were removed, the animal swam free with only a few scratches.

From 2000 through 2006, disentanglement teams have been able to remove some or all gear from 11 of 28 right whales reported entangled (Table 5). Of the 11 whales, 3 have been resighted subsequently free of the gear and in good condition; 5 have been resighted in fair, poor, or improving condition; and 2 are known or assumed to have died from the injuries. One—whose condition was uncertain at the time it was disentangled—was not individually identified so its fate is unknown.

Management and Prevention of Collisions with Ships

Evidence of massive blunt trauma and large propeller wounds on the carcasses of ship-struck right whales indicate that most vessel-related deaths are caused by large rather than small or medium-sized ships. To reduce collisions, the National Marine Fisheries Service has relied on public outreach and voluntary ac-

tions by vessel operators to avoid hitting right whales. Among other things, the Service and its partner agencies and organizations have distributed brochures, placards, videos, and articles advising vessel operators to be alert for whales and to reduce speeds or maneuver around the animals when they are seen. Intensive aerial surveys also have been mounted in high-use right whale habitats to locate whales and advise mariners of these locations via voice radio, notices to mariners, telexes to ships, Web site postings, and e-mail messages. In 1999 the Service and the Coast Guard also established two Mandatory Ship Reporting areas—one in the right whale calving grounds off Florida and Georgia and the other in important feeding areas off Massachusetts. In those areas, operators of large ships are required to report to a shore station to obtain information on right whale protection and recent whale sightings whenever they enter the defined areas.

Unfortunately, even under good sighting conditions, vessel operators are unable to reliably detect all whales near a vessel. As a result, collisions occur when whales are either unseen or seen too late to be avoided. Also, it is not clear to what extent vessel operators have heeded the advice provided in outreach materials and avoided areas where recent right whale sightings have been reported. As a result, reliance on vessel operators to detect and avoid whales is of limited value at best, and outreach efforts alone have produced no detectable decrease in vessel-related right whale deaths.

Recognizing the need for more effective measures, the Marine Mammal Commission in the late 1990s recommended to the Service that steps be taken to institute measures limiting vessel speeds and altering shipping routes in high-use right whale habitats. The recommendation led to the preparation of a report submitted to the Service in August 2001 recommending a series of speed and routing measures for right whale feeding and calving grounds and port access channels along the species' coastal migratory corridor. Over the past five years, the

Table 5. Fate of entangled North Atlantic right whales observed between 2000 and 2006

Status as of last sighting	No gear removed	Some gear removed	All or most gear removed	Total
Gear-free and in good condition	4	2	1	7
Gear-free and in fair, poor, or improving condition	1	2	1	4
Entangled in good condition	1	1	–	2
Entangled in fair, poor, or improving condition	3	2	–	5
Known or assumed dead	2	1	1	4
Not resighted/condition uncertain	5	–	1	6
Total	16	8	4	28

Service has been developing and analyzing such measures as part of a new ship-strike reduction strategy. As discussed in past annual reports, major steps have included the following:

- In November 2001 the Service formed an internal working group to review recommendations made in the August 2001 report and develop a strategy to reduce ship collisions with right whales.
- On 2 October 2003 the Service convened an interagency meeting to seek advice on developing a ship-strike strategy.
- On 1 June 2004 the Service published an advance notice of proposed rulemaking requesting comments on speed and routing measures.
- On 18 February 2005 the Coast Guard announced its intent to initiate a port access route study to assess ways to alter routes of ships into U.S. ports in the southeastern and northeastern United States to reduce whale collision risks.
- On 22 June 2005 the Service published a notice of intent to prepare an environmental impact statement on operational measures for its ship-strike strategy and requested comments.

The Service's evolving ship-strike reduction strategy has five components: research, public outreach, a cooperative agreement with Canada, section 7 consultations as necessary, and new operational measures for ships. The last component, which includes steps to restrict vessel speeds and redirect vessel traffic patterns, is especially important. Efforts to institute operational measures in 2006 are discussed later.

Speed Restrictions: On 26 June 2006 the Service published proposed rules to implement vessel speed restrictions in times and areas where right whales are likely to occur. On 7 July 2006 an accompanying draft environmental impact statement also was released for public review. The proposed rules call for a seasonal 10-knot speed limit in the species' calving and feeding grounds and within a 30-nmi radius around entrances to major ports along the species' coastal migratory corridor (Table 6). The rules would apply to all vessels greater than 19.8 m (65 feet) in length that are registered in the United States or are entering or leaving a U.S. port. In addition, the proposed rules would allow the Service to establish temporary 15-day speed restrictions around transitory concen-

trations of whales observed anywhere, at any time, in the U.S. Exclusive Economic Zone off the Atlantic coast. Temporary zones also could be established in designated shipping channels off major ports if one or more right whales were found to be lingering in that channel. The perimeter of temporary zones would extend 15 nmi around the core sighting area. In publishing its proposed rules, the Service asked for comments on the possibility of implementing alternative speed limits of 12 or 14 knots.

On 15 August 2006 the Commission responded to the Service's notice, commending it for its efforts. The Commission recommended that the Service adopt the proposed rules, including the 10-knot speed limit, the identified boundaries for seasonal management areas, and the time frames for the management areas. With regard to the identified speed limit, the Commission examined available collision records with data on the speed of vessels at the

time whales were hit (Figure 6). Those data suggest that serious or lethal injuries to whales are rare when vessels are traveling at less than 10 knots, increase rapidly at speeds of between 10 to 13 knots, and are most common when vessels are traveling at 14 to 15 knots or faster. Why collisions are less likely at slower speeds is unclear although it may be because whales are able to detect and avoid vessels traveling at slower speeds or vessel operators are more able to detect and avoid whales. Or it could simply be because most of the time vessels travel at speeds in excess of 10 knots. Nevertheless, based on those data, the Commission concluded that a speed limit of 14 knots likely would offer little—and possibly no—reduction in the risk of collisions. The Commission also noted that it was important to recognize that human nature would compel some vessel operators to travel at speeds slightly above any established limit. Thus, if a 12-knot limit were imposed and most

Table 6. Management areas proposed by the National Marine Fisheries Service for seasonal vessel speed restrictions to protect North Atlantic right whales

Area	Season
Entrances to:	
Block Island Sound	1 November – 30 April
Port of New York/New Jersey	1 November – 30 April
Delaware Bay	1 November – 30 April
Chesapeake Bay	1 November – 30 April
Morehead City/Beaufort, North Carolina	1 November – 30 April
Wilmington, North Carolina	1 November – 30 April
Georgetown, South Carolina	1 November – 30 April
Charleston, South Carolina	1 November – 30 April
Savannah, Georgia	1 November – 30 April
Southeast U.S. calving grounds	15 November – 15 April
Cape Cod Bay	1 January – 15 May
Southern entrance to Massachusetts Bay (off the northern tip of Cape Cod)	1 March – 30 April
Great South Channel (east of Cape Cod)	1 April – 31 July

vessels actually traveled a knot or two faster, they would be moving at speeds that could offer little or no whale protection. The Commission therefore recommended that the Service adopt the 10-knot speed limit as proposed.

As noted earlier, injuries on right whale carcasses suggest that most lethal ship strikes are caused by large vessels. The Commission therefore supported the Service’s proposal to apply the speed restrictions to vessels 65 feet or longer. However, the Commission also noted that smaller vessels pose risks to whales, at least when traveling in the calving grounds. It noted that calves and mothers with calves spend a large proportion of their time at the surface where they could be hit by a vessel and that the small size of calves makes them more vulnerable than adults to serious injury by smaller vessels. The Commission also noted that, since 2001, fresh propeller wounds of a size possibly

caused by small vessels had been seen on several seriously injured right whales in the calving grounds, and that in April 2005 a 42-foot vessel transiting the calving grounds struck and seriously injured an adult female that was not likely to survive. Noting the special importance of protecting adult females and calves, the Commission recommended that, for the management area covering the species’ calving grounds only, the Service apply seasonal speed restrictions to all motorized vessels 40 feet or longer instead of 65 feet or longer.

Finally, the Commission commented on the Service’s proposed approach for designating temporary speed restrictions around whale aggregations. The proposed trigger for designating such areas is the same as that used to designate the dynamic area management zones for fishery restrictions under the Large Whale Take Reduction Plan (see discussion in follow-

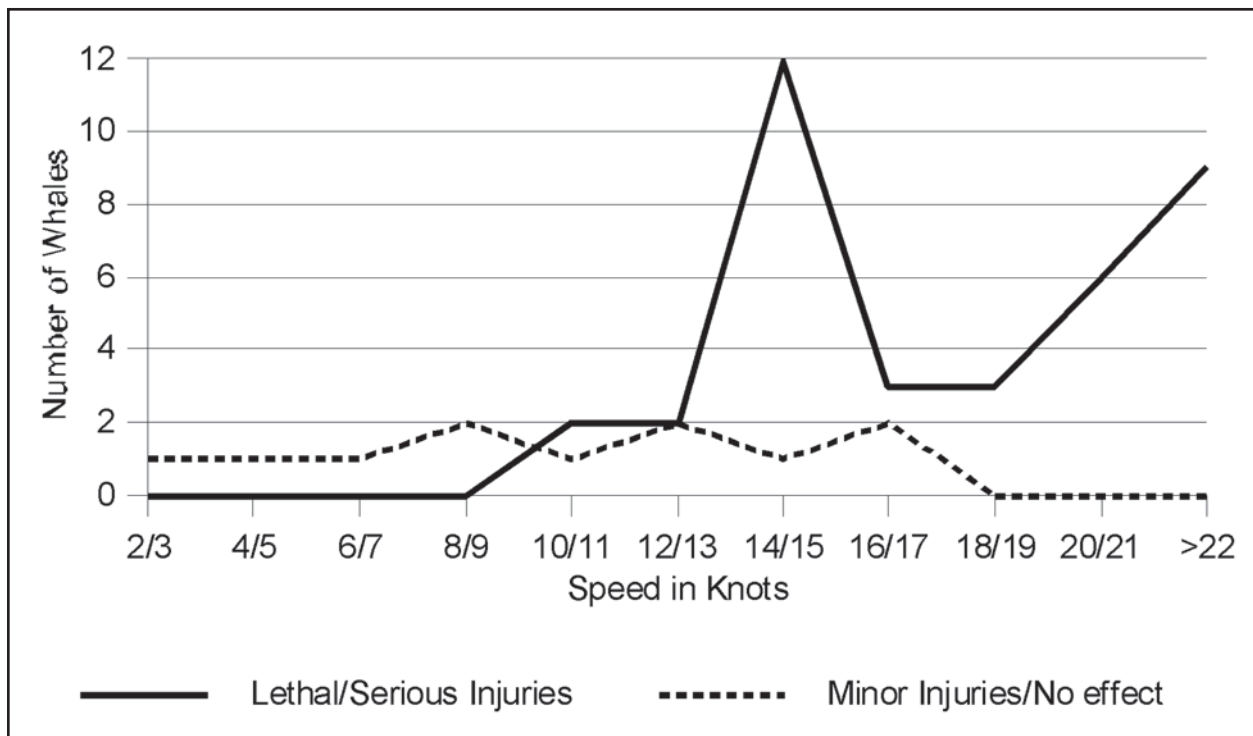


Figure 6. The number and severity of injuries to whales caused by ships traveling at known speeds at the time of collision. “Lethal/Serious Injuries” = observation of a dead whale or evidence of bleeding wounds following a collision. “Minor Injuries/No effect” = collision report with no mention of blood or with whales seen swimming away with no bleeding wounds apparent. Data courtesy of Marine Mammal Commission and National Marine Fisheries Service.

ing section). It includes any reliable sighting of three or more whales such that their density is 0.04 whale per square nautical mile or four whales within 100 square nautical miles. Analyses of past right whale sightings have shown that such sightings are likely to indicate a group of feeding whales that will remain within 15 nmi of the initial sighting location for at least two weeks. However, the Service's policy for designating dynamic area management zones for fisheries requires that a confirmation of the initial sighting and those effective dates be deferred until a temporary rule is drafted and published in the *Federal Register*. That procedure delays imposition of effective dates by two weeks or more, thereby undercutting, and in some cases eliminating, the usefulness of temporary zones. To avoid such delays, the Marine Mammal Commission recommended that, for purposes of establishing temporary speed restrictions, the Service adopt procedures that would make the restrictions effective after a single observation of right whale densities that satisfies the criterion already discussed and immediately upon the first Coast Guard broadcast to mariners identifying an area's boundary.

On several occasions over the past several years the Commission has recommended that, to expedite matters, the Service use its emergency rulemaking authority to restrict vessel speeds on an interim basis. The Service replied, however, that it was moving as quickly as possible and that emergency rules could not be implemented on a faster schedule. Late in 2006 the Service was preparing a final rule in response to public comments on the proposed rule. The Commission understood that the Service expected to publish final rules in 2007.

Routing Measures: The Service's ship-strike reduction strategy also calls for non-regulatory measures to alter vessel traffic routes through areas where right whales are likely to occur. Those measures are to be developed cooperatively with the Coast Guard and are designed to route vessels away from areas where right whales have previously been sighted on

a frequent basis. In April 2006, using whale sighting data provided by the Service, the Coast Guard completed a port access route study examining vessel traffic patterns through right whale feeding and travel areas off Massachusetts (i.e., Cape Cod Bay, waters around the northern tip of Cape Cod, and the Great South Channel east of Cape Cod) and calving grounds off Georgia and northern Florida.

For the calving grounds, the report recommended that a precautionary area be established to warn and advise vessel operators of the risk of colliding with right whales. It also recommended designating six two-way travel routes off the ports of Jacksonville and Fernandina Beach, Florida, and Brunswick, Georgia. Although vessels are not required to follow two-way travel routes, they are to be marked on nautical charts and operators of large ships often use them to plot routes in and out of port. The recommended routes were established in November 2006 and at the end of 2006 the Service and the Coast Guard were taking steps to mark the routes on nautical charts and to otherwise advise mariners of their establishment.

For feeding grounds off Massachusetts, the Coast Guard recommended a precautionary area at the southern entrance to the Cape Cod Canal and a pair of two-way traffic routes through Cape Cod Bay from the canal and from Boston to Provincetown at the tip of Cape Cod. The Coast Guard also recommended shifting the designated traffic separation scheme into the port of Boston 12° north. The shift would route vessels about 10 miles farther north from the tip of Cape Cod through an area on Stellwagen Bank where whale sightings have been relatively low. Traffic separation schemes, like divided highways for automobiles, are parallel one-way channels that separate traffic moving in opposite directions. Traffic separation schemes must conform to international shipping rules and, therefore, the proposals were submitted to the International Maritime Organization for review. In December 2006 the organization approved the route modification, which is ex-

pected to become effective on 1 July 2007 and will be marked on future nautical charts.

Entanglement in Fishing Gear

In 1997 the National Marine Fisheries Service adopted an Atlantic Large Whale Take Reduction Plan pursuant to provisions of the Marine Mammal Protection Act. The goal of the plan is to reduce entanglement and incidental mortality of large whales, mainly in lobster fishing gear and gillnets along the East Coast of the United States. Although the plan addresses several species of large whales caught and killed incidentally in such gear, its focus has been almost exclusively on right whales because of their highly endangered status. The Marine Mammal Protection Act requires that such plans set forth measures that will reduce deaths from entanglement to levels below a stock's potential biological removal (PBR) level within six months of implementation. The PBR level is defined as the number of animals that could be removed (not counting natural mortality) and still allow a high level of confidence that the population will increase toward its optimum level. Because of the low abundance of North Atlantic right whales, the Service has set this level at zero. The Act also requires that the Service convene take reduction teams tasked with recommending appropriate measures for take reduction plans. The teams are to include representatives of relevant fisheries, environmental groups, the scientific community, and federal and state agencies. A Commission staff member serves on the Atlantic Large Whale Take Reduction Team.

The Atlantic large whale plan adopted by the Service relies principally on two basic approaches: (1) requiring gear modifications to reduce the likelihood that fishing gear will entangle whales, and (2) disentangling whales. The Service has established various seasonal and dynamic area management zones (i.e., temporary zones around aggregations of feeding whales) where more stringent gear modifications are required. Among the gear modifica-

tions that have been encouraged or required are (1) weak links designed to break under the strain of an entangled whale, (2) sinking or neutrally buoyant line in place of floating line used to link pieces of gear (called ground lines), and (3) limits on the number of buoy lines used to mark fishing gear.

Because serious and lethal right whale entanglements have continued with no sign of diminishing, the Service has reconvened its take reduction team and made frequent major and minor alterations in the take reduction plan. Those changes have been limited principally to requiring the designated gear modifications to be applied in more areas for more fisheries, adjusting required breaking strengths for weak links, and requiring weak links in more places on fishing gear. As noted in past annual reports, the Commission has consistently recommended that the Service place less emphasis on gear modifications and more emphasis on area and season closures to keep all hazardous fishing gear out of areas where right whales aggregate seasonally. Although the Service routinely uses closures to conserve fish stocks, it has consistently rejected this alternative to protect right whales.

In June 2003, after reviewing evidence that right whales were still being entangled in fishing gear outfitted with the required weak links, the Service announced plans to prepare an environmental impact statement on possible plan revisions and requested comments on the proposal. The Commission again recommended that the Service consider options to seasonally close right whale critical habitats and other high-use areas to all hazardous fishing gear. In February 2005 the Service circulated a draft environmental impact statement that considered alternatives for expanded use of gear modifications in more areas for more fisheries but failed to consider any options to close fishing seasonally in high-use right whale habitats. On 12 May 2005 the Commission advised the Service that the document was inadequate because it did not consider such options and again recommended

that high-use right whale habitats be closed to all hazardous fishing gear during periods of peak whale abundance.

On 21 June 2005 the Service published proposed rules to implement an exceedingly complex set of proposed gear modification requirements. The principal feature was a requirement to use sinking or neutrally buoyant line for ground lines in trap fisheries in most areas by 2008. The Commission welcomed this requirement because it would eliminate use of buoyant lines that can float up and form loops between traps that could entangle whales. However, most whales are believed to become entangled in vertical buoy lines for which no effective risk reduction measures have been identified. As noted already, the current rules proved to be deficient in 2003 after a right whale was entangled and killed in a buoy line equipped with a compliant weak link. No new measures have been identified to avoid entanglements in such vertical lines. On 30 August 2005 the Commission therefore again recommended that the Service adopt rules to prohibit hazardous fishing gear, including any gear with vertical buoy lines, in designated right whale critical habitats until new measures are developed that provide reasonable assurance that right whales will not be entangled.

During 2006 the Service failed to adhere to its rulemaking schedule and, as of the end of 2006, final rules to amend the Atlantic Large Whale Take Reduction Plan were still pending. On 6–8 December 2006 the Service reconvened its Atlantic Large Whale Take Reduction Team to seek recommendations and advice on the final rules and on a strategy to address whale entanglements in vertical lines. Because the Service was unable to publish final rules, the team was unable to comment on them. With regard to developing a strategy to address vertical lines, the team reviewed the status of research on possible alternatives under consideration. Those included options for use of stiff rope, weak rope, glowing rope, fat-soluble rope, slippery rope, modifications to weak links, pop-up

buoys that remain on the bottom until vessels arrive to haul gear, time-tension line cutters, increasing the number of traps per buoy, buoy messenger line systems, limiting the number of buoy lines per trawl, and prohibiting vertical lines in high-use right whale areas. Team members had differing views as to what approaches were most promising but offered advice on future research needs.

Gillnet Fishing on the Right Whale Calving Grounds: As a related yet separate matter, the Service took steps to curtail gillnet fishing in right whale calving grounds. Provisions in the Atlantic Large Whale Take Reduction Plan allow gillnet fishing in the right whale calving grounds subject to certain restrictions on shark and mackerel gillnets during the peak of the calving season (i.e., 15 November to 31 March). Those restrictions apply within an area called the “southeast U.S. restricted area,” which extends from the Georgia–South Carolina border to a point south of Cape Canaveral, Florida. Since those rules were developed, a new gillnet fishery for whiting developed off northern Florida. Because it targeted a species not addressed in the large whale plan, the fishery was not subject to restrictions. However, the plan also requires that, if a right whale is entangled in the restricted area in allowed fishing gear, the Service must close the area to that type of gear unless revised rules are adopted that provide protection equivalent to a closure.

As noted earlier, a right whale calf killed by entanglement in a gillnet was found on the calving ground off Florida on 26 January 2006. The Service determined that the animal had been killed in permitted gear in the restricted area during the calving season. Therefore, on 16 February the Service published a temporary rule banning all gillnet fishing in the southeast restricted area for the remainder of the calving season (i.e., until 31 March 2006). To help determine rules for future fishing seasons in that area, the Service convened a meeting of the southeast subgroup of the Atlantic Large

Whale Take Reduction Team on 11–12 August 2006. A Commission staff member participates in this subgroup.

During that meeting, the subgroup agreed that, subject to further restrictions, gillnet fishing for shark and mackerel could continue in the southern end of the restricted area (south of 29° N latitude) early and late in the calving season (i.e., before 31 December and after 1 March). This was based largely on sighting records that indicate that right whales rarely occur in that portion of the calving grounds during those times. The additional recommended restrictions included a requirement to ban fishing at night, immediate removal of nets from the water if a right whale is seen or reported within 3 nmi of the fishing location, an 800-yard limit on the length of nets, and a limit of two nets per boat with only one net in the water at a time. The team was unable to reach consensus on acceptable measures for the northern part of the restricted area. Some members recommended that all gillnet fishing be prohibited and that the boundary of the restricted area be extended north to the South Carolina–North Carolina border to protect mother/calf pairs recently seen in those waters. Other members suggested that fishing should be allowed subject to additional restrictions, including more weak links, no night fishing, and required observers.

Based on results of the meeting, the Commission wrote to the Service on 15 May 2006. In its letter, the Commission commended the Service for its quick closure of the restricted area for the remainder of the 2005–2006 calving season. With regard to new permanent rules, the Commission recommended that the Service prohibit all gillnet fishing in the southeast restricted area from 15 November through 15 April, with the exception of shark and mackerel gillnet fishing south of 29° N latitude as recommended by the southeast subgroup (Figure 7). It recommended ending the restricted period on 15 April rather than on the previously established 31 March because of recent right whale sightings in the

calving grounds in early April. The Commission also recommended that the restricted area be extended north to the North Carolina–South Carolina border within 40 nmi of the coast and that gillnet fishing in the extended area be prohibited from 1 November to 30 April. Although gillnet fishing currently is not known to occur in that area during that period, the Commission noted that the measure would prevent new unregulated fisheries from developing as had occurred off Florida. The Commission also noted that right whale mother/calf pairs have recently been reported off South Carolina and that the extended dates in that area would help protect migrating whales that arrive early in the core calving area or leave late.

Although the Service was to have developed new rules in time for the start of the 2006–2007 calving season, by fall 2006 no new proposed rules had been published. Therefore, on 28 September the Commission wrote to the Service recommending that it immediately publish emergency rules to either (1) close the restricted area as it had in the previous calving season or (2) close it subject to the exception agreed to by the southeast subgroup at its April meeting. On 15 November 2006 the Service published a new emergency rule closing the southeast U.S. restricted area north of 29°N latitude and within 35 nmi of the South Carolina coast to all gillnet fishing from 15 November 2006 to 15 April 2007.

Also on 15 November 2006 the Service proposed and requested comments on a permanent rule for gillnet fishing in the calving grounds for future calving seasons. The proposed permanent rule incorporated most of the recommendations in the Commission's 15 May letter. However, the seaward boundary for northern extension of the restricted area was set at 35 rather than 40 nmi from shore and the effective dates for the area were 15 November to 15 April rather than 1 November to 30 April.

On 19 December 2006 the Commission wrote to the Service, expressing support for the proposed rule and for extending the restricted

area northward. However, the Commission again recommended that the effective dates for waters off South Carolina be revised to cover the period 1 November through 30 April. It noted that during their northward and southward migrations, right whales must occur in the northern area both earlier and later in the season, respectively, than they occur in the southern area. In addition, recently deployed acoustic monitoring buoys have recorded right whale calls in late April near the North Carolina–South Carolina border.

The Commission also modified its previous recommendation regarding the offshore boundary. It recommended that the outer boundary for the entire restricted area, including the area off South Carolina, be extended to the outer edge of the U.S. Exclusive Economic Zone. In this

regard, the Commission noted that representatives of the Service had advised the southeast subgroup that such an extension would likely be included in the Service’s final rule to amend the Large Whale Take Reduction Plan. Although provisions in the 15 November proposed rule for the southeast restricted area differed from those in the Service’s 21 June 2005 proposal for the overall large whale plan, an extension to cover the entire Exclusive Economic Zone would conform to the boundary already under consideration by the Service.

At the end of 2006 the Commission understood that a final permanent rule for gillnetting in the right whale calving grounds would be published in 2007 and that the new measures proposed in those rules would be incorporated into revisions of the large whale plan.

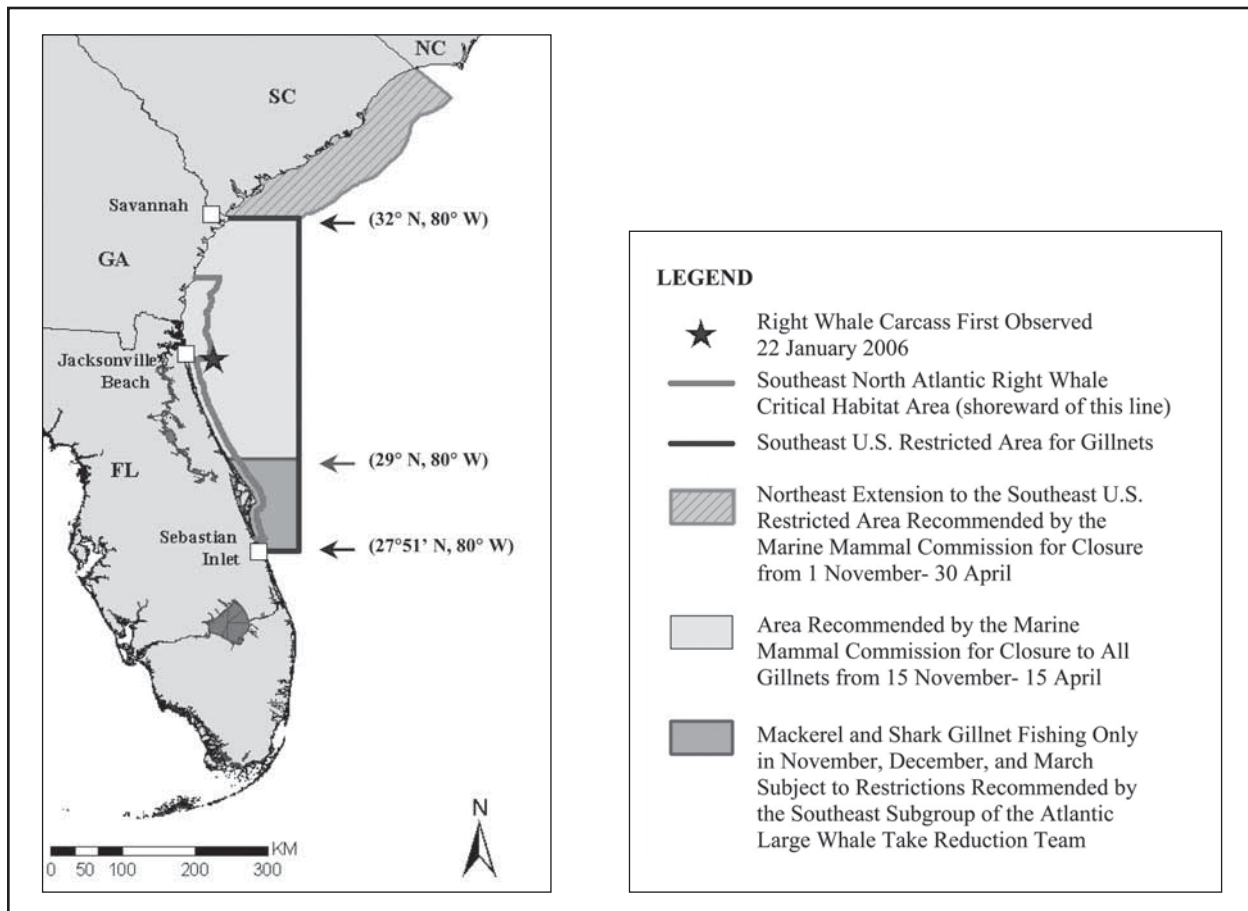


Figure 7. Southeast U.S. gillnet fishing restrictions for North Atlantic right whale calving grounds as recommended by the Marine Mammal Commission.

Status of North Atlantic Right Whales under the Endangered Species Act

When right whales were first listed as endangered under the Endangered Species Conservation Act of 1969 (the precursor to the Endangered Species Act), all right whales in the Northern Hemisphere were listed as a single species, the northern right whale, *Eubalaena glacialis*. This included populations in both the North Atlantic and North Pacific Oceans. Since then, genetic studies have demonstrated that right whales in the two ocean basins are separate species: the North Atlantic right whale, *E. glacialis*, and the North Pacific right whale, *E. japonica*. This distinction is now accepted in the scientific literature and used by international organizations, such as the International Whaling Commission and IUCN–The World Conservation Union. To reflect this new understanding, on 27 December 2006 the National Marine Fisheries Service published proposed rules to amend the List of Endangered and Threatened Species to recognize each species separately, with both species retaining their endangered status. In 2007 the Commission will write to the Service in support of the proposed change.

Marine Mammal Commission Review of the North Atlantic Right Whale Protection Program

As part of its response to a congressional directive that the Commission review the biological viability of the most endangered marine mammals and make recommendations on the cost-effectiveness of current protection programs, the Marine Mammal Commission convened a panel to review the right whale protection program. Results of that review, held 14–17 March 2006, are discussed in Chapter IV.

North Pacific Right Whale (*Eubalaena japonica*)

The North Pacific right whale is one of the least studied and least well known of the

world's large whale species. Right whales were severely depleted by commercial whaling in the 1800s across a broad swath of the North Pacific Ocean from North America to Asia north of 40° N latitude and into the southern Bering Sea. Although the species' stock structure is poorly known, there appear to be at least two distinct populations—one in the eastern North Pacific that feeds in summer months primarily off Alaska in the eastern Bering Sea and Gulf of Alaska, and another in the western North Pacific that uses feeding grounds off Russia in the Okhotsk Seas and western Bering Sea.

North Pacific right whales gained a respite from most whaling from the mid-1900s under an international ban on hunting adopted by the League of Nations in 1935. That ban has been carried forward under the International Whaling Commission since 1949. In the late 1960s, however, the remnant eastern population was devastated by an illegal catch of almost 400 whales, a take that did not come to light until the late 1990s. The eastern population may now number fewer than 50 individuals. The location or locations of calving grounds remain unknown.

Between the late 1960s and the mid-1990s right whales in the eastern North Pacific were known only from rare sightings of individuals or pairs scattered from Baja California, Mexico, to Hawaii and Alaska. In 1996 a group of four whales was found feeding in the eastern Bering Sea. Every summer since then, surveys by National Marine Fisheries Service researchers have found at least a few right whales in the same area. Several sightings also have been made in the Gulf of Alaska south of Kodiak Island. Together, those sightings have enabled the identification of at least 23 individuals, including three cow/calf pairs. Many of those individuals have been resighted in different years, and about two-thirds of the identified individuals are males.

The National Marine Fisheries Service has lead responsibility for the recovery of North Pacific right whales. As discussed here, during 2006 the Service designated critical habitat for

North Pacific right whales and took steps to update the species' listing under the Endangered Species Act.

Designation of North Pacific Right Whale Critical Habitat

In 2000 the Center for Biological Diversity petitioned the National Marine Fisheries Service under provisions of the Endangered Species Act to designate a large part of the eastern Bering Sea as critical habitat for North Pacific right whales. Such designations identify areas where federal agencies must consult with the Service if activities they might conduct or permit could jeopardize the species' continued existence or destroy or adversely modify its critical habitat. The petition was prompted by the recent annual summer sightings of right whales and historical whaling records, and it identified the outer one-third of the continental shelf in the eastern Bering Sea as critical. The Service found that the petitioned action may be warranted and requested public comments in 2001. On 11 July 2001 the Commission commented in support of the action, but in 2002 the Service decided against designation, stating that information was insufficient to identify the essential biological features that made the area critical for right whales.

The Center subsequently filed a lawsuit asserting that failure to designate critical habitat violated requirements of the Endangered Species Act. A district court judge agreed and ordered the Service to publish a critical habitat proposal. On 2 November 2005 the Service published a request for comments on a proposal to designate two areas that circumscribed the locations where most right whale sightings had occurred since the species was listed as endangered in the early 1970s (Figure 8). The two areas included a large area over a portion of the continental shelf in the eastern Bering Sea and a smaller area south of Kodiak Island in the Gulf of Alaska.

On 3 January 2006 the Commission responded to the Service's request for comments.

The Commission noted that, given historical catch data from commercial whaling records, the locations of recent sightings clearly underrepresent the species' distribution and its critical habitats. It therefore recommended that the Service take into account habitat needed to promote recovery, including areas that may currently be unoccupied by the remnant population but important for future growth. It recommended that the Service review sighting and catch data for North Pacific right whales over the past century and designate critical habitat in those areas where reported whale concentrations overlap with currently known areas of prey concentration or, alternatively, where historical catch records suggest that areas have served as important feeding grounds. Historical whaling records also indicate that right whales migrated seasonally between the Bering Sea and the northern North Pacific. The Commission therefore recommended that the Service include gaps between the Aleutian Islands from Unimak Pass to Umnak Pass in its critical habitat designation. Finally, recognizing the need for better data on eastern North Pacific right whale distribution and movements, the Commission recommended that the Service conduct research to assess habitat-use patterns, including habitat used for breeding and calving. The Commission also recommended that the Service extend its scientific research on this population to include stock structure, abundance, age and sex composition, condition, and factors that may be impeding recovery.

On 6 July 2006 the National Marine Fisheries Service published a final rule designating the two areas in its original proposal as critical habitat. The Service stated that regulations allow designating critical habitat in unoccupied areas only when a designation of a species' present range would be inadequate to ensure its conservation. In this regard, it stated that it found no information to support designation in areas not documented to be used by right whales and that, in the absence of recent sightings in other areas, it believed that information

was insufficient to conclude that essential habitat features (e.g., concentrations of prey necessary to support right whales) were present in other areas. It also stated that many commercial whaling records did not provide information on the numbers of whales present at the time of the sighting or harvest and therefore were not adequate to identify critical habitat.

With regard to the Commission's recommendation that critical habitat be designated to include Aleutian Island passes that the whales use for transiting between the North Pacific and Bering Sea, the Service noted that right whales likely used those areas as travel corridors, but that information was not sufficient to document which passes were used. The Service also noted that it might revise the critical habitat designation as new information becomes available and that it would continue to conduct and

encourage research on right whale habitat-use patterns. Noting that recent telemetry studies had helped locate the largest group of right whales seen since the 1960s, the Service concluded that further studies to track right whale movements were a high priority but that it had no immediate plans to continue such studies.

Status of North Pacific Right Whales under the Endangered Species Act

As noted in the section on North Atlantic right whales, right whales in the North Atlantic and North Pacific Oceans have been listed under the Endangered Species Act as part of a single species called the northern right whale. Recent genetic studies, however, clearly demonstrate that right whales in the two ocean basins are separate species. To reflect this new understanding, the National Marine Fisher-

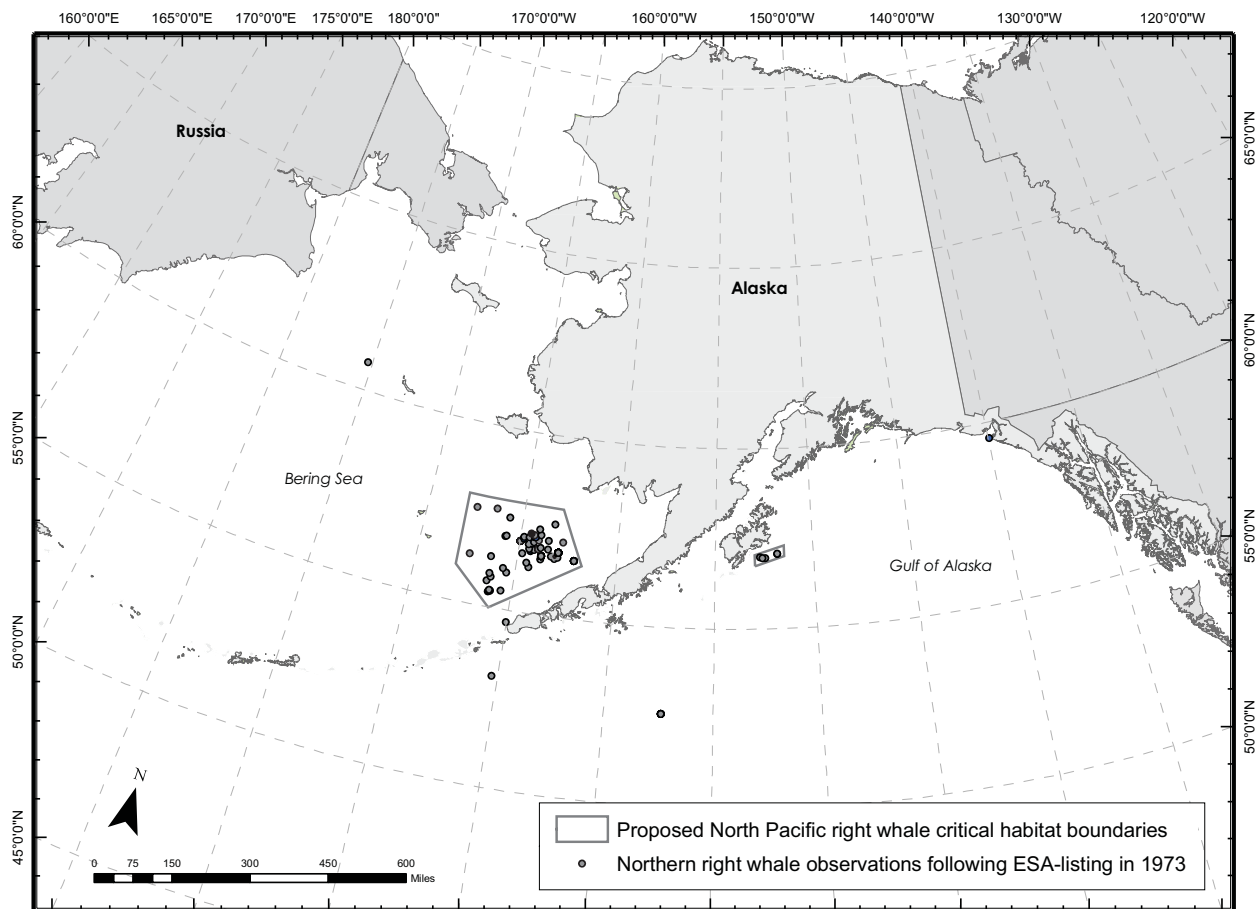


Figure 8. National Marine Fisheries Service's proposed critical habitat for North Pacific right whales.

ies Service published proposed rules on 27 December 2006 to replace the current listing for northern right whales in the official List of Endangered and Threatened Species with separate listings for North Pacific right whales (*Eubalaena japonica*) and North Atlantic right whales (*E. glacialis*). The proposed rules would list both species as endangered and clarify the importance of pursuing separate recovery programs for each.

Southern Resident Killer Whales (*Orcinus orca*)

Three ecotypes of killer whales inhabit the North Pacific. They are distinguishable on the basis of their genetics, acoustics, foraging patterns, and prey. They also differ in home range size and movement patterns and have been named accordingly as resident, transient, and offshore ecotypes. Killer whales of the resident ecotype have the smallest home ranges and generally spend part of each year in predictable locations. Existing information indicates that in the North Pacific resident killer whales prey on fish and transients prey on marine mammals. The diet of offshore whales is unknown.

The National Marine Fisheries Service recognizes three stocks of resident killer whales in the North Pacific: the southern resident stock (observed primarily in Washington and southern British Columbia), the northern resident stock (observed primarily in central and northern British Columbia), and the Alaska resident stock (observed from southeastern Alaska to the Aleutian Islands and the Bering Sea). These resident stocks are composed of pods of genetically related whales that, in turn, are composed of smaller, more closely related matrilineal groups. Matrilines generally consist of a matriarch, her male and female offspring, and the offspring of those females; they have been known to include up to 17 animals and span up to four generations. Pods comprise groups of related matrilines, which tend to as-

sociate with each other rather than matrilines from other pods. The southern resident stock of killer whales is composed of three separate pods (J, K, and L pods) and a total of 20 matrilines (4 J, 4 K, and 12 L).

Population Trends

Historically, southern resident killer whales are thought to have numbered more than 200 individuals. Since 1960, however, the southern resident stock has never exceeded 100 individuals (Figure 9). In the late 1960s and early 1970s, an estimated 47 or 48 killer whales were taken from the southern resident stock for display and research. Most of those animals were immature, and their removal reduced the stock to an estimated 70 animals in 1976. Over the next two decades, the population recovered partially from the loss of those animals to a total of 99 animals in 1995. Since then, the stock first declined to 79 animals in 2001 and then increased to 91 animals in 2005. These trends primarily reflect changes in the number of animals in L pod, the largest of the three southern resident pods. The most recent increase, however, reflected an increase primarily in J and K pods. These pod-specific trends are important because males rarely mate with females from their own pod (and resident killer whales only mate within their ecotype in the North Pacific). As a result, the reproductive success of one resident pod is determined not only by the fecundity of females within that pod but also by the availability of fertile males from other resident pods. Thus, although L pod is the largest pod, its reproductive success may be limited by the availability of fertile males in J and K pods.

Threats

Three factors have been identified as possibly contributing to the failure of southern resident killer whales to recover to their historic abundance: high contaminant loads; disturbance by whale-watching boats and other vessels; and declines in available prey, particularly salmon. Southern resident killer whales and

transient killer whales in the North Pacific are among the most contaminated marine mammals in the world, particularly with regard to pollutants such as PCBs and polybrominated diphenyl esters (PBDEs, a relatively new group of compounds in flame-retardant materials). Transient killer whales feed on marine mammals and thus are at a higher trophic level than resident killer whales and more likely to have high contaminant levels in their tissues. Although southern resident killer whales feed on fish, they have contaminant levels approaching those of transients and much higher than other resident populations in the North Pacific. Such high contaminant levels may compromise reproduction and immune system function. The levels of PCBs in southern resident killer whales exceed thresholds thought to cause immune system dysfunction in seals.

Southern resident killer whales also may be significantly affected by whale-watching and other human activities that adversely modify the essential features of killer whale habitat or directly disturb the animals and disrupt their behavior. Excessive contact with whale-watchers, for example, may disrupt foraging, resting, or other behavior and cause killer whales to shift their habitat-use patterns. Noise associated with whale-watching or other vessels may not only disturb the animals but also may increase ambient noise levels to the extent that it interferes with or masks killer whale sounds used for foraging, communication, or other purposes. Particularly loud sounds produced during some commercial (e.g., seismic surveys) and military (e.g., tactical sonar) operations also may disturb animals and, in some cases, could cause injuries.

The failure of southern resident killer whales to recover also may be due, at least in part, to a decline in the availability of their prey. These whales depend heavily on salmon and perhaps on specific salmon runs. The majority of salmon runs throughout the Pacific Northwest are much smaller than they were historically, which suggests that the current carrying

capacity for resident killer whales may be lower than it was in the mid-1900s. In recent decades, overall salmon abundance in the Puget Sound region has been roughly stable if hatchery-produced salmon are included. Southern resident killer whales, however, appear to specialize on chinook salmon; thus, mortality rates of southern resident killer whales are correlated with chinook salmon abundance.

In addition to previously mentioned factors, the small population size of southern resident killer whales makes them especially vulnerable to catastrophes such as disease epidemics or oil spills. The AT1 transient killer whale stock in Alaska had only 22 members in the 1980s but seemed stable at that time. However, 40 percent of the population was lost during the months and years immediately following the *Exxon Valdez* oil spill in 1989, and the stock may never recover from the effects of that catastrophe.

Legal Status, Critical Habitat and Recovery Planning

Following a petition by the Center for Biological Diversity and two status reviews, the National Marine Fisheries Service designated southern resident killer whales as depleted under the Marine Mammal Protection Act in 2003 and as endangered under the Endangered Species Act in 2005. (For more information, see the Commission's Annual Report to Congress for 2005.) On 15 June 2006 the Service published a proposed rule to designate critical habitat for southern resident killer whales. In the proposed rule, the Service identified the primary constituent elements of southern resident killer whale critical habitat as (1) water quality to support growth and development; (2) prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth; and (3) passage conditions to allow for migration, resting, and foraging. The Service further identified three geographic areas of critical habitat: (1) a core summer area in the waters surrounding the San Juan Islands, (2)

Puget Sound from Deception Pass south to the entrance of Admiralty Inlet, and (3) the Strait of Juan de Fuca. These areas of critical habitat include essentially all of the inland waters off northwestern Washington, with the exception of nearshore waters less than 20 feet deep, Hood Canal (where resident killer whales have not been observed for more than 20 years), and 18 military sites that were excluded because of likely deleterious effects on military readiness, which were deemed to outweigh the potential conservation benefits of designating those 18 sites as critical habitat.

The Commission reviewed the critical habitat proposal and in a 2 March 2007 letter to the Service recommended that it (1) recognize natural sound characteristics as a primary constituent element of southern resident killer whale critical habitat; (2) investigate all potential connections between sources of sound disturbance and actions authorized, funded, or carried out by the federal government to determine if a nexus exists, thereby allowing the Service to avail itself of all conservation tools

under the Endangered Species Act, particularly section 7 consultations; (3) implement a precautionary approach with regard to management of contaminants to prevent them from entering the Puget Sound environment; (4) designate critical habitat for the southern resident killer whale stock up to the shoreline, rather than limit it to waters more than 20 feet deep; and (5) initiate an investigation of winter habitat use by southern resident killer whales as soon as possible. The Commission also encouraged the Service to work with the Navy to monitor activities in the excluded areas and advise the Navy of steps that should be taken to minimize potential destruction or adverse modification of killer whale habitat.

The Service published a final rule designating critical habitat on 29 November 2006. The final rule was essentially unchanged from the proposed rule. The Service did not include sound as a primary constituent element of southern resident killer whale critical habitat, arguing that observations of sound effects on killer whales represented direct effects

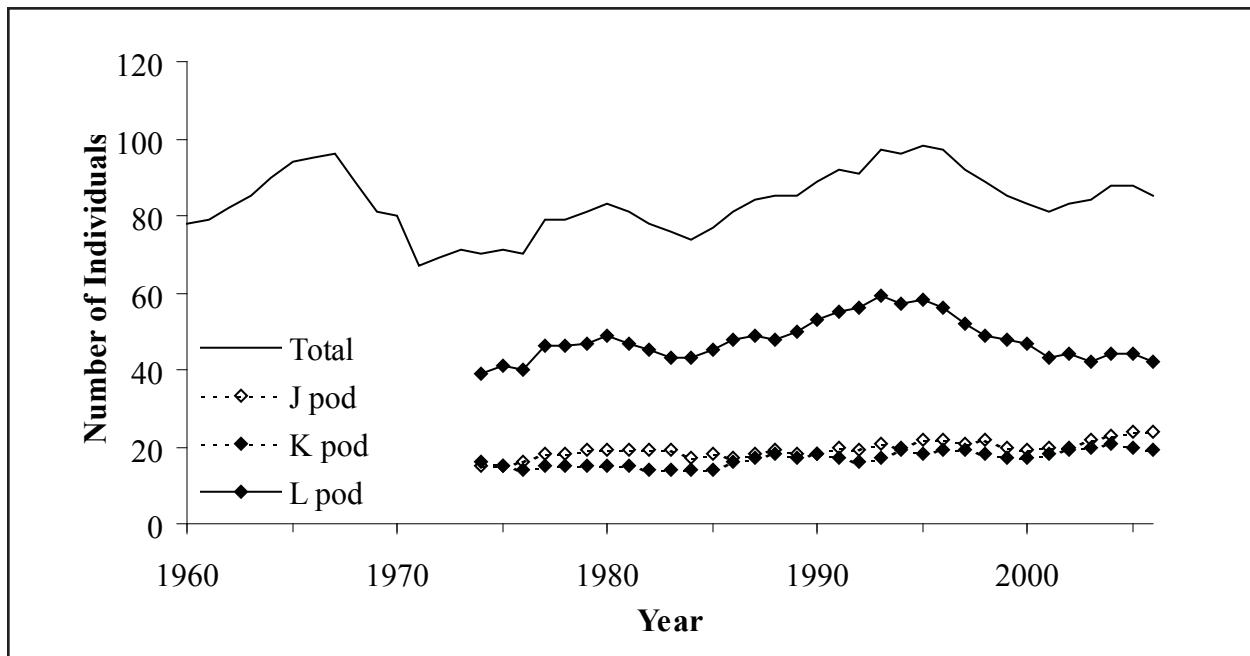


Figure 9. Southern resident killer whale abundance from 1974 to 2006 based on the number of whales present in each pod at the end of a calendar year. Data courtesy of the National Marine Fisheries Service and the Center for Whale Research.

on the animals and not on their habitat. The Service conceded that continuous sounds may interfere with whales' echolocation and communication but contended that insufficient information was available to include sound as a primary constituent element of southern resident killer whale critical habitat. The Service also did not extend critical habitat up to the shoreline; rather it limited critical habitat to waters deeper than 20 feet. The Service acknowledged that transient killer whales are known to beach themselves to attack marine mammals and that northern resident killer whales are known to use shallow areas as "rubbing" beaches, but the Service indicated that the few observations of southern resident killer whales using shallow waters were not confirmed (i.e., it was not clear that the observations in fact were from waters less than 20 feet deep), nor were they sufficient to consider such shallow waters to be occupied by southern resident killer whales.

Also on 29 November 2006 the Service published a proposed recovery plan for southern resident killer whales. The plan considered a variety of threats facing the whales, including diminished prey availability, pollution and contaminants, vessel effects, oil spills, and acoustic effects (i.e., anthropogenic sounds). The recovery criteria are based both on addressing the known threats and evidence of recovery based on population dynamics. In particular, the biological recovery criteria are based on population viability analysis of southern resident killer whales, which indicated an apparent 14-year cycle in the variation of survival rates, with approximately seven years of high survival followed by seven years of low survival. The biological criteria require sustained population growth (average of 2.3 percent per year) over a full 14-year cycle for downlisting and over two full cycles (28 years) for delisting. The biological criteria also require that the demography of the population (e.g., sex and age distribution and age-specific reproductive and survival rates) be consistent

with a growing or stable population. At the end of 2006 the Commission was reviewing the draft recovery plan.

Northern Sea Otter, Southwest Alaska Stock *(Enhydra lutris kenyoni)*

Sea otters (*Enhydra lutris*) once occupied coastal waters more or less continuously along the North Pacific rim from central Baja California to northern Japan. In Alaska, sea otters (*E. l. kenyoni*) were abundant prior to the establishment of the fur trade in the mid-1700s. Overharvesting of the vulnerable and valuable otters caused a severe reduction in their abundance, to the point that, when protection was afforded them by the Fur Seal Act in 1911, only a few small remnant groups remained. With protection, the species rebounded; by the 1980s sea otters had reoccupied much of their previous range in Alaska and had reached what were thought to be equilibrium densities in some regions.

Sea otters are under the jurisdiction of the U.S. Fish and Wildlife Service, and in Alaska they are managed as three stocks occurring in Southeast Alaska, Southcentral Alaska, and Southwest Alaska. According to the most recent (2002) stock assessment reports prepared by the Service, the Southeast Alaska stock is growing and expanding its range, and the overall trend for the Southcentral stock is stable or slightly increasing. However, the Southwest Alaska stock has recently undergone a major decline.

The Southwest Alaska stock includes sea otters within the region from Kamishak Bay and Kodiak Island in the east to Attu Island in the west. Within that overall area, otters occupy waters along the mainland and offshore islands of the Alaska Peninsula, all of the Aleutian Islands, and the southern and eastern parts of Bristol Bay. Because they are benthic feeders with limited diving capabilities, they usually stay relatively close to shore, except in shallow areas such as Bristol Bay.

The Decline of the Southwest Alaska Sea Otter Stock and its Causes

Although the entire range of the southwest Alaska sea otter stock was surveyed prior to its recent decline, those surveys used a number of different methods and were of variable quality. Nonetheless, the best estimate is that there were 94,050 to 128,650 otters in the region in 1976. Based on a recent analysis of survey data from Kodiak Island, the overall abundance estimate for the Southwest stock is 47,676, which indicates an overall decline of 49 to 63 percent (Table 7). The decline has not been evenly distributed throughout the stock's range. The estimated degree of decline exceeds 70 percent in the western Aleutians and southern Alaska Peninsula areas, while abundance at Kodiak Island appears to be stable. On a smaller scale, otters may have completely disappeared from some small rocky islands in the Aleutians where they previously were common.

The animals in this stock do not exhibit evidence of food limitation, abnormal levels of disease (but see later discussion), effects of contaminants, or reduced reproduction. Only small numbers are killed in fishing gear or taken by Alaska Native subsistence hunters. The leading hypothesis to explain the decline, at least in the central and western Aleutian Islands region, is predation by killer whales. Support for the predation hypothesis comes from observations of killer whales interacting with otters, changes in otter distribution and behavior, the fact that otters have not disappeared from refugia that killer whales cannot enter, and calculations indicating that the decline could be caused by a small number of killer whales preying on otters. One related hypothesis suggests that removal of about 500,000 large whales in the Bering Sea and the North Pacific from the 1950s to 1970s reduced the prey available to killer whales, which then changed their foraging patterns and sequentially depleted harbor seals, Steller sea lions,

northern fur seals, and sea otters. The hypothesis that killer whales have caused the decline of sea otters in the central Aleutian Islands is reasonably well supported, but the link to whaling is both speculative and controversial. The issue currently is being examined by the Marine Mammal Commission (see Chapter IV for a discussion of the Commission's special project on the ecology of killer whales) and will be summarized in a report to Congress.

Endangered Species Act Listing of the Southwest Alaska Sea Otter Stock

In 2001 the Center for Biological Diversity petitioned the Fish and Wildlife Service to list Alaska sea otters as depleted under the Marine Mammal Protection Act. That petition was denied on the grounds that substantial information was not provided to warrant the petitioned action and that the best estimate of population size for the entire Alaska sea otter population considerably exceeded the number presented in the Center's petition. The Service recognized, however, that the best available evidence indicated that sea otters in Alaska comprise at least three separate stocks, and in 2002 the Service revised its sea otter assessment reports accordingly. Based on information obtained from additional surveys, on 11 February 2004 the Service proposed to list the Southwest Alaska distinct population segment as threatened under the Endangered Species Act. That listing was finalized on 9 August 2005. The listing notice included an analysis of the Act's five listing factors, which concluded that the only identifiable threats to the population were predation by killer whales and contaminants, particularly a large oil spill that could affect the remaining population. In the final rule, the Service did not designate critical habitat and stated that although designation of critical habitat may be prudent, it was unable at that time to determine the physical and biological features essential to conservation of the distinct population segment.

Current Management and Research Actions and Issues

Rulemaking on Subsistence Uses: With the listing of the Southwest Alaska stock as threatened, inconsistencies between the Marine Mammal Protection Act and the Endangered Species Act came to light regarding the export of handicrafts legally created by Alaska Natives and with the import and export of handicraft items used as part of cultural exchanges with Canada and Russia. On 15 August 2006 the Service finalized a special rule under section 4(d) of the Endangered Species Act that allows such limited noncommercial imports and exports and also amends the definition of authentic Native articles of handicraft and clothing to eliminate the requirement that such items were commonly produced on or before 28 December 1973.

Recovery Team and Recovery Plan: In February 2006 the Service established a recovery team for the Southwest Alaska sea otter stock. The terms of reference for the team indicate that it is “to advise the Regional Director on issues concerning the conservation and recovery of the threatened DPS [distinct population segment], particularly with regard to development of a recovery plan.” The team includes an agency lead, a chair, and 13 additional mem-

bers representing scientific expertise and stakeholders. The team held its first two meetings in March and October 2006. Primary activities at those meetings have been to discuss factors that could be impeding recovery of the stock and ongoing research and management actions needed to address those factors, and to work on a draft recovery plan. Subsequent to its October meeting, the team sent a letter to the Service’s Regional Director recommending that the Service (1) conduct certain studies relative to an ongoing unusual mortality event in the eastern part of the stock’s range; (2) obtain base funding adequate to monitor abundance of otters; and (3) conduct certain studies to prepare for the review, evaluation, and possible designation of critical habitat (see following discussion). Additional information on the recovery team and its activities can be found at <http://alaska.fws.gov/fisheries/mmm/seaotters/recovery.htm>.

Critical Habitat Designation: As noted previously, when Southwest Alaska sea otters were listed as threatened, the Service did not establish critical habitat. On 3 October 2006 the Center for Biological Diversity submitted a 60-day notice of intent to file suit against the Service for failure to designate critical habitat

Table 7. Recent sea otter abundance estimates for the southwest Alaska stock

Region	Year of Most Recent Count	Estimated Abundance	Population Change From Earliest Estimate
Western Aleutian Islands	2000	6,250	-73 percent
Eastern Aleutian Islands	2000	2,492	-55 percent
Bristol Bay	2000	11,253	-39 percent
Southern Alaska Peninsula	2001	4,724	-74 percent
Kodiak Island, Kamishak Bay, and Alaska Peninsula	2001 & 2004	22,957	Relatively stable
Overall for Southwest Alaska		47,676	-49 to -63 percent

Unpublished data courtesy of U.S. Fish and Wildlife Service.

within one year of listing. Such a suit was filed on 19 December 2006. At the end of 2006 the Service was anticipating that it would work with the Center to settle the lawsuit.

Unusual Mortality Event: Beginning in 2004 and continuing through 2006, Service biologists working with the Alaska Marine Mammal Stranding Network detected an elevated number of sea otter carcasses in the area between Umnak Island and Kachemak Bay. Although much of this region overlaps the Southwest Alaska sea otter range, most of the carcasses have been found in Kachemak Bay located just to the east of the boundary between the Southwest and Southcentral Alaska stock ranges. Unusual features of this event were that in 63 of 147 cases the cause of death was diagnosed as *Streptococcus bovis* endocarditis/septicemia, and of those cases 72 percent were male and 44 percent were prime-age adults. The Service consulted with the Working Group on Marine Mammal Unusual Mortality Events, and on 24 August 2006 the working group officially declared the event to be an unusual mortality event. The Service has continued to collect and necropsy carcasses in that region and to have samples analyzed. In its 6 December 2006 letter to the Service, the recovery team recommended that the Service (1) conduct a program to live-capture and sample sea otters both within and adjacent to the core mortality event area, and (2) conduct abundance surveys throughout the affected area to determine if the mortality is having a population-level effect.

Funding for Research and Recovery Efforts: The Service's Marine Mammals Management Office and the U.S. Geological Survey's Biological Resource Division have been responsible for most of the management and research relative to sea otters in Alaska. Base funds in these two agencies have allowed a certain amount of basic population assessment and ecological research, but they have been far from adequate to deal with the need to clearly understand factors limiting the Southwest Alaska distinct population segment and to

take actions needed to enable recovery of the stock. Beginning in 2003 the Alaska SeaLife Center began to receive congressionally earmarked funds through the Service to work on sea otter research and recovery. Amounts transferred to the Center were \$663,000 in FY2005 and \$585,489 in FY2006. Those funds have been used for a variety of efforts, including support of recovery team meetings, planning and conducting workshops, investigating killer whale predation, continuing ecological research at long-term study sites in the Aleutian Islands, and initiating ecological studies in the Commander Islands. In addition, the Alaska Sea Otter and Steller Sea Lion Commission has received support through section 119 of the Marine Mammal Protection Act to conduct a number of studies, including surveys of traditional and local ecological knowledge, biosampling of harvested otters, and small-boat surveys to investigate sea otter abundance and trends in local areas. As of the end of 2006 the funding situation for Southwest Alaska sea otter research and recovery efforts in the coming year was uncertain.

Steller Sea Lion

(Eumetopias jubatus)

As discussed in the Commission's past annual reports, the western stock of Steller sea lions (*Eumetopias jubatus*), which occurs from the central Gulf of Alaska through the Aleutian Islands, has declined sharply over the past three decades. Because separate stocks were not recognized until 1997, the entire species was listed as threatened under the Endangered Species Act in 1990. In 1997 the National Marine Fisheries Service recognized separate western and eastern stocks, changed the listing status of the western stock to endangered, and left unchanged the status of the eastern stock as threatened. The eastern stock of Steller sea lions occurs from California through Southeast Alaska, and its abundance has steadily increased at about 2 to 3 percent annually over

the past three decades, exhibiting recovery from high levels of human-related mortality in the years prior to the passage of the Marine Mammal Protection Act.

As also discussed in past annual reports, the decline of the western stock and attribution of its causes have been highly controversial. A number of factors contributed to the decline, including bycatch in commercial fisheries, illegal shooting by fishermen and others, the intentional killing of 45,000 pups for their fur between the mid-1960s and the early 1970s, and subsistence harvests by Alaska Natives. However, these factors explain only a portion of the decline, and the debate over other possible causes has been intense. The leading hypotheses include competition with groundfish fisheries in the Gulf of Alaska and the Bering Sea, large-scale oceanographic changes or regime shifts, and predation by killer whales (see Chapter IV). Because of the potential involvement of commercial fisheries, and the potential for regulatory constraints on fisheries, research on the decline of the Steller sea lion has received more funding in recent years than that for all other endangered marine mammal species combined. Funding increased from about \$3 million in 1998 to as much as \$56 million in 2002 and 2003, with

reduced levels in subsequent years. Not all of these funds were directed toward research, and a good portion of them were passed through the National Marine Fisheries Service to other organizations for a variety of purposes. The Service mounted an intense effort to distribute those funds over which it had discretion, and a wide range of research was conducted both on Steller sea lions and their ecosystem. Despite that research, the controversy over potential causes of the decline persist. Counts after 2000 suggest that the western stock has stabilized and may have experienced a small amount of recovery. Additional counts are needed to confirm the current trend.

To guide recovery efforts for the Steller sea lion, the National Marine Fisheries Service first completed a recovery plan in 1991. That plan became outdated over the course of the next decade, particularly with the recognition of two stocks and relisting of the western stock. In response, the Service convened a new recovery team in 2001. The new team consisted of scientists from agencies and organizations conducting research on Steller sea lions and the Bering Sea and Gulf of Alaska ecosystems, as well as representatives of the fishing industry, conservation organizations, and the state of Alaska. After five years of debate, writing, and rewriting, the team completed the draft revised recovery plan in 2006.

On 24 May 2006 the Service announced the availability of the draft revised recovery plan in the *Federal Register* and solicited comments on it. The plan identified subsistence hunting, illegal shooting, entanglement in debris, disease, and disturbance from vessel traffic and scientific research as minor threats; contaminants and incidental take in fisheries as



Figure 10. A Steller sea lion rookery in Alaska. Photo by Captain Bud Christman, NOAA Corps.

moderate threats; and competition with fisheries, oceanographic changes, and predation by killer whales as potentially high threats. The plan identified a total of 78 different recovery actions that emphasized assessment of status and vital rates, investigation of remaining threats, and corresponding implementation of conservation measures. The plan highlighted three conservation issues as being of particular importance: (1) maintaining current fishery management measures, (2) conducting an adaptive management approach to investigate fishery effects and the efficacy of fishery management measures, and (3) continued monitoring of sea lion status and investigation of threats. The plan also set forth the following measures of recovery of the western stock: (1) statistically significant growth of the non-pup portion of the population for at least 15 years, (2) vital rates consistent with a growing population, (3) positive growth of sea lion numbers in at least five of the seven regions occupied by the western stock in U.S. waters, and (4) sufficient recovery as judged on the basis of the five listing factors in the Endangered Species Act. The plan recommended initiation of a status review for the eastern stock because, based on the criteria in the plan, this stock appears to no longer warrant listing.

On 31 August 2006 the Marine Mammal Commission wrote to the Service commenting on the draft revised plan. The Commission commended the recovery team for its work and concurred with the major focus and recommendations of the plan. To further strengthen recovery efforts, the Commission also made three recommendations to the Service. The first was that the Service reconsider its recovery criteria. In the course of preparing the draft revised plan, the recovery team worked with an independent scientist to develop a model approach for determining recovery criteria. The benefits of the modeling approach were that it took into account all relevant data on these stocks, including the extreme variation in trends of the western population and uncertainty in the

causes of that variation. In view of the fact that much of the past decline in the western stock has not been explained, it appears prudent to recognize and incorporate that type and degree of uncertainty in developing recovery goals.

The second recommendation was that the Service develop and implement a rigorous, adaptive management approach for investigating the role of fisheries in the decline of the western stock and its potential significance in current and future recovery efforts. The debate over potential fishery effects has generated considerable controversy on questions that are difficult to address without an adaptive research program that can manipulate the fishery to determine its effects.

The Commission's third recommendation was that the Service convene an implementation team to advise it on implementation and coordination of research efforts. Such guidance would not only facilitate the best possible research but also lend credibility to the research program by virtue of the independence of the implementation. In addition, the implementation team could assist the Service in the development of research methods to investigate the effect of research itself on the western stock, an issue that has become controversial.

Steller Sea Lion Research Permits and Possible Effects

The rapid increase in research funds in 2001 caused a substantial increase in the number and complexity of permit applications for Steller sea lion research without a corresponding increase in funding for the National Marine Fisheries Service office responsible for processing those permits. In 2002 the Service issued several permits based on the conclusion of an environmental assessment prepared under the National Environmental Policy Act that the multiple research projects proposed to be conducted through 2004 would not have a significant impact on Steller sea lions. In May 2005 the Service issued several new permits for additional research, including continuation

of some of the previous studies. In a series of letters to the Service dating back to 2001 (27 July 2001, 2 August 2002, 19 May 2005, and 10 June 2005), the Commission expressed concern that the growth in research activities being undertaken by a wide range of investigators for a number of different purposes increased the potential for adverse effects from research itself, regardless of the good intentions of the researchers seeking to provide information that may promote Steller sea lion recovery. Despite these concerns, the Service issued the six requested scientific research permits authorizing virtually all of the proposed research activities. In response, the Humane Society of the United States filed a lawsuit challenging the issuance of these permits, citing concerns similar to those raised by the Commission and others who had commented on the applications. In response to the issues raised in the lawsuit, the Service published a notice in the *Federal Register* on 28 December 2005 announcing its intent to prepare an environmental impact statement to evaluate the impacts of issuing Steller sea lion research permits, including the cumulative impacts of authorizing multiple studies.

On 26 May 2006 the U.S. District Court for the District of Columbia found in favor of the Humane Society and vacated the permits that had been issued a year before. The court also ordered the National Marine Fisheries Service to prepare an environmental impact statement, which the Service had already committed to do, analyzing whether the research will have a significant impact on the environment. In June 2006 the Service and the Humane Society reached a settlement under which the Service and other permit-holders were allowed to conduct non-invasive research (e.g., observations of tagged and branded animals). The delay in reaching that settlement disrupted a number of research activities, including surveys to assess population trends. The intent of the lawsuit, as described by the plaintiffs, was not to disrupt research but rather to ensure that it was well directed, coordinated, and conducted to provide

essential information without contributing to the sea lion decline through unintended adverse effects. At the end of 2006 the Service was in the process of preparing the environmental impact statement in hopes of completing it and considering new permit applications in time to authorize a full suite of research activities during the 2007 field season. The environmental impact statement also was expected to address the issuance of northern fur seal research permits in anticipation of possible increases in research funding and permit requests for that species.

Hawaiian Monk Seal *(Monachus schauinslandi)*

The Hawaiian monk seal, one of the world's most endangered seals, breeds only in the Hawaiian archipelago. More than 90 percent of all Hawaiian monk seals occur at six relatively independent breeding colonies located in the remote, largely uninhabited atolls and islets of the Northwestern Hawaiian Islands (NWHI) (Figure 11) Monk seals apparently were extirpated from the main Hawaiian Islands sometime after the first Polynesians arrived about 2,000 years ago. Over the past several decades, however, a small but growing number of seals have begun to reoccupy the main islands. Since the first surveys of Hawaiian monk seals late in the 1950s, mean beach counts at the six major pupping colonies in the NWHI have declined by more than 60 percent. Approximately 1,100 animals now survive in the wild in the NWHI.

Reasons for the species' decline have varied over time and between breeding colonies. In the 1800s commercial sealing and subsistence hunting by visiting and shipwrecked sailors and bird hunters caused large declines throughout the NWHI. The species apparently recovered to an unknown extent in the early 1900s after President Theodore Roosevelt set aside most of the NWHI as a wildlife sanctuary to prevent the slaughter of bird populations by plume hunters supplying the millinery trade. However, several NWHI atolls also were occupied year-round or

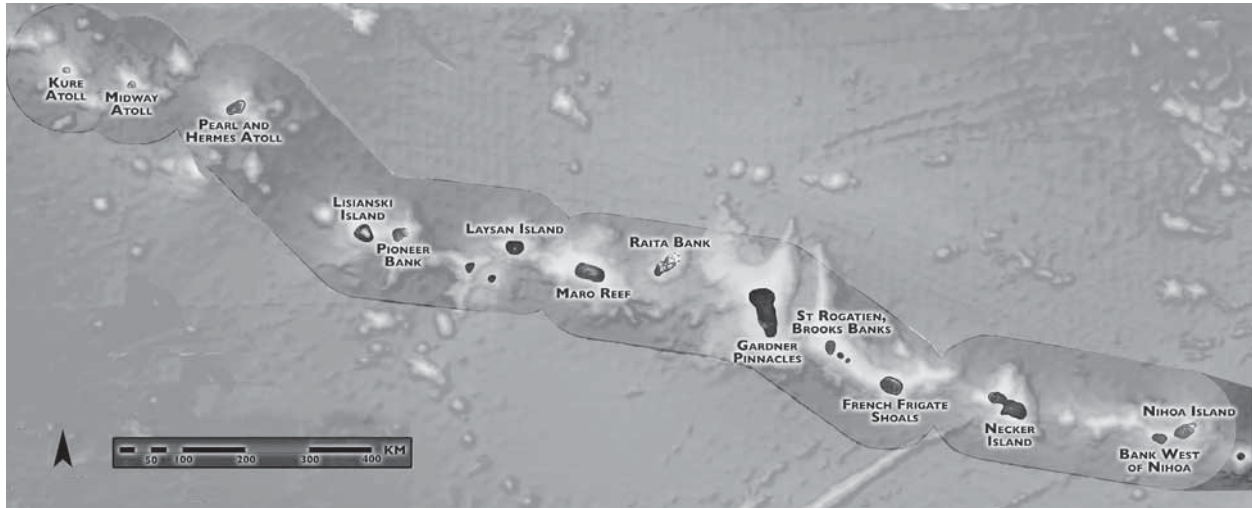


Figure 11. The Northwestern Hawaiian Islands. Original image courtesy of Aurelie Shapiro et al., NOAA National Ocean Service.

visited for various lengths of time by poachers, fishermen, and others throughout the 1900s. From the 1930s to the end of the twentieth century, the principal year-round residents were Navy and Coast Guard personnel and support staff stationed at Midway Atoll, Kure Atoll, and French Frigate Shoals. The result was chronic disturbance that caused seals to abandon beaches and nearshore habitat. Such displacement increases the likelihood of shark predation (particularly for pups and juveniles) and disrupts behaviors important for survival (e.g., resting, molting, and pupping). For these and other reasons, population abundance at most breeding sites has been declining since at least the 1950s. In contrast, reductions in disturbance at French Frigate Shoals allowed that population to recover, and by the mid-1980s, about half of the total monk seal population occurred at that site.

Annual studies of the Hawaiian monk seal were initiated in the late 1970s. By the early 1980s the western populations (those at Kure, Midway, and Pearl and Hermes Reef) were severely depleted, but disturbance was being brought under control, leading to optimism that recovery at those sites could be accomplished with suitable conservation measures. At Kure, on-site “headstart” and remote captive care programs were begun to enhance survival of weaned female pups. Additional recovery

efforts were focused on the Laysan and Lisianski Islands populations, where imbalanced male-to-female sex ratios and adult male aggression caused unsustainable mortality of adult and juvenile females.

In the 1990s beach counts suggested that the overall population had stabilized. However, juvenile survival had begun to plummet sharply at French Frigate Shoals in the late 1980s, and later at other sites, and the apparent population stability belied the major changes occurring in the population age structure. By the end of the 1990s population numbers began to decline again. Years of poor juvenile survival and almost no recruitment of breeding-age females had severely undermined the reproductive capacity of the total population, and from 1998 to 2006 the overall abundance in the NWHI declined at an average annual rate of 3.9 percent.

Factors that may be perpetuating the current decline include starvation due to poor foraging conditions that could reflect oceanographic changes, effects of previous fishing, competition among seals at some sites, and competition with other high-level predators; entanglement in marine debris (principally trawl nets drifting into the Hawaiian archipelago from around the North Pacific Ocean); shark predation; aggressive behavior by adult male seals toward pups, juveniles, and adult females; periodic outbreaks

of naturally occurring biotoxins; and the loss of some preferred pupping beaches on low-lying islets due to erosion, perhaps reflecting a rising sea level. Juveniles are especially vulnerable to most of these threats and, as in the past, poor juvenile survival continues to characterize declines at most colonies. At their current rate of decline, the number of monk seals is expected to drop below 1,000 animals in the next few years.

Research and Management Activities

Over the past 25 years, the National Marine Fisheries Service, the lead agency responsible for Hawaiian monk seal conservation, has developed a well-designed monk seal research program and implemented various management initiatives that have undoubtedly helped slow the species' decline. As discussed in previous annual reports, the Marine Mammal Commission has directed a high level of attention to the species' recovery through advice and assistance to the Service, as well as other involved agencies and groups.

Research and Monitoring: Among the Service's most noteworthy accomplishments relative to monk seals has been the development of an intensive, well-conceived research and monitoring program. Annual field camps deployed to all major NWHI breeding colonies during the peak of the pupping season in spring and summer have enabled researchers to tag and monitor the life history (e.g., survival and reproduction) and condition of most individual seals. The collected data also have enabled the identification and assessment of sources of injury and mortality, such as starvation, entanglement in marine debris, interactions with commercial fishing gear, aggressive behavior by certain adult males, and shark predation. Based on that information, field teams have developed and implemented various mitigation strategies and provided data to support related mitigation efforts by other agencies or groups.

In 2006 the Service's Pacific Islands Fisheries Science Center again deployed research

teams to all major breeding colonies in the NWHI. It also implemented improvements to a new system for entering data directly into databases on each colony while in the field. The Center also hired a full-time researcher to work on monk seals in the main Hawaiian Islands. This new position enabled substantial progress to be made in developing a new main Hawaiian Islands monk seal database comparable to those for breeding colonies in the NWHI.

Entanglement and Debris Clean-up: Hawaiian monk seals, particular juveniles, can be killed or seriously injured by becoming entangled in marine debris. Since the early 1980s monk seal field crews have documented more than 300 entangled seals, caught principally in pieces of trawl netting and line that drift into the Hawaiian archipelago from commercial fisheries scattered throughout the North Pacific Ocean. Research teams have disentangled more than 200 of the animals judged unlikely to be able to free themselves. They also routinely clear beaches of hazardous debris. Such debris poses hazards not only to monk seals but also to other marine life, including hard corals. The efforts by monk seal researchers to document entanglements and marine debris led to an intensive multiagency program to remove hazardous netting caught on coral outcrops throughout the NWHI. Begun in 1998 and coordinated by the National Oceanic and Atmospheric Administration, annual cleanup efforts by divers have removed more than 400,000 pounds of derelict net from lagoon reefs, particularly those near monk seal pupping beaches. Although new debris continually washes into the NWHI, and seal entanglements have continued to occur at seemingly undiminished rates, disentanglement and cleanup efforts undoubtedly have prevented many monk seal deaths. In 2006 monk seal field teams documented six entangled seals in the NWHI. Entangling material was removed from three of those seals, and the other three were able to free themselves.

Captive Care Programs: In 1981 the Service began a "headstart" program at Kure Atoll.



Figure 12. The Hawaiian monk seal. Photograph courtesy of NOAA Photo Library; photograph by Dr. Dwayne Meadows, National Marine Fisheries Service.

Under that program, newly weaned female pups were captured and held for a few months in pens at Kure in an attempt to reduce high rates of mortality during the first few months after weaning. In 1984 that effort was augmented by a rehabilitation and release program designed to rescue underweight female pups at French Frigate Shoals that were judged to have a low chance of survival. Those seals were captured, transported to a rehabilitation facility in the main Hawaiian Islands for fattening, and then released at Kure, where food supplies appeared to be more readily available than at French Frigate Shoals. The headstart program ended in 1991, and in 1995 all captive care efforts were suspended when 10 of 12 seals captured that year for rehabilitation developed eye problems of undetermined origin that left them blind and unreleasable.

Before ending, however, those programs had protected and released 33 seals at Kure

through the headstart program and 69 through the rehabilitation program. In combination with steps to reduce disturbance of seals by Coast Guard personnel, those efforts improved juvenile survival rates and reversed a steady decline in abundance at Kure. In the past few years, after a thorough assessment of captive maintenance procedures, tentative steps have been taken to resume captive care efforts to improve juvenile survival rates. In October 2006 a pilot program was begun at Midway Atoll. This cooperative effort, conducted by the National Marine Fisheries Service with support from the Fish and Wildlife Service, the Coast Guard, the National Weather Service, the Marine Mammal Center, Hubbs SeaWorld, and SeaWorld of San Antonio, involved capturing female pups and juveniles and maintaining them in a pen at Midway to enhance their likelihood of survival. The seals were still in captivity at the end of 2006, with release anticipated for the spring

of 2007. They will be monitored after release to determine survival rates.

Attacks by Aggressive Males: Male Hawaiian monk seals have exhibited aggressive mating behavior that has been a source of injury and mortality for female adults, subadults, juveniles, and even pups. One or more males attempting to mount other animals repeatedly bite the backs of their victims, leaving open wounds that can attract sharks or cause death by infection or fluid loss. The behavior was first observed at Laysan and Lisianski Islands, where, for an unknown reason, sex ratios had become strongly biased toward males. In 1984, 10 males at Laysan Island exhibiting aggressive behavior were captured and moved to Johnston Atoll, about 600 nmi south of the Hawaiian Islands. Five more males exhibiting such behavior were captured in 1987 and held in captivity, and 22 males were captured in 1994 and moved to the main Hawaiian Islands. None of the relocated animals was resighted at Laysan, and occurrence of such injuries declined notably after 1994. The removals also helped bring the atoll's male-biased sex ratio, which may have contributed to the problem, closer to parity. The most recent effort to remove aggressive males involved two adult males known to have killed pups at French Frigate Shoals. Those animals were captured and moved to Johnston Atoll in 1998.

During 2006 a low number of male aggression incidents and injuries was observed, and no male seals were removed. At Laysan Island, an adult and a subadult female were observed with relatively minor injuries. At French Frigate Shoals, two pups with severe injuries from shark attacks also showed evidence of injuries from male aggression, and both died of the injuries. At Kure, a weaned pup was observed being held underwater by an adult male but escaped with only minor injuries after researchers intervened.

Shark Predation: In the late 1990s researchers observed an alarming increase in shark predation at French Frigate Shoals. Be-

tween 1997 and 1999, 50 percent of all pups born at the atoll either were observed under attack by Galapagos sharks patrolling a few feet off pupping beaches or disappeared abruptly, suggesting that they had been eaten by sharks. Believing that the patrolling of pupping beaches was a learned behavior limited to a few individual sharks, researchers began tagging and removing sharks found swimming along pupping beaches and attacking seals. In addition, researchers moved some newly weaned pups to other islets at the atoll where shark predation had not been observed. Between 2002 and 2005, 12 sharks were killed. Although the number of monk seal pups lost to sharks declined after those efforts began, it remains higher than at other atolls, and the problem appears to have spread to other French Frigate Shoals islets. The sharks also have become more wary of researchers, making it more difficult to remove those identified as preying on pups.

During 2006 shark predation continued to be a problem at French Frigate Shoals. Although several attempts were made to remove identified individuals, no additional sharks were killed. Only 39 pups were observed during the 2006 field season, the lowest number of births on record. Of those, 16 pups died or disappeared before the end of the field season, including two deaths confirmed to have been shark-related and five others where shark predation was strongly suspected.

Management in the Main Hawaiian Islands: One of the most encouraging prospects for Hawaiian monk seal recovery is the reappearance of seals in the main Hawaiian Islands. An analysis of photographs of seals collected through 2006 revealed that at least 77 seals now inhabit the main Hawaiian Islands. A record high of 12 births was documented in 2006.

Monk seal reoccupation of the main Hawaiian Islands brings with it many new management challenges. Not the least of these are minimizing interactions between seals and beach-goers and fishermen, and the risk of disease transmission from domestic animals and

livestock. To address these challenges, the Service, as well as state and local agencies, other federal agencies (including the Marine Mammal Commission), native Hawaiian and environmental groups and local citizens have begun working cooperatively to protect seals that haul out on recreational beaches and to respond to seals found entangled or hooked by fishing gear. The Hawaii Division of Aquatic Resources has hired a monk seal response coordinator for the island of Kauai to work with local volunteers whose tasks include posting temporary protection zones around seals on busy recreational beaches and monitoring haul-out sites. The Service also has hired staff to serve a similar role on Oahu. The Service and cooperating scientists also have initiated efforts to monitor seals for diseases, minimize their exposure to disease, and investigate the development of vaccines for certain diseases.

During 2006 there were seven confirmed monk seal deaths in the main Hawaiian Islands, including a subadult male whose death was linked to disease and a pup drowned in a gillnet off Oahu. Five other seals were found with fish hooks embedded in their skin. Three of those were caught and had the hooks removed, one was able to shed the hook by itself, and one was not resighted.

Updating the Hawaiian Monk Seal Recovery Plan

The Endangered Species Act requires that recovery plans be prepared for any listed species likely to benefit from such a plan. Recovery plans are intended to identify and guide research and management activities necessary to bring about the species' recovery. The first and, to date, only recovery plan developed for Hawaiian monk seals was completed by the Service in 1983. Recognizing that the plan was badly outdated and that better guidance was needed to address current recovery issues, the National Marine Fisheries Service reconstituted the Hawaiian Monk Seal Recovery Team in 2001 to help draft a new recovery plan. The

team completed a draft revision late in 2005, and on 26 November 2006 the Service circulated a modified draft for public review and comment. The circulated draft reorganized and revised some sections prepared by the team and added an implementation schedule with cost estimates for identified tasks.

The draft plan circulated by the Service noted that, notwithstanding many significant past efforts, overall monk seal abundance continues to decline and an aggressive expansion of recovery work is urgently needed. It emphasized the importance of actions to (1) improve the survivorship of females, particularly juveniles, in the NWHI through additional work to study factors causing poor juvenile survival, intervening where appropriate to enhance juvenile and adult female survival, preventing shark predation and the occurrence of aggressive behavior by adult male seals, and continuing to remove marine debris; (2) maintain an extensive field presence in the NWHI to carry out research and management activities; (3) ensure growth of the monk seal population in the main Hawaiian Islands through improved coordination among parties participating in recovery work; and (4) reduce the chances of inadvertent introduction of infectious diseases into the monk seal population.

The stated goal of the draft plan is "... to assure the long-term viability of the Hawaiian monk seals in the wild, allowing initially for reclassification to threatened status and, ultimately, removal from the List of Endangered and Threatened Wildlife." To downlist the species to threatened status, the following criteria were proposed: (1) a total abundance level of 2,900 seals in the NWHI; (2) at least 100 seals in five of the six major NWHI subpopulations and 500 seals in the main Hawaiian Islands; and (3) female survival rates that are high enough to assure that calculated growth rates of all populations are not negative.

To accomplish this goal, the draft plan listed and ranked more than 100 tasks under 14 categories of activities (Table 8). The plan also projected funding needs for most identified

tasks over a five-year period. Although projected funding needs for the first year of work exceeded \$20 million and ranged from \$7.2 to \$8.3 million in subsequent years, most identified funding needs appeared to involve costs for related research and management activities by other agencies. Although benefiting Hawaiian monk seals, those identified funding needs addressed issues broader than monk seal recovery alone (e.g., preventing vessel groundings in the NWHI, completing repairs for a seawall on Tern Island at French Frigate Shoals, and assessing the status of lobster stocks in the NWHI). In many cases, identified tasks were listed only by a title, and it was unclear precisely what work would be required and whether projected cost estimates were appropriate.

At the end of 2006 the Marine Mammal Commission was reviewing the draft plan and expected to provide comments to the Service early in 2007. Based on preliminary results of its review, the Commission expected to recommend that the Service place highest priority on funding activities likely to contribute directly to the species' recovery by increasing survival rates of adult and juvenile females and promoting an increase in the number of monk seals in the main Hawaiian Islands. It also expected to recommend that the Service:

- adopt the proposed biological criteria for downlisting species;
- provide brief descriptions of work required to carry out each listed task;
- expand the list of recovery tasks to include

Table 8. Short-term and long-term actions and projected cost estimates (in \$ thousands) identified in the draft recovery plan for Hawaiian monk seals prepared by the National Marine Fisheries Service (* = costs included under category 12)

Recovery Action Category	FY-1	FY-2	FY-3	FY-4	FY-5
1. Investigate and mitigate factors affecting food limitation	940	970	1,020	970	870
2. Prevent entanglements	1,335	1,325	1,310	1,285	1,270
3. Reduce shark predation	350	250	250	250	250
4. Prevent spread of infectious diseases	630	567	567	567	567
5. Conserve monk seal habitat	11,362	312	312	112	112
6. Reduce interactions with fisheries	1,625	1,625	1,625	1,625	1,625
7. Reduce male aggression	*	*	*	*	*
8. Minimize sources of human disturbance	1,249	1,249	1,249	1,249	1,249
9. Investigate and respond to biotoxin impacts	425	200	125	75	75
10. Reduce impacts from vessel groundings	487	75	62	62	132
11. Reduce impacts of contaminants	65	0	0	0	0
12. Continue population monitoring	1,550	1,500	1,450	1,450	1,450
13. Create a main Hawaiian Islands monk seal management plan	40	10	-	-	-
14. Implement education and outreach programs	310	150	150	150	150
Total	20,368	8,233	8,120	7,795	7,270

- (1) studies of monk seal foraging patterns in the main Hawaiian Islands,
 - (2) the preparation of a report analyzing past efforts to mitigate shark predation,
 - (3) the removal of sharks known to be preying on monk seals,
 - (4) the development of a plan for guiding decisions on when and where to move seals at risk of human interactions in the main Hawaiian Islands, and
 - (5) an assessment of procedures to protect seals that haul out on recreational beaches in the main Hawaiian Islands;
- consult with the Hawaiian Monk Seal Recovery Team to reassess priorities and projected costs assigned to identified tasks; and
 - distinguish in the implementation schedule between costs that should be part of the core monk seal recovery program (i.e., funded by appropriations under the Endangered Species Act and Marine Mammal Protection Act) and those more appropriately authorized under other statutes or by other sources.

Establishment of the Northwestern Hawaiian Islands Marine National Monument

Over the past 10 years the exceptional abundance and diversity of wildlife in the NWHI have sparked a series of significant steps to strengthen protection of the region's natural habitats. As discussed in previous annual reports, recent efforts have focused on developing management measures to convert the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve, designated by President Bill Clinton in 2000, into a national marine sanctuary. However, on 15 June 2006, in a sweeping and unexpected move to further consolidate and strengthen wildlife protection in the NWHI, President George W. Bush bypassed the sanctuary designation process by signing Proclamation 8031 and setting aside approximately 139,793 square miles of federally owned land and water areas as the Northwest-

ern Hawaiian Islands Marine National Monument. The purpose of the new monument is to protect the NWHI coral reef ecosystem and associated wildlife, as well as the region's historical, cultural, and scientific resources. In doing so, President Bush established the nation's first "marine" national monument and the world's largest marine protected area.

Management authority for the new monument is split between the Department of the Interior and the Department of Commerce. Primary management authority for all marine areas is vested in the Secretary of Commerce, through the National Oceanic and Atmospheric Administration and in consultation with the Secretary of the Interior. Sole responsibility for managing all areas overlaying the Midway Atoll and Hawaiian Islands National Wildlife Refuges and the Battle of Midway National Memorial is given to the Secretary of the Interior, through the Fish and Wildlife Service and in consultation with the Secretary of Commerce. Earlier in 2006 the National Oceanic and Atmospheric Administration, the Fish and Wildlife Service, and the Hawaii Department of Land and Natural Resources had signed an interagency agreement on managing resources in the NWHI. Proclamation 8031 directed that the Secretaries review its provisions and make any changes that might be needed in light of requirements in the proclamation.

To meet the purposes of the monument, the proclamation directed that the Fish and Wildlife Service and the National Oceanic and Atmospheric Administration institute a permit system to authorize activities that could be conducted with adequate safeguards for the resources and ecological integrity of the monument. It also directed that they issue any additional regulations as might be needed to properly care for and manage monument resources. The Secretary of Commerce, in consultation with the Secretary of the Interior and the state of Hawaii, also was directed to prepare and circulate for public review a management plan for the monument based on the plan developed by the National Marine Sanc-

tuary Program for the sanctuary designation process. As additional management guidance, the proclamation specified various measures to prohibit, regulate, permit, or otherwise restrict activities within the monument. Some of those measures are summarized in Table 9. At the end of 2006 information on whether or what further regulations might be needed and a schedule for preparing the monument management plan was expected to be forthcoming in 2007.

Development of an Interim Visitor Services Plan for Midway Atoll

On 26 December 2006 the Fish and Wildlife Service requested comments on a draft interim plan for allowing and managing public visitors to Midway Atoll. Midway Atoll is managed under several authorities as the Midway Atoll National Wildlife Refuge, the Battle of Midway National Memorial, and, most recently,

Table 9. Selected provisions in Proclamation 8031 establishing the Northwestern Hawaiian Islands Marine National Monument

<ul style="list-style-type: none"> • Entry to the monument is prohibited unless authorized by the managing agencies. • At least 72 hours advance notice is required for entry. • All vessels entering the monument must have an approved vessel monitoring system. • Exploring for or extracting oil, gas, or mineral resources is prohibited. • Anchoring on living or dead coral is prohibited. • Unless otherwise permitted in the proclamation, it is prohibited to do the following: remove, harvest, damage, or possess any living or non-living monument resource; discharge or deposit any material, except fish parts during authorized fishing or discharge incidental to vessel use; desert any vessel aground, at anchor, or adrift; touch any living or dead coral; possess fishing gear except when stowed or not available for immediate use; swim, dive, or snorkel in any Special Preservation Area or the Midway Atoll Special Management Area; and attract any living resources in the monument. • All commercial fishing will be subject to the following restrictions: <ol style="list-style-type: none"> 1 vessels must carry a valid permit; 2 vessels must carry an observer when requested; 3 any lobster fishing permit shall be subject to a zero annual harvest limit; 4 annual landings of bottomfish and pelagic species may not exceed 350,000 pounds and 180,00 pounds, respectively; and 5 commercial fishing for bottomfish and pelagic species will be prohibited after five years from the date of the proclamation. • Regulated activities that may be authorized by permit include the following: <ol style="list-style-type: none"> 1 research to further understanding of the monument; 2 educational activities related to monument resources; 3 conservation and management of monument resources; 4 Native Hawaiian practices; 5 special ocean use; and 6 recreational activities.
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the Midway Atoll Special Management Area in the new Northwestern Hawaiian Islands Marine National Monument. The draft management plan was initially developed to meet new requirements for managing national wildlife refuges and national memorials. In light of the atoll's new designation as part of the marine national monument, however, the draft plan was put forward as an interim measure pending development of the broader monument management plan.

An earlier public use plan developed for the Midway Atoll Refuge in 1996 established guidelines for managing up to 100 overnight visitors per day. That program was suspended in 2002 when the concessionaire managing visitor activities withdrew from its agreement with the Service. Since then, the Service has sought to reinstate a program that would meet dual objectives for both wildlife protection and for providing opportunities for public enjoyment under the atoll's status as a national wildlife refuge, a national memorial, and a national monument. The draft interim plan is intended to identify measures that will ensure that visitor activities are compatible with resource protection, and applies only to Midway Atoll. The visitor program proposed in the draft plan calls for a level of visitation that is more modest than that under the previous program. It would allow up to 30 overnight visitors in 2007, up to 50 overnight visitors in subsequent years as long as the plan remained in effect, up to three cruise ship visits per year, and a six-month visitation period each year. Among the activities allowed in the plan are viewing wildlife and historical artifacts, swimming, diving, kayaking, boating, and participating in various supervised management activities, such as cleaning marine debris from beaches and maintenance of historical artifacts.

The plan also proposes restrictions on those activities to protect wildlife and historical resources. Among other things, it proposes a prohibition on unguided access to one of the two major islands at the atoll, closure of

most beaches to public access, requirements that visitors use certain trails and roads when moving about the island, a prohibition on approaching island shorelines closer than certain distances by boats and kayaks, a prohibition on approaching Hawaiian monk seals and certain other sensitive wildlife closer than 150 feet, requirements that all visitors undergo an orientation program, and requirements that cruise ship visitors remain on board their vessels overnight and be part of guided tours when they come ashore.

At the end of 2006 the Commission expected to provide comments to the Service on its draft plan early in 2007.

Caribbean Monk Seal *(Monachus tropicalis)*

The Caribbean monk seal is one of three tropical species of monk seals that make up the world's most primitive and most endangered genus of pinnipeds. The other two are the Hawaiian monk seal (*M. schauinslandi*) and the Mediterranean monk seal (*M. monachus*). Based on recovered fossils, archaeological records, and historical accounts dating from the voyages of Columbus, Caribbean monk seals occurred principally in coastal waters along the east coast of Florida and the Bahamas, the Gulf of Mexico from Florida to the Yucatan Peninsula, the Central and South American coasts of the Caribbean Sea, and the Greater Antilles and northern Lesser Antilles. The northernmost record is from fossil remains found near Charleston, South Carolina. The last reliable sighting of the species was of a small group of animals reported on Serranilla Bank between Jamaica and the Yucatan Peninsula in 1952.

Like many other seals, Caribbean monk seals required beaches on which to pup, rest, and molt. Aboriginal human populations living along the coasts of North and Central America and some of the larger islands in the Bahamas and Caribbean apparently exploited monk seals. By the time Columbus reached the New

World, their distribution was limited to remote, uninhabited islands and banks. With the arrival of Europeans, hunting pressure intensified and spread throughout the more remote islands. By the late 1800s the species was very close to extinction. Nevertheless, reliable records of a few individuals persisted through the early 1900s in the Florida Keys, at islands off the northern Yucatan Peninsula, and at Serranilla Bank. In 1967 Caribbean monk seals were listed as endangered under the Endangered Species Preservation Act, a precursor to the current Endangered Species Act. When the latter act was passed in 1973, Caribbean monk seals were omitted from the list of endangered species for unknown reasons. Although possibly already extinct by that time, the species was relisted in 1977 at the recommendation of the Marine Mammal Commission to facilitate protection in the event that a surviving colony was rediscovered.

Since the early 1950s scientists have mounted several searches for surviving animals. These included aerial surveys of remote islands off the Yucatan Peninsula in 1969 and 1973 and vessel surveys to several of those islands in 1980 and to islands in the southeastern Bahamas in 1984. Although no evidence of seals was found on any of those expeditions, there were abundant signs that their last known habitats had been visited regularly by fishermen. Among other things, investigators found signs of temporary fishing camps, remains of slaughtered sea turtles, excavated turtle nests, and other indications of frequent marine resource exploitation. Despite the failure to locate monk seals, unconfirmed reports of seal sightings persisted in some areas, such as the north coast of Haiti. In 1982 the Commission funded a survey of fishermen and coastal residents in Haiti to attempt to assess the veracity of those reports. Although 2 of the 77 people interviewed reported recent seal sightings, the sightings could not be confirmed as monk seals. All seal sightings in the Caribbean since the early 1950s that could be confirmed as to species have been species other

than Caribbean monk seals (that is, California sea lions that had escaped from captivity or cold-water wanderers, such as hooded seals). Thus, the animals sighted since the 1950s could not be confirmed as surviving monk seals.

On 29 November 2006 the National Marine Fisheries Service announced plans to conduct a five-year status review of Caribbean monk seals pursuant to provisions of the Endangered Species Act. The Service requested any information on the species that had become available since the last such review was conducted in 1984. As of the end of 2006 the Commission planned to respond to the request by regretfully suggesting that the Service consider the species to be extinct.

Florida Manatee

(Trichechus manatus latirostris)

The Florida manatee is a subspecies of the West Indian manatee found only in the southeastern United States. It lives principally in rivers and coastal waters of Florida, but in spring and summer when water temperatures are warm, some manatees migrate north to Georgia and South Carolina and west to Louisiana and Texas in search of sea grasses, their preferred food. In winter, manatees are restricted to central and southern Florida near localized pockets of warm water where temperatures generally remain above 22°C (72°F). Those sites include warm-water springs, power-plant outfalls, and, in southernmost Florida, passive thermal basins formed by natural or dredged depressions that cool slowly during severe or prolonged cold spells. Although some manatees can tolerate temperatures as cold as 15°C (60°F) for short periods, and manatees routinely leave warm-water refuges for brief feeding excursions into waters 18–19°C (65–68°F), extended exposure to such temperatures can be lethal, especially for calves, which lose heat more rapidly than adults because of their small size.

The best estimate of Florida manatee abundance is a maximum count of about 3,300

animals made during a statewide survey at and near known warm-water refuges on 5–6 January 2001. The survey revealed that about two-thirds of the animals counted were at power-plant outfalls, 15 percent were at warm-water springs, and most of the rest were at passive thermal basins in southern Florida. Statewide counts have been made on the coldest days of the year since 1991 because animals are most likely to be aggregated at warm-water sites. The counts do not provide reliable estimates of abundance because the number of manatees away from refuges during the counts is uncertain, and the number at warm-water sites may be difficult to determine because visibility there is often limited. In 2006 the maximum winter count was 3,113 manatees recorded on 13–17 February. The count included 1,639 animals on Florida's east coast and 1,474 on the west coast.

Florida manatees occur in four relatively discrete subpopulations, two on each coast. Although animal movements from the subpopulations on each coast may overlap, the animals rarely move between coasts (Figure 13). Two of the four subpopulations rely almost exclusively on warm-water springs to survive winter. On the east coast, the upper St. Johns River subpopulation depends primarily on Blue Spring. The northwest Florida subpopulation relies principally on a spring complex at the head of the Crystal River in Kings Bay and Homosassa Springs, a few miles to the south. The size of both of those subpopulations has been increasing steadily for several decades and in recent years they have begun to make increasing use of other warm-water springs in their respective regions.

In contrast to those two groups, the two largest subpopulations—the Atlantic coast and southwest Florida subpopulations—rely sub-

stantially on power-plant outfalls. Together, the two populations make up about 85 percent of all Florida manatees. In recent years the Atlantic coast subpopulation has been relatively stable or increasing slowly while the southwest population is thought to have been decreasing. The vast majority of the Atlantic coast subpopulation relies largely on five power-plant outfalls while the southwest subpopulation relies on a combination of power-plant outfalls and thermal basins.

In 2006 a record high 420 manatee carcasses were documented in the southeastern United States (Table 10). The deaths were due primarily to collisions with watercraft and exposure to red tide toxins. As noted in past annual reports, watercraft-related deaths pose the most immediate threat. Based on the manatee carcasses found, approximately one-quarter to one-third of all manatee deaths recorded annually can be attributed to watercraft, and most manatees in Florida have propeller scars from non-lethal collisions. The 2006 total for watercraft-related deaths—87 animals—was the second highest on record, exceeded only by the 98 deaths re-

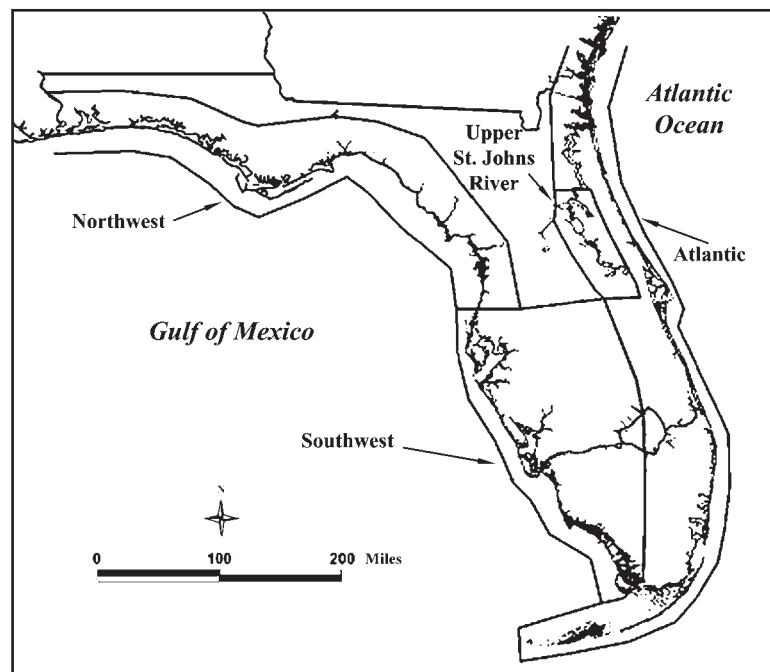


Figure 13. Ranges of the regional subpopulations of Florida manatees.

Table 10. Known manatee mortality in the southeastern United States (excluding Puerto Rico) reported through the manatee salvage and necropsy program, 1978–2006

Year	Watercraft No. (%)	Floodgate And Locks No. (%)	Other Human- Related No. (%)	Perinatal No. (%)	Cold Stress No. (%)	Other ² No. (%)	Total
1978	21 (25)	9 (11)	1 (2)	10 (12)	--	43 (51)	84
1979	24 (31)	8 (10)	9 (12)	9 (12)	--	28 (36)	78
1980	16 (24)	8 (12)	2 (3)	13 (19)	--	28 (42)	67
1981	25 (21)	2 (2)	4 (3)	13 (11)	--	75 (63)	119
1982	20 (17)	3 (3)	2 (2)	14 (12)	--	81 (67) ³	121
1983	15 (19)	7 (9)	5 (6)	18 (22)	--	36 (44)	81
1984	34 (26)	3 (2)	1 (1)	26 (20)	--	67(51)	131
1985	35 (27)	3 (2)	5 (4)	25 (20)	--	60 (47)	128
1986	33 (26)	3 (2)	1 (1)	27 (22)	12 (10)	49 (39)	125
1987	39 (33)	5 (4)	4 (3)	30 (25)	6 (5)	34(29)	118
1988	43 (32)	7 (5)	4 (3)	30 (22)	9 (7)	41 (31)	134
1989	51 (29)	3 (2)	5 (3)	39 (22)	15 (8)	63 (36)	176
1990	51 (23)	3 (1)	5 (2)	45 (21)	50 (23)	64 (29)	218
1991	56 (31)	9 (5)	7 (4)	53 (29)	2 (1)	54 (30)	181
1992	38 (23)	5 (3)	7 (4)	48 (29)	1 (1)	69 (41)	168
1993	35 (24)	7 (5)	7 (5)	39 (26)	2 (1)	58 (39)	148
1994	51 (26)	16 (8)	5 (3)	46 (24)	4 (2)	72 (37)	194
1995	43 (21)	8 (4)	5 (2)	56 (28)	0 (0)	91 (45)	203
1996	60 (14)	10 (2)	1 (0)	61 (15)	17 (4)	267 (64) ³	416
1997	55 (22)	8 (3)	9 (4)	61 (25)	4 (2)	109 (44)	246
1998	67 (27)	9 (4)	6 (2)	53 (22)	12 (5)	97 (40)	244
1999	83 (30)	15 (5)	8 (3)	54 (20)	6 (2)	107 (39)	275
2000	79 (28)	7 (3)	9 (3)	58 (21)	14 (5)	112 (45)	279
2001	82 (24)	1 (0)	7 (2)	63 (19)	32 (10)	151 (45)	336
2002	98 (31)	5 (2)	9 (3)	53 (17)	18 (6)	132 (42) ³	315
2003	75 (20)	3 (1)	7 (2)	72 (19)	48 (13)	178 (46) ³	383
2004	69 (24)	3 (1)	4 (1)	72 (26)	52 (18)	82 (29)	282
2005	80 (20)	5 (1)	9 (2)	89 (22)	29 (7)	186 (47) ³	398
2006	87 (21)	5 (1)	4 (1)	70 (17)	21 (5)	233 (55) ³	420

Data provided by the Florida Fish and Wildlife Research Institute, Florida Fish and Wildlife Conservation Commission; data for 2006 are preliminary.

¹ Includes deaths from entanglement or ingestion of marine debris, drowning in shrimp nets, poaching, vandalism, etc.

² Includes deaths due to other natural and undetermined causes.

³ Includes a large number of known or suspected red tide related deaths in southwestern Florida: 39 in 1982, 151 in 1996, 37 in 2002, 96 in 2003, 92 in 2005, and 62 in 2006.

corded in 2001. The principal management approach for preventing watercraft-related mortality has been the development of an extensive network of boat speed zones by the Florida Fish and Wildlife Conservation Commission and the Fish and Wildlife Service. This network was initiated in 1989 after the governor of Florida directed that speed zones be developed to protect manatees in 13 key counties. The state now has established countywide zones in all 13 key counties, with additional zones in parts of 14 other counties. Of the 1.55 million acres of in-shore rivers and bays in those 27 counties, state manatee protection zones now cover 46 percent of the total water area, with 15 percent of the area limited to idle or slow speeds. The Fish and Wildlife Service regulates an additional 14,000 acres largely in national wildlife refuges.

The second leading cause of direct human-related manatee deaths is crushing or entrapment in closing doors of floodgates and navigation locks. The number of these deaths increased in the 1990s to a record high of 16 in 1994. In response, the South Florida Water Management District and the U.S. Army Corps of Engineers led an effort to design reversing mechanisms that operate like elevator doors to prevent manatee entrapment. Since 1998 the agencies have installed gate-reversing systems at 26 structures, including most of those implicated in past manatee deaths. As a result, the number of deaths at water-control structures has decreased markedly. Almost all such deaths since 2001

have been at gates or locks either not yet fitted with the new devices or where reversing mechanisms were not operating properly. In 2006 five manatees were killed in floodgates and navigation locks. Four floodgates and four navigation locks remain to be modified, and work on them is scheduled to be completed by 2010.

Red tides contributed to the mortality of manatees in 2006. Over the past decade, exposure to brevetoxins produced by red tides along Florida's west coast has become an increasingly frequent and troubling threat to manatees. Red tides are caused by an excess of *Karenia brevis*, a planktonic dinoflagellate that produces brevetoxin. Red tides were first implicated as a cause of manatee deaths in 1982, when at least 39 manatees died in southwestern Florida. A similar but more severe red tide occurred in southwestern Florida in the spring of 1996 when at least 151 manatees died of confirmed or suspected red-tide poisoning. In four of the

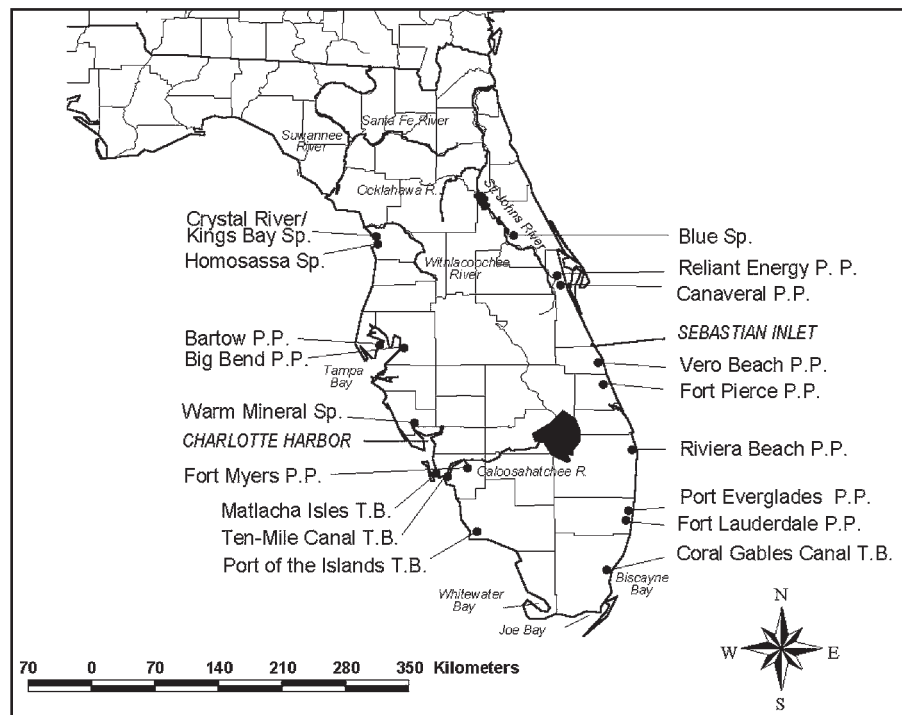


Figure 14. Natural and artificial warm-water refuges (P.P., power plant; Sp., spring; T.B., thermal basin) with at least one winter count of 50 or more manatees. Figure courtesy of Leslie Ward, Florida Fish and Wildlife Institute.

past five years (2002, 2003, 2005 and 2006), red tides killed, or were suspected to have caused the deaths of, between 31 and 96 manatees a year, including 62 deaths in 2006. In all other years since 1996, deaths attributed to this cause have ranged from 0 to 17 per year with an average of about 11 deaths per year. The reason for the recent increase in intense red-tide events along Florida's west coast is unknown. Possible factors include pollution, perhaps associated with nutrients in runoff discharged from rivers and groundwater, or large-scale changes in the regional marine ecosystem brought about by shifting climate patterns, the increasing frequency of hurricanes, or other factors.

In the long term, the greatest threat to Florida manatees may be the potential loss of localized warm-water habitats essential for winter survival (Figure 14). As noted earlier, perhaps two-thirds of all Florida manatees now use thermal effluents from power plants to survive the coldest winter periods. The two largest subpopulations of Florida manatees—the Atlantic coast and southwest Florida subpopulations—exhibit high levels of dependence on those sites. During the record high count in January 2001, nearly 85 percent of all Atlantic coast manatees and more than 50 percent of all southwest Florida manatees were found at power-plant outfalls, all of which are created by plants more than 30 years old. Many of those plants are likely to be retired in the next 20 years, and some may be closed within the next 5 to 10 years. Because new plants are prohibited from discharging thermal effluents substantially greater than receiving waters, any eliminated power-plant outfalls now used by manatees will not be replaced by new facilities.

Ambient water temperatures even in southernmost Florida are too cold to support manatees in at least parts of some winters. Therefore, in the distant past, manatees likely relied on warm-water springs in central and northern Florida and passive thermal basins in southernmost Florida to survive winter. Although located in colder parts of the state, warm-water

springs may have provided the optimal winter habitat for Florida manatees. This is indicated in part by patterns of cold-related deaths. For example, counties with warm-water springs typically are among those with the lowest number of recorded cold-stress-related deaths, even lower than many counties in southernmost Florida. Also, as noted earlier, the two manatee subpopulations that rely on warm-water springs also are the ones that have shown the most consistent pattern of growth over the past several decades. Long-term survival of Florida manatees may therefore depend on a shift in winter distribution from power-plant outfalls to natural warm-water springs and, to a lesser extent, passive thermal basins in southernmost Florida. However, reoccupation of some warm-water springs is now restricted or blocked entirely by fences, silted-in spring runs, downstream dams or locks, and various human modifications of spring basins. Spring flows adequate to support manatees also are threatened by groundwater withdrawal for domestic and agricultural use.

Achieving such a shift poses a serious dilemma for managers. If power-plant outfalls are eliminated by plant closures, many manatees in the two largest subpopulations may not find natural warm-water springs located outside their familiar range. In view of the relatively low number of manatees that spend winters in the southernmost part of the state, compared to the large numbers found at power plants in the north, it may be that passive thermal basins in the south simply cannot support large concentrations of manatees. Thus, if power plants in northern Florida are eliminated, habitat in southern Florida may not be adequate to support the large number of animals that will be in need of warm-water refuges. To address this dilemma, the Fish and Wildlife Service convened a Warm-Water Task Force, composed of representatives of state and federal agencies (including the Marine Mammal Commission), Florida's electric utility industry, environmental groups, and the scientific community.

The task force is considering a long-term strategy that would maintain current abundance levels for an interim period (e.g., 20 to 25 years), pending steps to encourage growth of manatee subpopulations using natural warm-water springs and passive thermal basins. To do so, steps are needed to (1) identify and encourage the removal of obstructions restricting manatee access to key natural springs suitable for sustaining manatees in winter, (2) establish minimum spring flows adequate to support manatees at natural springs, and (3) assess the feasibility of constructing temporary solar-heated refuges that could be used to replace power-plant outfalls on an interim basis if plants close or begin operating intermittently.

Interim Replacements for Power-Plant Outfalls

The challenge in transitioning away from power-plant outfalls is to avoid a sudden large-scale decline in manatee abundance over the next 20 years. To help the task force address this challenge, the Marine Mammal Commission supported a review of information on the dependence of manatees on warm-water refuges and alternative management actions.

Building on work funded by the Florida Power & Light Company, the Commission also supported a feasibility study of a closed-circuit heating system in which water heated by solar panels is circulated through a network of pipes to provide an artificial warm-water refuge. The report concluded that existing solar heating technology and associated pumps could maintain water temperatures in enclosures at 22°C (72°F) at the northernmost power-plant outfall currently used by manatees along the Atlantic coast. The estimated cost of solar panels ranged from \$130,000 to \$760,000 depending on the size of the enclosure. The costs are substantially lower for heating enclosures farther south. The report did not attempt to estimate costs for building the enclosure, the heat exchanger, or the land and support structure for the solar array.

Based on the results of those studies, Reliant Energy, owner of the northernmost power plant used by manatees along the Atlantic coast, offered to consider building a solar-heated manatee refuge on its property. As a peak-power facility (i.e., a plant that operates only when power demands are greatest), this plant operates intermittently and on some winter days it runs just to ensure that water temperatures at its outfall are warm enough to support manatees. As a result, the presence of a solar-heated refuge could allow the plant to power down on some cold days, realizing a considerable savings in fuel costs. Therefore, in cooperation with the Warm-Water Task Force, Reliant Energy and the Marine Mammal Commission jointly supported a project to design and estimate the cost of constructing a test refuge at the Reliant Energy plant. The purposes of such a pilot facility would be to (1) determine if manatees would use a heated enclosure on cold winter days when the power plant was operating in a maintenance mode with minimal thermal discharge, and (2) demonstrate the feasibility of solar heating technology to maintain water temperatures suitable for manatees throughout the winter.

In 2005 the Florida Solar Energy Center calculated the heat requirements and number of solar panels that would be needed to maintain a 15 m² (50 ft²) enclosure near the plant's outfall at a constant temperature of 22°C (72°F) on the coldest days on record for that location. Based on that information, Reliant Energy contracted for conceptual drawings and detailed cost estimates to construct a refuge enclosure and associated solar water-heating system with a gas-fired backup heater to sustain manatees at the plant's location over a 20-year period. In early 2006 preliminary results of the project suggested that such a facility could cost in excess of \$4 million, with more than half of the total cost required for constructing a solar panel array able to withstand hurricane-force winds.

Given concerns about the high costs and uncertainty as to whether manatees would use the enclosure, representatives of the task force

met with the contractors in the spring of 2006 to review the preliminary plans and consider possible ways to reduce costs. It was agreed that the most economical way to test the feasibility of such a refuge would be a two-phase approach. The first phase would involve constructing an enclosure with a heat exchanger and a gas-fired boiler that could simulate a solar water-heating system. Such a facility would operate for about five years to determine the extent to which manatees use the enclosure. If manatees used the enclosure, a solar panel array to heat the refuge would be installed as a second phase. Given fuel costs for a gas-fired system over the long term, it was estimated a solar heating system would be far more economical.

At the end of 2006 preliminary results of the revised approach suggested that direct costs for constructing the enclosure with an associated gas-fired heating system would be approximately \$1.6 million. A final project report with preliminary facility drawings and cost estimates is expected to be available in 2007. The report will be provided to the Fish and Wildlife Service and the Florida Fish and Wildlife Conservation Commission to determine any further steps that should be taken to proceed with constructing a pilot refuge.

Status and Management of Florida Manatees under State Law

Florida manatees have been listed as endangered under state law since the 1960s. In 2005, however, the Florida Fish and Wildlife Conservation Commission adopted new criteria and procedures for listing species as endangered, threatened, and species of special concern. The new criteria matched those used by IUCN—The World Conservation Union to rank species as critically endangered, endangered, and vulnerable.

Upon adopting its new criteria and procedures, the Florida Commission directed its staff to convene a biological review panel and reassess the status of Florida manatees. In April 2006 the review panel completed its review and

concluded that Florida manatees did not qualify as endangered under the state system, but that they did meet 2 of the 12 criteria required for listing as threatened. The two criteria that were met were (1) a projected decline in population size that could exceed 50 percent within three generations (60 years) and (2) an abundance of fewer than 2,500 mature individuals combined with a projected population decline of more than 20 percent in two generations (40 years). In both cases, analyses relied on a population model that projected trends in abundance based on predictions that risks to manatees would increase in the future (e.g., increasing watercraft mortality due to increasing numbers of boats and increasing cold-stress mortality due to power-plant closures). The model predicted a 12 percent chance that the number of Florida manatees would decline by more than 50 percent within 60 years. The second criterion was met based on a population-forecasting model that suggested that 70 percent of all Florida manatees were reproductively mature. Applying that proportion to the maximum count of 3,300 manatees made in 2001, the panel suggested that the current number of mature animals is 2,310.

Based on the review panel's findings, staff of the Florida Commission recommended that Florida manatees be reclassified from endangered to threatened under state law. The Florida Commission concurred and at its meeting in June 2006 directed that steps be taken to do so. Under the state's new listing procedures, a management plan must first be adopted to identify and guide actions that would allow recovery of the population to a point where it could be removed from the state's list of imperiled species. Therefore, in November 2006 the Florida Commission circulated a draft state manatee management plan for public review and comment.

The stated goal of the draft plan was "to ensure a healthy, viable Florida manatee population with sustainable habitat throughout its range." The draft plan identified a series of management actions that the state would continue

to pursue over the next five years. Among those actions were (1) maintaining and, as necessary, expanding the network of boat speed zones to protect manatees; (2) coordinating manatee-related law enforcement efforts among federal and state agencies; (3) maintaining waterway signs marking regulatory zones; (4) continuing to review permit applications for development projects affecting manatee habitat; (5) reviewing county manatee protection plans; (6) protecting manatee habitat, particularly warm-water refuges; (7) continuing to produce public outreach and education materials; and (8) continuing to hold periodic stakeholder meetings convened jointly with the Fish and Wildlife Service.

To measure progress toward recovery, the draft plan also identified three measurable biological goals loosely based on the adopted state criteria, including—

- regional adult survival rates sufficient to avoid predicted declines greater than 30 percent over the next three manatee generations, given available warm-water resources;
- regional warm-water carrying capacity sufficient to avoid predicted declines greater than 30 percent over the next three manatee generations (60 years), given prevailing rates of adult survival; and
- a population size that exceeds 2,500 mature animals statewide.

With regard to the latter criterion, the draft plan stated that at least 2,181 mature individuals were currently estimated to be in the population.

At the end of 2006 the Marine Mammal Commission expected to return comments on the draft management plan to the Florida Commission early in 2007. Based on its preliminary review, the Commission concluded that the proposed management actions appeared appropriate but that the proposed recovery goals were confusing and inappropriate. Among other things, the plain meaning of the first two recovery goals suggested that the state could delist the species even if it declined 30 per-

cent in coming years. Moreover, the recovery goals appeared inconsistent with the adopted state listing criteria that call for listing species or populations as species of special concern if they have between 2,500 and 10,000 mature individuals with a projected 10 percent population decline within two generations.

Based on its preliminary review, the Commission expected to recommend that the Florida Commission (1) identify the source and confidence intervals for the estimate of 2,181 mature Florida manatees, (2) delete measurable biological goal number 1 or revise it to identify a specific adult survival rate that would be sufficient to ensure that the population increases toward its carrying capacity level, and (3) replace measurable biological goal number 2 with a new goal specifying a certain proportion of the overall population of Florida manatees using natural springs or passive thermal basins that would be sufficient to remove them from the state's list of imperiled species.

Species in Foreign and International Waters

The Marine Mammal Protection Act directs the Commission to “recommend to the Secretary of State appropriate policies regarding existing international arrangements for the protection and conservation of marine mammals, and suggest appropriate arrangements for the protection and conservation of marine mammals.” Many marine mammal species and populations elsewhere in the world face major conservation challenges. Some species are in danger of extinction in the immediate future, and others are being extirpated in parts of their range. This report highlights some of the non-U.S. species and populations at greatest risk and identifies issues that must be addressed to conserve them. No attempt has been made to treat the subject comprehensively. Thus, the species and populations described here are only those for which significant new information became available to the Commission during 2006.



Figure 15. A baiji undergoing a physical examination in Wuhan, China. Photograph courtesy of Wang Ding, Wuhan Institute of Hydrobiology.

Yangtze River Dolphin (Baiji)

The Yangtze River dolphin or baiji (*Lipotes vexillifer*) is the last representative of an entire family of mammals (Figure 15) and is nearly, if not completely, extinct. A comprehensive visual and acoustic survey was conducted between 6 November and 13 December 2006 throughout the known range of the baiji in the Yangtze River between Yichang and Shanghai. No baiji were sighted by observers or detected by acoustic recording devices deployed from the survey vessels. Less intensive annual surveys during 1997–1999 had resulted in counts of 4 to 17 animals. The lack of sightings during the 2006 survey could mean that the last few baiji have disappeared since 1999 and that the species is extinct. If any baiji remain, they are few in number and face a huge risk of extinction.

The factors leading to the baiji's decline are all human-related and probably include habitat degradation, fragmentation, and loss due

to waterway management (e.g., damming and diversion for agriculture, hydroelectric power generation, flood control, and other purposes); direct and indirect fisheries interactions (e.g., illegal electrical fishing, entanglement and hooking, competition for prey); vessel strikes; and contaminants. Limited efforts to maintain baiji in captivity have failed, and despite more than two decades of scientific discussions and expressions of concern, few conservation measures have been implemented.

Although it may be too late to save the baiji, conservation efforts are still needed to protect other large aquatic vertebrates in the Yangtze River that face the same or similar threats. These include the endangered Yangtze finless porpoise and the critically endangered Yangtze sturgeon and Chinese alligator. The baiji's extinction should raise awareness of other endangered species in China and around the world, but whether that awareness will lead to more

precautionary, effective conservation remains to be seen. The factors that drove the baiji toward extinction are typical of the threats facing aquatic and marine wildlife in many nations. The political, economic, and logistical challenges to effective conservation on the Yangtze River are also common to many countries and ecosystems.

Finless Porpoise

The finless porpoise (*Neophocaena phocaenoides*) has generally been recognized as a single species with three forms (subspecies) but may be two species, each with two or more subspecies. Finless porpoises occur in shallow coastal waters and estuaries from Japan to the Arabian Gulf and south to East Timor. One form, *Neophocaena p. asiaorientalis*, inhabits the Yangtze River and associated lakes. The number of finless porpoises is unknown, but evidence indicates that they have been severely depleted, and perhaps even extirpated, in parts of their range. The finless porpoise is listed by the IUCN–The World Conservation Union as data deficient, and the Yangtze River population is listed as endangered.

The primary threat to Yangtze River finless porpoises is incidental mortality in fisheries, particularly in gillnet fisheries. Other potential threats include mortality from electrical fishing and reductions in prey from overfishing, as well as habitat degradation, waterway management, and high levels of contaminants. The November–December 2006 Yangtze River survey noted earlier sighted finless porpoises and collected information on water quality and other habitat characteristics of the river. At the end of 2006 data from the survey were being analyzed to produce an estimate of the number of finless porpoises in the Yangtze River. The likely extinction of the baiji raises concerns about the health of the Yangtze River ecosystem and highlights the need for strong conservation efforts in the near future to prevent a similar fate for the river's finless porpoises.

Ganges and Indus River Dolphins

The taxonomic status of dolphins in the Ganges and Indus Rivers is not settled. Currently the two populations are classified as subspecies (*Platanista gangetica gangetica* and *P. g. minor*), but they also have been—and after further review may again be—considered separate species (*P. gangetica* and *P. minor*). They occur separately in the Ganges-Brahmaputra-Meghna and Karnaphuli-Sangu River systems (Ganges River dolphin) and the Indus River (Indus River dolphin). The IUCN considers both to be endangered. Preliminary data collected from a comprehensive survey in April 2006 suggest that the number of Indus River dolphins in one of the downstream segments (between the Guddu and Sukkur barrages) has increased considerably since 2001, when a rangewide survey indicated a total population of approximately 1,200 dolphins in the entire river system. Researchers speculate that numbers have been increasing slowly since Pakistan banned the hunting of these dolphins in the mid-1970s. Currently, one of the greatest threats to Indus River dolphins is the diversion of water into irrigation canals, which reduces the amount of dry-season habitat. No rangewide population estimate is available for the Ganges River dolphin, but surveys of portions of its range suggest that there are at least 1,200 to 1,800 animals.

The Indus River dolphin has been extirpated from about 80 percent of its historical range, and the Ganges River dolphin has been nearly extirpated in Nepal and probably also in some other badly degraded parts of its historical range (Figure 16). Threats to these species include fisheries interactions (e.g., entanglement in fishing gear, possibly competition for prey); habitat fragmentation, degradation, and loss caused by development; pollution (e.g., agricultural runoff, human sewage); and direct killing in a few areas for various purposes (e.g., to obtain bait for fisheries or oil for medicine

or liniment). Waterway management (barrages, damming, and diversion for agriculture and other purposes) is of particular concern because it fragments populations, degrades downstream habitat, and reduces flow in the natural channels of the rivers. During the 2006 Indus River survey, researchers found that the river was too shallow in most places to provide habitat for dolphins, which have never been recorded in areas less than two meters deep. Further analysis and a report of the 2006 Indus survey are expected in 2007.

Irrawaddy Dolphin

Irrawaddy dolphins (*Orcaella brevirostris*) are distributed sparsely in tropical and subtropical estuaries and the waterways of mangrove forests in the Indo-Pacific region. In addition, freshwater populations occur in the Mahakam, Ayeyarwady (formerly Irrawaddy), and Me-

kong River systems and Songkhla and Chilika Lakes. Irrawaddy dolphins were recently split into two species. The newly described snubfin dolphin (*O. heinsohni*) occurs in the coastal waters of northern Australia and southern Papua New Guinea. The IUCN considers five isolated subpopulations of Irrawaddy dolphins to be critically endangered. These subpopulations are located in the Ayeyarwady River of Myanmar (59 to 72 animals); Mahakam River of Indonesia (67 to 70 animals); Malampaya Sound of the Philippines (77 animals); Mekong River of Laos, Cambodia, and Vietnam (minimum of 127 animals); and Songkhla Lake of Thailand (no more than 10 to 30 animals). The population of Irrawaddy dolphins in Chilika Lake, India, has not yet been assessed by the IUCN but is estimated to consist of only about 85 individuals, with relatively high mortality from boat strikes and entanglement in gillnets.



Figure 16. Stranded Ganges River dolphin in the Sundarbans Delta of Bangladesh being released after a gillnet was disentangled from its beak. Photograph courtesy of Brian D. Smith.

Threats to Irrawaddy dolphins are similar to those facing Ganges and Indus River dolphins, including fisheries interactions; habitat fragmentation, degradation, and loss caused by development and waterway management; pollution; and direct killing for various purposes. The primary threat for Irrawaddy dolphins seems to be mortality caused by entanglement in fishing gear, particularly gillnets, although illegal electrical fishing is a concern in the Ayeyarwady River. In 2005 Myanmar prohibited the use of electricity to catch fish. Mercury contamination associated with gold mining also has been a concern in the Ayeyarwady River. In early 2005 the government of Myanmar banned gold mining in the Ayeyarwady River, but mining still may occur in the tributaries so mercury contamination from current or past mining still may be an issue for the dolphins. Between July 2005 and March 2006 18 dolphin carcasses were recovered in the Mekong River, including two adults, one juvenile, and 16 calves. Researchers are concerned that the large number of recent calf deaths may indicate a problem with environmental contaminants although analyses of mercury in dolphin tissues indicated that levels were not high.



Figure 17. Entanglement of vaquita in fishing nets is the primary threat to the species. Photograph by Christian Faesi, used with permission of Omar Vidal, World Wildlife Fund-Mexico.

Several local, national, and international conservation efforts are under way to provide some protection for Irrawaddy dolphins. A Workshop to Develop a Conservation Action Plan for Freshwater Populations of Irrawaddy Dolphins was held 21–26 March 2005, in Phnom Penh, Cambodia. At the end of 2006 the Conservation Action Plan and status reviews of several subpopulations of Irrawaddy dolphins were being developed for publication as a Wildlife Conservation Society working paper in 2007 (<http://www.wcs.org/wcspubs/science>). After the workshop, the Cambodian government approved the “Royal Decree on Determination of Protected Areas and Conservation of Dolphins,” which established nine core conservation zones in the Mekong River in which gillnetting and other activities that could potentially harm dolphins are prohibited. The Myanmar government declared a protected area for Irrawaddy dolphins that also is intended to protect a cast-net fishery in which humans and dolphins fish cooperatively along a 74-km (46-mi) segment of the Ayeyarwady River above the city of Mandalay. This fishery is unique and involves the fishermen summoning dolphins by acoustical means and the dolphins then herd-

ing fish schools toward the fishermen’s canoes. The dolphins benefit by preying on fish that are confused by the sinking cast-net or that are momentarily stuck in the muddy bottom after the net is pulled up.

As mentioned earlier, a final report on an investigation into the potential effects of declining freshwater flows on Ganges River dolphins and Irrawaddy dolphins in the Sundarbans Delta was submitted to the Commission in 2006. The report indicated that both species are dependent on

estuarine features associated with freshwater flow, making them especially vulnerable to habitat loss due to upstream damming or diversion of water.

Vaquita

The vaquita (*Phocoena sinus*) is the world's smallest porpoise and is found only in the northern reaches of the Gulf of California. The species is listed as critically endangered by the IUCN and as endangered under the Official Mexican Standards list of threatened and endangered species and the U.S. Endangered Species Act. Data collected in 1997 suggested a total population size of only about 500 to 600 vaquitas. The current number is unknown, but the International Committee for the Recovery of the Vaquita (Comité Internacional para la Recuperación de la Vaquita [CIRVA]) estimated that the population likely had declined to between 250 and 450 vaquitas by 2005. The primary threat facing vaquitas is bycatch, mostly in gillnet fisheries. Based on observer data and interviews with fishermen between January 1993 and April 1994, an estimated 39 vaquitas died during that period in gillnet fisheries (mainly for shrimp, charros, sharks, and sierras) near El Golfo de Santa Clara, one of the three main fishing villages in the northern Gulf.

Recovery efforts are led by scientists from the Mexican National Marine Mammal Program, National Institute of Ecology, in Ensenada, Mexico, working collaboratively with CIRVA. CIRVA was formed by the Mexican government in 1996 and met in 1997, 1999, and 2004. CIRVA focused initially on scientific research to assess abundance, distribution, and threats. Since 1999 CIRVA has recommended phasing out all gillnet and trawl fisheries in the upper Gulf of California and Colorado River Delta Biosphere Reserve and expanding the reserve to ensure that it encompasses all known vaquita habitat. In 2005, based on those recommendations, the Mexican Departments of Environment and Fisheries and the state governments of Sonora and Sinaloa banned gillnetting

and trawling within a portion of core vaquita habitat. The governments also agreed to compensate fishermen, a measure that was suggested by CIRVA to offset the socioeconomic costs of altering fishing practices.

Since 2001 the Marine Mammal Commission has provided support for research on the distribution and abundance of vaquitas, as well as for the third CIRVA meeting. In 2005 the Commission and others sponsored two meetings on the vaquita at the Society for Marine Mammalogy biennial conference in San Diego. At those meetings, Mexican authorities from the Departments of Environment and Fisheries met with international scientists to discuss threats facing vaquitas, the relative merits of various mitigation strategies proposed by CIRVA (including banning gillnets in the core habitat area), the potential for using acoustic techniques to monitor the population, results from recent acoustic surveys, and scientific research required to better understand the vaquita and assess its conservation status. Much of the recovery effort for the vaquita is focused on the development of socioeconomic measures to compensate for the loss of fishing opportunities as prohibitions are imposed on gillnet fishing in the northern Gulf of California.

Two major reviews were completed in 2006, both sponsored by the Marine Mammal Commission. The first was a historical review of vaquita conservation efforts, and a summary of the current status of those efforts was published in the journal *Mammal Review* in 2006. The second was an updated assessment of the vaquita for the IUCN Red List, which reaffirmed the species' status as critically endangered; that assessment will be publicly available when the Red List is updated in September 2007 (see www.redlist.org).

Hector's Dolphin

Hector's dolphins (*Cephalorhynchus hectori*) occur only in nearshore waters of New Zealand (Figure 18). Two subspecies are recognized based on genetics and morphology:



Figure 18. Hector's dolphin off Kaikoura, New Zealand. Photograph by Robin W. Baird.

Maui's dolphin (*C. h. maui*) on North Island's west coast and the South Island Hector's dolphin (*C. h. hectori*) around South Island. The South Island Hector's dolphin is the more abundant, numbering more than 7,000. The most recent estimate for Maui's dolphins, based on a 2004 survey, is only 111 animals, and the IUCN considers this subspecies to be critically endangered. The primary threat to both subspecies is bycatch in fisheries, particularly coastal set gillnet fisheries. The nearshore distribution of Hector's dolphins overlaps with both commercial and recreational coastal set net fisheries. In 2003 a protected area was created along the west coast of North Island to reduce incidental mortality by prohibiting coastal gillnetting out to 4 nmi; gillnetting is still permitted within harbors and trawling is permitted throughout the protected area. Hector's dolphins have been observed in several harbors within the North Island protected area, and they are taken incidentally in trawl fisheries off the South Island.

In addition to fisheries bycatch, potential

threats to Hector's dolphins include pollution, disease, aquaculture, coastal and offshore development, and marine tourism. A calculation of potential biological removal for Maui's dolphins (0.2) indicates that human-caused mortality must be reduced to near zero if the subspecies is to recover. New Zealand's Department of Conservation and Ministry of Fisheries are developing a threat management plan to address concerns regarding both subspecies of Hector's dolphins. The plan is scheduled for completion at the end of 2007.

Western Gray Whales off Sakhalin Island, Russia

The western North Pacific population of gray whales (*Eschrichtius robustus*) is listed as critically endangered by IUCN–The World Conservation Union. The population (excluding calves) currently numbers about 120 to 130 whales, of which 25 to 35 are reproductively mature females. Only four calves were documented in 2006 although survey efforts were

hampered by poor weather. The population is projected to be increasing at a few percentage per year. However, in 2005 three females (one mother and calf and one suspected yearling) died due to entrapment in fishing gear off the Pacific coast of Japan. No deaths were reported in 2006. The historical number of western gray whales is poorly known, but they were drastically reduced by commercial whaling and were thought to be extinct by the mid-1900s. A few whales were seen in the early 1970s, and observations increased in the 1980s off the northeastern coast of Sakhalin Island in the Sea of Okhotsk. The whales are now observed in these coastal waters each year from June to November. The nearshore conditions off northeastern Sakhalin Island appear to favor gray whale prey (e.g., amphipods, isopods), and the two main feeding areas for the whale population are located in that region.

The coastal waters around Sakhalin Island, particularly its northeastern coast, overlie large oil and gas reserves. The Russian Federation has divided the Sakhalin shelf into nine project areas for the purposes of controlling the commercial development of those reserves. Development is ongoing in three project areas and planned in several others. Sakhalin II is the most advanced project, having begun commercial production in 1999. Currently oil is produced only during the period when nearby waters are sufficiently ice free, from approximately June to November. Additional pipeline and associated development is under way at Sakhalin II to enable year-round production of both oil and gas. The facilities and activities of Sakhalin II are close to the foraging areas of the western gray whale population and pose a number of risks, including oil spills, ship strikes, and disturbance from noise associated with construction, shipping, and research activities. Additional risks come from the other oil and gas development projects in the Sakhalin region (the Sakhalin I and Sakhalin V projects are in early stages of development) and from a variety of activities elsewhere in the whales'

range and unrelated to oil and gas production, such as illegal directed killing, bycatch in fisheries, ship strikes, noise, and contaminants. The persistence and recovery of the western gray whale population will ultimately depend on whether it can withstand the cumulative effects of all the risk factors.

To address concerns about the Sakhalin II project, a panel of experts convened by the IUCN in 2004 conducted an independent review of the activities and plans of Sakhalin Energy Investment Company (SEIC). The panel's composition, terms of reference, and report (issued in February 2005) can be found on an IUCN Web site (<http://www.iucn.org/themes/business/isrp/index.htm>). The report focused on four main threats: construction and operational noise, oil spills, vessel/whale interactions and collisions, and degradation of the whales' feeding habitat. It included modeling results indicating that even relatively small changes in reproductive rates, and particularly survival rates, could have significant effects on recovery if those rates remain low over time. The report also emphasized that recovery of the western gray whale population is contingent on minimizing cumulative effects and concluded that a robust monitoring program was needed. Finally, the report called for the creation of a comprehensive, rangewide strategy for conservation of western gray whales.

The IUCN sponsored a follow-up workshop on 11–12 May 2005 to provide an opportunity for stakeholders to consider the review panel's report and SEIC's responses to it. The most important outcome of this workshop was an agreement that a long-term scientific advisory panel was needed to provide continued oversight and make recommendations that would help the company avoid unnecessary risks. Another meeting was held 17–19 September 2005 to further resolve some of the issues and, perhaps most important, develop terms of reference for the Western Gray Whale Advisory Panel, which would be sponsored by SEIC and convened by the IUCN.



Figure 19. Bowhead whales. Photograph courtesy of National Oceanic and Atmospheric Administration.

Because the panel could not be established in time to adequately review SEIC's plans for gray whale protection and monitoring during the 2006 construction season, the IUCN held a meeting of an interim group of independent scientists on 3–5 April 2006. At that meeting, participants discussed a variety of issues including annual population assessment, photographic and genetic identification of individual whales, biological sampling, satellite tagging, monitoring whale behavior and industrial noise, a carcass detection/salvage program, a marine mammal observer program, and additional environmental monitoring. The meeting also addressed oil spill issues and ship traffic rules. Participants developed a short-term work plan for the panel and concluded that it should function not as a reactive or review-only group, but as a proactive one. Deliberations and meetings were to be timed so that the panel could prescribe the types of monitoring and research needed as well as assess the findings or proposed

activities in documents produced by SEIC and other participating companies. The Western Gray Whale Advisory Panel was established by the IUCN on 2 October 2006 with the possibility of extension after an initial period of five years. The first meeting of the panel was held 9–11 November 2006, and its report is available at www.iucn.org/themes/marine/sakhalin/.

Bowhead Whale

All stocks of bowhead whales (*Balaena mysticetus*) were severely depleted by commercial whaling. Many tens of thousands have been killed by whalers since the early 1500s, and total removals easily exceed 100,000 animals. The Bering-Chukchi-Beaufort Seas stock currently numbers approximately 10,500 whales and is increasing. The Svalbard-Barents Sea (Spitzbergen) stock is classified as critically endangered by the IUCN. In April 2006, 17 to 20 bowheads were sighted during a survey of Fram Strait between Greenland and Svalbard—

an area where researchers had not expected to sight bowhead whales—and this could signify that this stock is larger than has been supposed. Bowhead whales in the eastern Canadian Arctic and West Greenland have been managed as two stocks, the Davis Strait–Baffin Bay stock and the Hudson Bay–Foxe Basin stock. Recent tagging work indicates, however, that the ranges of the two putative stocks overlap in both summer and winter, suggesting that there is a single eastern Canada–West Greenland stock. Recent genetic analyses also support the single-stock hypothesis. An April 2006 survey suggested a wintering population of approximately 1,200 bowhead whales off West Greenland. A reanalysis of survey data collected in eastern Canada during the summers of 2002–2004 was under way at the end of 2006, and it was expected to produce a substantially higher estimate for the entire eastern Canada–West Greenland stock.

The small Okhotsk Sea stock is classified by the IUCN as endangered; no new information on this stock became available in 2006.

Mediterranean Monk Seal

The Mediterranean monk seal (*Monachus monachus*) is regarded as Europe’s most endangered marine mammal (Figure 20). It is listed as critically endangered by the IUCN and endangered under the U.S. Endangered Species Act. The Mediterranean monk seal is one of three modern species in the genus *Monachus*. The Caribbean monk seal (*M. tropicalis*) is considered extinct, and the Hawaiian monk seal (*M. schauinslandi*), with a population of only about 1,100 seals, is endangered. Significant threats to the Mediterranean monk seal include habitat degradation and loss, fisheries interactions (entanglement in fishing gear and, particularly, shooting by fishermen who perceive the monk



Figure 20. Mediterranean monk seal. Photograph © Matthias Schnellman, courtesy of The Monachus Guardian.

seal to be a pest and a competitor), disease (e.g., morbillivirus), harmful algal blooms, and disturbance.

The Mediterranean monk seal has been extirpated from most of its range, and the population is now highly fragmented. Recent estimates suggest a total population of perhaps 500 to 550, with approximately 300 to 350 in the eastern Mediterranean, 10 to 15 in the western Mediterranean, and 185 to 190 in the Atlantic. Survey data from Turkey resulted in an increase of 50 seals over previous estimates (for the eastern Mediterranean), but this likely reflects better survey data rather than an actual increase in the seal population. Before 1997 the largest single colony was at Côte des Phoques in Western Sahara on Africa's northwestern coast. A mass mortality at that site in 1997, attributed to either morbillivirus or saxitoxin, reduced the colony by one-half to two-thirds. Prior to the die-off, an average of 52 births took place in the breeding caves each year. In 1998 productivity of the colony had decreased to 24 pups. Following the establishment of a no-fishing zone in 2001 and the elimination of disturbances in the vicinity of the breeding caves, the number of animals (except pups) found dead on the beaches south of the colony has notably decreased, and the number of animals using the breeding caves and the number of adult males occupying territories near the reserve have increased. In 2004 and 2005 productivity increased slightly, and 29 pups were born each of those years. In 2006 productivity further increased to 48 pups. Monitoring in the breeding caves has been consistent over the years, and thus the increase cannot be attributed to increased observer effort. The increase is believed to be the result of the recruitment of new reproductive females into the population and stronger protection measures.

An international conference on Mediterranean monk seal management and recovery took place in Turkey on 17–19 September 2006. The conference focused on political, legal, and financial issues. Unfortunately, some key indi-

viduals involved in Mediterranean monk seal recovery efforts did not attend the workshop, so it is unclear whether significant progress was made. As in the past, monk seal research and protection efforts are plagued by a lack of international coordination and cooperation although efforts are being made to improve that situation.

Saimaa Seal

The Saimaa seal (*Phoca hispida saimensis*) is a subspecies of ringed seal found only in Lake Saimaa in southeastern Finland. Like other ringed seals, Saimaa seals maintain breathing holes through the ice in winter and make lairs in snowdrifts overlying these holes. Snowdrifts, however, form only along the shores of Lake Saimaa and around islands within the lake. As a result, seal lairs, including those used for giving birth and nursing pups, are all located near shore and thus are affected by shoreline development. The current population size is approximately 280 seals, including only 73 to 76 mature females. The subspecies is listed by the IUCN as endangered, and the European Union has designated Saimaa seals as needing strict protection. Hunting was allowed prior to 1955 and was considered the primary threat. In the 1960s and 1970s the effects of contaminants, mainly mercury, were viewed as the likely cause of low pup survival. More recently, entanglement in recreational fishing gear (gillnets) has become a significant source of mortality. In addition, development around the lake, associated disturbance, and water management practices are thought to be degrading habitat, altering ice conditions, and threatening birth lairs. In particular, abnormal variations in water levels can cause the ice near shore to break, disrupting and possibly collapsing seal lairs. If this occurs during the pupping season, pups can be exposed and their chances of survival reduced. Annual pup mortality is usually about 10 percent, but up to 44 percent of pups died in some years as a result of widespread lair disruption. Various measures have been

taken to control fishing seasons and locations, establish protected areas, manage water levels more conservatively, and raise awareness. As a result, the seal population has grown somewhat since 1990.

This trend may not continue, however, because in the past few years the conditions for lair construction have deteriorated, and shorter periods of ice cover and a lack of suitable snowdrifts have led to high pup mortality. Many pups have been observed on open ice or within open hollows in the snow that presumably were collapsed or melted lairs. If climate change results in reduced periods of snow cover (i.e., shorter times spent in lairs by pups), then the combination of bycatch and low pup survival may prevent the population's recovery. The continuation and elaboration of protection measures appear vital for the recovery of Saimaa seals.

Sirenians

The order Sirenia includes only one species of dugong, and three species and two subspecies of manatees (Table 11). Sirenians feed primarily on sea grasses and other submerged, floating, overhanging, or emergent vegetation in coastal, estuarine, and riverine habitats. Their distribution is coastal, and historically they have been vulnerable to hunting and trapping by humans

for food and other products. Sirenians are particularly vulnerable to habitat degradation associated with water management, agriculture, fishing, and other human activities related to coastal development. In 2004 the Marine Mammal Commission provided funds to the IUCN Sirenia Specialist Group to review the status of the world's sirenian species and update information for the IUCN Red List assessments (see the Commission's annual report for 2004). A workshop was convened to conduct this review on 1 August 2005 in conjunction with the Ninth International Mammalogical Congress.

The Red List status of sirenians had not been reviewed since the compilation of the 1996 IUCN Red List (in which all sirenians were classified as vulnerable), and the rationale and documentation supporting the 1996 classifications had never been compiled. Based on information presented at the 2005 workshop and additional data collected and analyzed in the ensuing months, the Sirenia Specialist Group provided a series of updated assessments and recommended classifications (Table 11). The recommended classifications and supporting data for the dugong and the West African manatee were accepted and included in the 2006 Red List. Additional clarification was requested to support the other recommendations, and the Sirenia Specialist Group subsequently

Table 11. Recommended IUCN Red List classifications for sirenians

Common Name	Taxonomy	Recommended Classification
Dugong	<i>Dugong dugon</i>	Vulnerable
Amazonian manatee	<i>Trichechus inunguis</i>	Vulnerable
West African manatee	<i>T. senegalensis</i>	Vulnerable
West Indian manatee	<i>T. manatus</i>	Endangered
Antillean manatee	<i>T. manatus manatus</i>	Endangered
Florida manatee	<i>T. m. latirostris</i>	Endangered

provided the necessary clarification in time to update the classifications of all sirenians in the 2007 Red List.

Dugongs

The dugong (*Dugong dugon*) is the only extant member of the family Dugongidae. It occurs from East Africa to Vanuatu in shallow coastal waters between 26° N and 26° S latitudes. Although dugongs are still found in many parts of their historical range, they have been extirpated in much of that range and now generally occur in fragmented, declining populations. Sizeable dugong populations persist in only a few locations. Their nearshore habitat and dependence on sea grass for food make dugongs particularly vulnerable to human-caused mortality and habitat degradation.

A small dugong population still occurs along the northeastern coast of Okinawa. The exact size of this population is unknown, but fewer than a dozen animals have been sighted in recent surveys. The government of Japan has listed the Okinawa dugong population as a Natural Monument, reflecting its place as an important component of the culture and history of native Okinawans.

The governments of Japan and the United States have been considering possible sites on Okinawa for a new U.S. Marine Corps air station to replace the existing base at Futenma. The primary site under consideration prior to 2005 was near an existing U.S. Marine Corps base (Camp Schwab). The airstrip was to be built atop coral reefs and sea grass meadows used by dugongs. Construction of the base would have had harmful effects on dugongs due to physical disturbance, loss of sea grass meadows, pollution, noise, and watercraft activities. The IUCN recommended in 2000, and again in 2004, that Japan review the potential environmental effects of construction of the base, including pre-construction activities such as underwater drilling and seismic surveys, before initiating those activities. Japan initiated an environmental assessment of the original

base plan although the review apparently was never completed.

In September 2003 a coalition of conservation groups filed a lawsuit against the U.S. Department of Defense (*Okinawa Dugong v. Rumsfeld*). The plaintiffs requested that the Department comply with the National Historical Preservation Act by conducting a complete public assessment of the effects of the project on dugongs. While the case was proceeding, a preconstruction drilling survey was initiated in April 2004. Local protests against the base construction substantially hindered the drilling survey, stalling the project until September 2004 and disrupting the progress of the survey since then. In March 2005 the defendant's motion to dismiss was denied, and the court ruled that (a) base construction constituted a federal action and (b) the dugong was a cultural property of Japan entitled to protection under the National Historical Preservation Act.

In October 2005 the government of Japan and the U.S. Department of Defense decided to relocate the planned base closer to shore. The new plan calls for an airstrip to be built on "reclaimed land" surrounding the peninsula that currently hosts Camp Schwab. This plan would still require filling shallow nearshore waters, involving risks to nearby coral reefs and sea grass meadows. The extent to which the new plan reduces the potential for impacts on dugongs is not clear. It also is not clear whether an environmental assessment of the new plan has been initiated by either Japan or the U.S. Department of Defense. In May 2006 the United States and Japan reached a final agreement on realignment of U.S. troops in Japan. That agreement included the closing of the Futenma base and the construction of the facility on reclaimed land near Camp Schwab, effectively nullifying hopes that realignment negotiations might eliminate the need for the new facility. The lawsuit against the U.S. Department of Defense (now *Okinawa Dugong v. Gates*) was still in litigation at the end of 2006.

Chapter VII

MARINE MAMMAL/FISHERIES INTERACTIONS

Fishing operations may disturb, harass, injure or kill marine mammals either accidentally or deliberately. Conversely, marine mammals may take or damage bait or fish caught on lines, in traps, or in nets; may damage or destroy fishing gear; or may injure fishermen trying to remove them from fishing gear. In addition, marine mammals and fisheries may compete for the same fish and shellfish resources. Interactions between fisheries and marine mammals are regulated primarily under provisions of the Magnuson-Stevens Fishery Conservation and Management Act and the Marine Mammal Protection Act but also may be regulated under the Endangered Species Act.

This chapter addresses efforts during 2006 to reauthorize the Magnuson-Stevens Act and the implications for conservation of marine mammals. Also discussed are the Commission's participation in the Atlantic Large Whale Take Reduction Team, the Pelagic Longline Take Reduction Team, and the Atlantic Trawl Gear Take Reduction Team, as well as pinniped/fishery interactions at Bonneville Dam and tuna/dolphin interactions in the eastern tropical Pacific Ocean.

Reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act was enacted in 1976 and is the primary legislation governing the management of fisheries in the United States. The Act was intended to conserve and manage U.S. fishery resources and promote the development of domestic fisheries to replace foreign fishing within U.S. waters. The Act created a 200-nmi Exclusive Economic Zone contiguous to the territorial sea of the United States and extending offshore from all U.S. possessions and trust territories. Effective in 1977, all fishery resources within the Exclusive Economic Zone that did not fall under state jurisdiction came under federal control. The Act created eight regional fishery management councils to assist the Secretary of Commerce in management of the nation's federal fishery resources.

In 1996 the Magnuson-Stevens Act was reauthorized and amended through enactment of the Sustainable Fisheries Act. The latter Act mandated the prevention of overfishing and the rebuilding of overfished stocks, strengthened bycatch reporting and mitigation requirements, and created new standards for protecting essential fish habitat. Under the Sustainable Fisheries Act, the Magnuson-Stevens Act was reauthorized through 1999. It was not subsequently reauthorized but remained in place absent further reauthorization. In 2005 Representative Richard Pombo introduced H.R. 5018, which was passed by the House of Representatives. A similar bill, S. 1012, sponsored by Senator Ted Stevens, was passed by the Senate in 2006. At the end of 2006 Congress passed a reconciled version of the two bills, which reauthorized the Magnuson-Stevens Act through 2013. In early 2007 the President was expected to sign into law the Magnuson-Stevens Fishery Conserva-

tion and Management Reauthorization Act of 2006 (Public Law 109-479).

The reconciled bill passed by Congress made key additions and several changes to the Magnuson-Stevens Act, including the establishment of a firm deadline to end overfishing in U.S. fisheries by 2011, the use of market-based incentives to replenish U.S. fish stocks through limited access privilege programs, improved methods to enforce existing fishing laws, and the incorporation of peer-reviewed scientific research to set catch limits. In addition, the bill called for the protection of deep-sea corals and sponges from destructive fishing gear and added provisions to improve international fishery management and conservation compliance, with an emphasis on strengthening controls on illegal, unreported, and unregulated fishing and to ensure that other nations provide comparable protection to populations of living marine resources at risk from high-seas fishing activities. The bill also established a regionally based program for developing technologies and methods to reduce bycatch (the definition of which was extended to include seabirds) and associated mortality, which may contribute to greater protection of marine mammals. The term “overfished” was replaced with “depleted” to reflect that factors other than fishing may contribute to the depressed condition of a fish stock and should be taken into account when determining the maximum sustainable yield or recovery goal of a particular stock. The bill also requires that new members of the fishery management councils be given training in the biological, ecological, socioeconomic, and cultural issues pertaining to the fisheries they manage. The bill authorizes \$338 million in fiscal year 2007, with 3 percent annual increases thereafter, for implementation of Magnuson-Stevens Act provisions.

Despite these improvements, critics of the amendments believe that some changes weakened certain aspects of the Magnuson-Stevens Act. The revised Act limits opportunities for public participation and access to some types of

information, including summary information from observers and vessel monitoring systems. It does not provide for independent public seats on the councils and, although it requires that catch limits be established at or below the level recommended by the regional fishery management council’s scientific and statistical committee, it does not ensure independent scientific advice since it does not prohibit committee members from having financial ties to the fishing industry and does not require that members be appointed by the National Marine Fisheries Service, rather than by the councils. However, both council and committee members must disclose any financial arrangements that they have with anyone who may have an interest in the activities over which the council presides.

The revised Act also allows the Secretary of Commerce to waive analytical and public participation requirements of the National Environmental Policy Act if the Secretary determines that the fishery management plan or amendment at issue has been prepared in accordance with the applicable provisions of the Magnuson-Stevens Act. Although the Act directs fishery management councils to establish annual fishing quotas aimed at ending overfishing by 2010 for stocks currently being overfished and by 2011 for all other federally managed fish stocks, it also allows extensions of the time limits to rebuild depleted fish stocks if they cannot be rebuilt during the allotted time.

The Act is designed to minimize financial hardships for local fisheries and fishing communities through the development of limited-access privilege programs. The resulting quota shares are not subject to term limits, and therefore certain fishing interests may gain exclusive access to fish resources in perpetuity. Those limited-access privilege programs that are currently under development are exempt from the new standards. Opponents to these provisions have claimed that such programs do not adequately prevent large operators from dominating a fishery to the detriment of the interests

of small-scale fishermen because an access program can be granted at the request of holders of 50 percent of the allocation, instead of by 50 percent of permit holders.

Take Reduction Teams

In 1994 the Marine Mammal Protection Act was amended to establish a new regime for managing the incidental take of marine mammals by commercial fisheries. Those amendments require that the National Marine Fisheries Service assess and prepare reports on each marine mammal stock in U.S. waters, including its potential biological removal (PBR) level. PBR is the number of individuals that could be taken annually from each stock (not including natural mortality) while still providing a high level of assurance that the stock would increase to, or remain at, its optimum sustainable population level. If the level of taking by a fishery, which must include both deaths and serious injuries, exceeds a stock's calculated PBR, or if the stock is listed or likely to be listed as endangered or threatened under the Endangered Species Act or is depleted under the Marine Mammal Protection Act, it is to be identified as a "strategic stock." For strategic stocks, the Service must appoint and convene a take reduction team to help identify necessary mitigation measures.

Take reduction teams are composed of representatives of involved fisheries, as well as concerned environmental interest groups, government agencies, and the scientific community. Under the Marine Mammal Protection Act, the teams are charged with recommending measures that the Service should include in take reduction plans that will reduce incidental take to levels below PBR within six months of a plan's implementation. Within five years, plans must reduce marine mammal takes to levels approaching a zero serious injury and mortality rate (i.e., the zero mortality rate goal or ZMRG). The Service currently considers incidental take levels that are 10 percent or less of a stock's PBR as satisfying the zero serious injury and mortality rate goal.

Since 1996 the National Marine Fisheries Service has convened eight take reduction teams (Table 12). Past activities of teams established before 2005 are discussed in the Commission's previous annual reports. As a result of reductions in incidental take levels, some of those teams (such as the two harbor porpoise teams and the two offshore cetacean teams) have been inactive for several years.

In 2006 the Service convened meetings of the Atlantic Large Whale Take Reduction Team, the Pelagic Longline Take Reduction Team, and the newly formed Atlantic Trawl Gear Take Reduction Team. A representative of the Marine Mammal Commission participates on each of these teams.

Atlantic Large Whale Take Reduction Team: The North Atlantic right whale, along with several other large whale species listed as endangered under the Endangered Species Act, are prone to entanglement in buoy lines, ground lines, and other gear used in commercial gillnet, lobster trap, and other trap fisheries off the U.S. East Coast. Although entangled whales are sometimes able to shed such gear on their own and without injury, some animals are unable to do so. Those that remain entangled may weaken and drown from the drag or constriction of attached gear or sustain injuries that can cause disability or lethal infections. In 1996 the National Marine Fisheries Service convened a take reduction team to recommend measures to reduce such interactions. Because of their highly endangered status, the Service has established a PBR level of zero for North Atlantic right whales, and this team has focused almost all of its attention on measures to prevent the incidental take of that species.

Based on initial team meetings, the Service adopted a take reduction plan in 1998. The plan imposed measures that required certain gear characteristics or modifications to reduce the probability that whales would become entangled. Since then, incidental take levels do not appear to have declined. The Service has reconvened the team periodically and

Table 12. Take reduction teams established under the Marine Mammal Protection Act to reduce the incidental take of marine mammals in commercial fisheries

Take Reduction Team	Focus	Date Established
Gulf of Maine Harbor Porpoise	Take of harbor porpoises in various New England gillnet fisheries to catch groundfish, monkfish, and sharks	1996
Atlantic Large Whale	Take of right, humpback, fin, sei, and sperm whales in various gillnets and traps to catch groundfish, lobster, and other species	1996
Pacific Offshore Cetacean	Take of pilot whales, sperm whales, pygmy sperm whales, and humpback whales in swordfish drift gillnets	1996
Atlantic Offshore Cetacean	Take of right whales, humpback whales, sperm whales, beaked whales, pilot whales, common dolphins, and bottlenose dolphins in pelagic drift net, longline, and pair-trawl fisheries	1996
Mid-Atlantic Harbor Porpoise	Take of harbor porpoises in gillnets used to catch various coastal finfish species	1997
Bottlenose Dolphin	Take of bottlenose dolphins in gillnets, traps, seines, and pound nets used to catch various coastal finfish off the mid-Atlantic states	2001
Atlantic Pelagic Longline	Take of pilot whales and Risso's dolphins in pelagic longlines used to catch swordfish, sharks, and tuna	2005
Atlantic Trawl Gear	Take of pilot whales, common dolphins, and white-sided dolphins in trawls used to catch various finfish and shellfish	2006

made numerous changes to its take reduction measures. In 2003 another major revision of the plan was initiated. Final measures for that revision have not yet been adopted. In April 2006 a southeast subgroup of the team met to discuss measures that should be taken in response to a right whale killed in a gillnet early in 2006. In addition, in December 2006 the Service convened the entire Atlantic Large Whale team to seek advice on additional measures to prevent entanglement of whales in buoy lines used to mark locations and haul gear in gillnet and trap fisheries. Results of those meetings and the status of revisions to the Atlantic Large Whale Take Reduction Plan are discussed in the North Atlantic right whale section in Chapter VI.

Atlantic Pelagic Longline Take Reduction Team: This team was convened in 2005 to address incidental takes of marine mammals in the Atlantic pelagic longline fishery. It was convened as part of a settlement agreement in response to a lawsuit brought in 2002 by the Center for Biological Diversity and Turtle Island Restoration Network against the National Marine Fisheries Service. The agreement called for the formation of two take reduction teams to address takes of short-beaked common dolphins (*Delphinus delphis*) and both long-finned and short-finned pilot whales (*Globicephala melas* and *G. macrorhynchus*, respectively) in the longline fishery (this team) and in Atlantic trawl fisheries (the Atlantic Trawl Gear Take Reduction Team).

Although the team originally was convened to address pilot whale and common dolphin takes under the settlement agreement, no common dolphin takes had been observed in the longline fishery in the past five years. As a result, the team focused on the two species of pilot whales. Long-finned and short-finned pilot whales are virtually indistinguishable in the field; therefore, the National Marine Fisheries Service currently manages the two species as one species complex. Both abundance and incidental take rates are estimated for the two species together (Table 13). Risso's dolphins (*Grampus griseus*) and pygmy sperm whales (*Kogia breviceps*) also are taken in the pelagic longline fishery. The estimated take rates for pilot whales (both species together) and for Risso's dolphins are less than PBR but above ZMRG (Table 13). However, those estimated rates are based on observer interactions with mid-water trawl fisheries and do not include takes of pilot whales in bottom-trawl fisheries. At the end of 2006 the Service was analyzing available data to provide an estimate of marine mammal takes in bottom-trawl fisheries. The estimated incidental take rate of pygmy sperm whales exceeds PBR, although that rate is based

on only one observed take in the past five years (Table 13). After reviewing the available information on take rates and PBR values, the team agreed to include Risso's dolphins within the scope of the take reduction plan, while maintaining a focus on pilot whales. The team did not address takes of pygmy sperm whales.

The longline team met four times between June 2005 and May 2006, and on 8 June it submitted a draft recommended take reduction plan to the Service. The draft plan recommended both non-regulatory and regulatory measures. The non-regulatory measures included recommendations to increase observer coverage for the fishery, encourage vessel operators to maintain communications with other vessels on take levels, update marine mammal handling guidelines, distribute quarterly bycatch reports to team members, and collect certain data necessary to evaluate progress on plan implementation. With regard to regulatory measures, the team recommended that the Service—

- designate Cape Hatteras as a special research area in which fishing vessels would have to be willing and able to participate in research and carry an observer if asked to do so;

Table 13. Abundance and incidental take information for marine mammals affected by Atlantic pelagic longline and trawl fisheries

Species	Abundance	Longline	Estimated takes Mid-water trawl	Total ¹	PBR
Short-beaked common dolphin	120,473	0	0	>0	1,000
Pilot whale ²	31,139	70	9	>90	249
Pygmy sperm whale ³	395	6	0	6	2
Risso's dolphin	20,479	49	0	52	124
Atlantaic white-sided dolphin	51,640	0	29	>55	379

¹Total estimated takes include some takes from fisheries not depicted elsewhere in the table; ">" indicates that additional takes were observed in bottom-trawl fisheries, but estimated takes for those fisheries were not available.

²Estimated abundance and PBR are for long-finned and short-finned pilot whales combined.

³Estimated abundance and PBR are for pygmy and dwarf sperm whales combined.

Data courtesy of National Marine Fisheries Service stock assessment reports for 2006.

- limit the length of longlines to 20 nmi (but not the number of longlines set);
- require posting of voluntary marine mammal handling guidelines on deck and in the wheelhouse of all vessels; and
- institute a mandatory certification program for operators of all longline vessels to ensure that they are aware of take reduction measures and procedures.
- At the end of 2006 the Service was reviewing the team's recommendations and was in the process of preparing a draft take reduction plan with accompanying regulations to be circulated for public and agency review.

Atlantic Trawl Gear Take Reduction Team—This team was convened in 2006 to address incidental takes of marine mammals in Atlantic mid-water and bottom-trawl gear fisheries. As mentioned previously, the team was convened under a settlement agreement in response to a lawsuit brought by the Center for Biological Diversity and Turtle Island Restoration Network against the National Marine Fisheries Service in 2002. The agreement called for the formation of two take reduction teams to address takes of short-beaked common dolphins and both long-finned and short-finned pilot whales in the longline fishery (see earlier discussion) and in Atlantic trawl fisheries (this team).

At its initial meeting, the team reviewed information on the status and incidental take rates of the affected marine mammal stocks, observer efforts for the trawl fisheries, the incidental take of sea turtles, the status of the fisheries and related management measures, and ongoing research into gear modifications to reduce incidental takes of marine mammals in trawl gear. The team also identified additional data necessary for managing the incidental take of marine mammals in trawl gear. The estimated take rates for pilot whales (both species together) and common dolphins are less than PBR but above ZMRG (Table 13). However, those estimated rates are based on observer interactions with mid-water trawl fisheries and

do not include takes of pilot whales in northeast and mid-Atlantic bottom-trawl fisheries. At its first meeting, the team recommended inter alia that the Service expedite the estimation of take rates for those bottom-trawl fisheries. Atlantic white-sided dolphins (*Lagenorhynchus acutus*) also are taken in Atlantic trawl fisheries, and the team is considering whether to include the species within the scope of the take reduction plan. At the end of 2006 it was expected that the team would continue its efforts to complete a draft recommended take reduction plan for Atlantic trawl fisheries in 2007.

Pinniped/Fisheries Interactions: Bonneville Dam

Certain seal and sea lion populations in U.S. waters have increased substantially since passage of the Marine Mammal Protection Act. Reports of seal and sea lion interactions with commercial fisheries and protected stocks of salmon also have increased, especially on the West Coast of the United States. In 1994 Congress added section 120 to the Marine Mammal Protection Act to address concerns about predation on depleted salmonid stocks. Section 120 allows states to apply to the Secretary of Commerce for authorization to lethally take individually identifiable pinnipeds that are having a significant negative effect on the recovery of salmonid fishery stocks. These fish stocks must either be (1) listed under the Endangered Species Act, (2) approaching threatened or endangered status, or (3) migrating through the Ballard Locks at Seattle, Washington. Section 120 requires review of the situation described in the states' application and formation of a pinniped-fishery interaction task force if the Secretary determines that an application has produced sufficient evidence to warrant its establishment. The task force evaluates the situation, assesses whether the pinnipeds are having a "significant negative impact" on the decline or recovery of the particular fish stocks and provides its recommendations to the National Marine Fisheries Service.

From 1994 to 2005 only one application for lethal taking of pinnipeds was submitted to the National Marine Fisheries Service. In July 1994 the state of Washington sought authorization for intentional lethal taking of individually identifiable California sea lions preying upon wild stocks of steelhead trout migrating through the Ballard Locks in Seattle. In November 1995 the Service granted the Washington Department of Fish and Wildlife authority to use lethal methods to remove nuisance pinnipeds. However, the authorization required that, among other things, the state first attempt to remove the pinnipeds using non-lethal methods and that lethal means be used only if predation exceeded 10 percent of the available steelhead trout run in any consecutive seven-day period. Captured sea lions were to be euthanized humanely. The state of Washington never invoked the authority granted for lethal taking; instead, the problem was addressed by capturing, marking, and transporting the individually identified nuisance sea lions and either releasing them into the wild in a different location or placing them in permanent captivity.

In recent years, increased numbers of pinnipeds have been observed at Bonneville Dam in the Columbia River, where some individuals have learned to prey on spring runs of adult salmonids as they congregate to pass through the dam's fish ladders. With support from the Service and the state of Washington, the Oregon Department of Fish and Wildlife has captured and marked California sea lions near the mouth of the Columbia River at Astoria during 1997 to 2006. In addition, the Army Corps of Engineers' Fisheries Field Unit conducted evaluations of the seasonal presence and abundance of pinnipeds in the Bonneville Dam tailrace, including surface observations of pinniped consumption of salmon during spring 2002–2006. Pacific harbor seals, Steller sea lions, and California sea lions were sighted at the dam from 2002 through 2006. Harbor seals and Steller sea lions were judged not to be a significant source of mortality for endangered salmonids due to their small numbers.

In 2004 the Service, Corps, Washington Department of Fish and Wildlife, Oregon Department of Fish and Wildlife, and Columbia River Inter-Tribal Fish Commission met to discuss non-lethal deterrent actions to stop pinniped predation on salmonids at Bonneville Dam. The four state and federal agencies decided to test the effectiveness of existing non-lethal methods for excluding sea lions from the fish passage facility and deterring them from entering the tailrace at Bonneville Dam. Preliminary efforts took place in 2005 and more extensive hazing programs were attempted in 2006. Steller sea lions showed a favorable response to deterrence. However, the states contended that non-lethal hazing methods carried out in the vicinity of Bonneville Dam had had only limited success in reducing the number of California sea lions and their predation rates and that the sea lions' foraging habits were having a significant negative impact on the recovery of Columbia River salmonid stocks.

On 5 December 2006 the National Marine Fisheries Service received from the states of Washington, Oregon, and Idaho an application for lethal taking of individually identifiable California sea lions at Bonneville Dam. The application called on the Service to form a task force, as specified by Section 120(c)(1) of the Marine Mammal Protection Act. The Secretary of Commerce has 15 days after receiving such an application for authorization of lethal taking of pinnipeds to determine whether the circumstances warrant establishing a pinniped-fishery interaction task force. At the end of 2006 the Service was still reviewing the application.

Certain members of the U.S. House of Representatives also sought to reduce pinniped predation on endangered or threatened stocks of Columbia River salmonids by introducing legislation that would amend the Marine Mammal Protection Act. H.R. 6241, introduced on 28 September 2006, sought to amend the Act by temporarily authorizing the intentional lethal taking of up to 1 percent of the annual potential biological removal level of California sea lions

(83 animals, according to the Service's 2003 California sea lion stock assessment report) on the Columbia River or its tributaries. H.R. 6241 would grant the Secretary of Commerce authority to issue permits for lethal taking of California sea lions to eligible entities, including the states of Washington and Oregon and various Native American tribes, if the Secretary determines that alternative measures have not adequately protected the salmonid stocks. Each permit issued to an eligible entity would remain valid for one year and authorize the intentional lethal taking of up to 10 California sea lions, with each entity being eligible to receive multiple permits. The Secretary would cease to issue permits for intentional lethal taking of California sea lions at the end of a three-year period. H.R. 6241 was not enacted, and the Subcommittee on Fisheries Conservation, Wildlife, and Oceans of the House Resources Committee did not hold hearings on Marine Mammal Protection Act reauthorization issues, such as removal and control of nuisance pin-nipeds, in 2006.

The Tuna-Dolphin Issue

For reasons not fully understood, schools of large yellowfin tuna (those greater than 25 kg, or 55 lbs) tend to associate with dolphin schools in the eastern tropical Pacific Ocean. This area covers more than 18.1 million km² (5 million mi²), stretching from southern California to Chile and westward to Hawaii. Late in the 1950s U.S. fishermen began to exploit this association by deploying large purse seine nets around dolphin schools to catch the tuna swimming below. Despite efforts by fishermen to release the dolphins unharmed, many animals became trapped in the nets and were killed or injured. Estimated dolphin mortality in the early years of the fishery was in the hundreds of thousands per year, resulting in the sharp reduction of several stocks. Efforts to reduce the incidental mortality of dolphins in this fishery have been a primary focus of the Marine Mammal Protection Act since its enactment in 1972. As a

result of these efforts, direct incidental mortality now averages fewer than 2,000 dolphins per year. Nevertheless, at least two dolphin stocks that had been significantly reduced by the fishery—the northeastern offshore spotted dolphin (*Stenella attenuata*) and the eastern spinner dolphin (*Stenella longirostris*)—have not exhibited the population growth rates one would expect given the observed reduction in mortality, and the stocks remain depleted. More recently, efforts have focused on identifying the possible insidious effects of chasing and encircling large numbers of dolphins in the tuna fishery each year—effects that may not be reflected in the reported mortality figures but that may be impeding the recovery of depleted dolphin stocks.

The fishery, which was once dominated by U.S. vessels, has evolved into one largely carried out by foreign fleets. As such, efforts to conserve the marine mammal stocks affected by the fishery have taken on an increasingly international focus. Those efforts include the development and implementation of international agreements and the enactment of domestic legislation that ties access to the still-substantial U.S. tuna market to compliance with those agreements. In addition, and perhaps more important, U.S. legislation establishes standards as to what tuna may be labeled as being “dolphin-safe,” a label that makes the product much more attractive to U.S. consumers.

The Eastern Tropical Pacific Tuna Fishery

At the height of U.S. participation in the eastern tropical Pacific tuna fishery during the mid-1970s, more than 110 large purse seine vessels flagged in the United States engaged in the practice of setting on dolphins to catch tuna. By the mid-1980s that number had dropped to fewer than 50. In 2006 only four U.S. purse seine vessels appeared on the vessel registry maintained by the Inter-American Tropical Tuna Commission as being authorized to fish for tuna in the eastern tropical Pacific Ocean. Of these, one was removed from the list early in

the year before any fishing occurred and one did not fish at all during 2006. Neither of the other two registered U.S. vessels intentionally set on schools of dolphins during the year. In fact, no U.S. vessel has intentionally set on dolphins since 1994. Although some accidental marine mammal deaths may occur when purse seine nets are deployed on schools of tuna that are not associated with large schools of dolphins, none was reported in 2006 in conjunction with U.S. fishing operations. The most recent deaths attributed to the U.S. fleet involved five rough-toothed dolphins (*Steno bredanensis*) in 2002.

Concurrent with the decline in the U.S. fleet in the eastern tropical Pacific, foreign capacity in the fishery was growing. In 1980, just before the precipitous decline of the U.S. fleet began, there were about 80 large purse seine vessels (those greater than 425 m³ in well volume—roughly 400 short tons [363 metric tons] or more in capacity) in the foreign fleet. Information provided by the Inter-American Tropical Tuna Commission (www.iattc.org/Vessel-Register/VesselList.aspx?List=Reg_Vessels&Lang=ENG) indicates that currently about 165 large purse seine vessels participate in the fishery. The largest fleets belong to Ecuador (44 vessels), Mexico (42), Panama (25), Venezuela (21), and Colombia (10).

The growth in overall fleet capacity during the 1990s prompted the Inter-American Tropical Tuna Commission—the international fishery organization with responsibility for oversight of the fishery—to adopt a resolution in 2002 capping the size of the international fleet and establishing a vessel registration requirement. Under that resolution, only vessels that participated in the fishery prior to 28 June 2002 may be registered, except for new registrants to replace vessels removed from the register. However, replacement vessels cannot exceed the capacity of the vessels being replaced. Under the Inter-American Tropical Tuna Commission program, the capacity of the international fleet eligible to purse seine for tuna in the eastern tropical Pacific is limited to the capacity of

vessels under the jurisdiction of tuna commission parties with a history of participating in the fishery prior to 28 June 2002. The United States further placed a voluntary limit on the aggregate active capacity of U.S. purse seine vessels in the area to 8,969 metric tons per year, the equivalent of about 25 vessels with a capacity of 363 metric tons each. In addition, the Inter-American Tropical Tuna Commission resolution allows up to 32 U.S. vessels licensed to fish for tuna in the western Pacific Ocean to each make a single fishing trip of not more than 90 days in the eastern tropical Pacific without being counted against the fleet capacity limit.

Not only has overall fleet capacity increased in recent years, but so too has the number of sets being made on schools of dolphins (Figure 22). The largest number of sets on dolphins made in any year, 13,839, occurred in 2003. The number of sets on dolphins made in 2002, 2004, and 2006 also were among the highest on record, surpassed only in 2003 and 1989. Fishing effort on schools of dolphins declined in 2006 to 8,923 sets. This decline seems to be related to a reduction in the number of yellowfin tuna being recruited in the fishery and an associated drop-off in the catch of tuna associated with dolphins, particularly in offshore areas.

The decline in the number of sets being made, coupled with the low reported incidental mortality rate (0.1 dolphin per set), resulted in a record low number of 886 reported dolphin deaths incidental to the fishery in 2006. The reported number of dolphins killed in the course of fishing for tuna in the eastern tropical Pacific Ocean remains well below the aggregate dolphin mortality limit of 5,000 per year allowed under the Agreement on the International Dolphin Conservation Program (Table 14). Although this level of mortality is believed not to be biologically significant to the affected dolphin stocks, there is concern that stress and its related impact associated with the chase and capture of dolphins in the course of catching tuna may be adversely affecting the ability of depleted dolphin stocks to recover. As such, re-

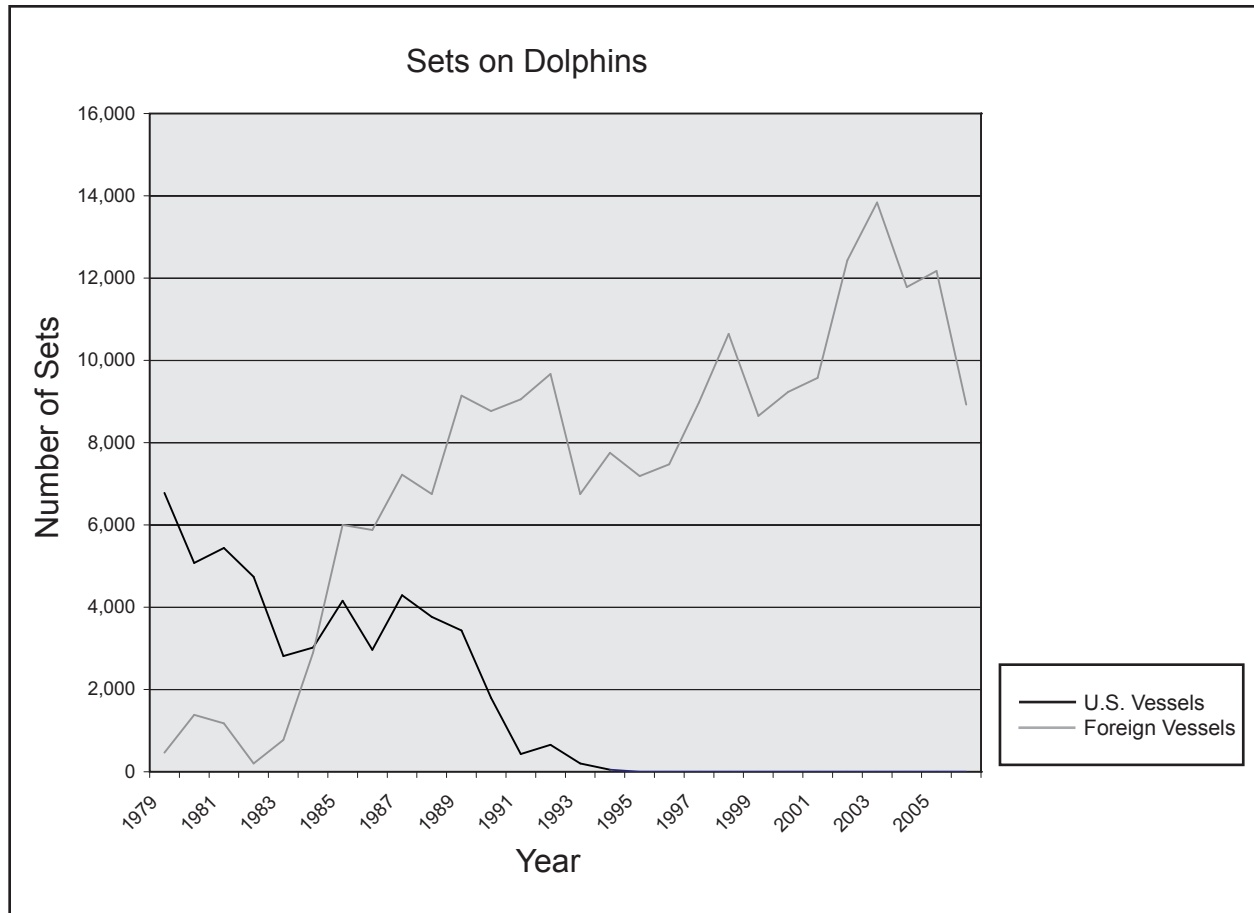


Figure 21. Sets on dolphins by U.S. and foreign fleets, 1979-2006.

cent increases in the number of sets being made on dolphins remain a cause for concern.

Another issue that has garnered increasing attention in recent years is the size of vessels capable of making sets on schools of dolphins and that should be covered by dolphin protection programs. Historically, the regulatory agencies and Congress believed that only vessels of greater than 400 short tons carrying capacity could successfully make sets on dolphins. This is reflected both in domestic legislation and in international agreements. For example, the National Marine Fisheries Service, in regulations implementing the dolphin-safe labeling requirements of the Marine Mammal Protection Act, has used the 400-short-ton threshold to define what constitutes a large purse seine vessel, which in turn determines whether documentation as to how tuna were caught is required

before it can be labeled as dolphin-safe. Also, the general requirement to carry observers only applies to vessels of greater than 400 short tons carrying capacity. However, a growing body of evidence indicates that some smaller vessels have been setting on dolphins. According to the Inter-American Tropical Tuna Commission, approximately 300 sets on dolphins have been made by vessels smaller than 400 short tons since 1987. In response to this concern, parties to the Agreement on the International Dolphin Conservation Program adopted a resolution in October 2002 specifying that any vessel of 400 short tons or less carrying capacity identified as having intentionally set its nets on dolphins will be required to carry an observer on subsequent fishing trips.

The 2004 Consolidated Appropriations Act (Pub. L. 108-447) funded the National Marine

Table 14. Estimated incidental kill¹ of dolphins in the tuna purse seine fishery in the eastern tropical Pacific Ocean, 1972–2006

Year	U.S. Vessels	Non-U.S. Vessels
1972	368,600	55,078
1973	206,697	58,276
1974	147,437	27,245
1975	166,645	27,812
1976	108,740	19,482
1977	25,452	25,901
1978	19,366	11,147
1979	17,938	3,488
1980	15,305	16,665
1981	18,780	17,199
1982	23,267	5,837
1983	8,513	4,980
1984	17,732	22,980
1985	19,205	39,642
1986	20,692	112,482
1987	13,992	85,185
1988	19,712	61,881
1989	12,643	84,403
1990	5,083	47,448
1991	1,002	26,290
1992	439	15,111
1993	115	3,601
1994	105	4,095
1995	0	3,274
1996	0	2,547
1997	0	3,005
1998	24	1,853
1999	0	1,348
2000	0	1,636
2001	0	2,129
2002	0	1,513
2003	0	1,502
2004	0	1,469
2005	0	1,151
2006	0	886 ²

¹ These estimates, based on kill per set and fishing effort data, are provided by the National Marine Fisheries Service and the Inter-American Tropical Tuna Commission. They include some, but not all, seriously injured animals released alive.

² Preliminary estimate.

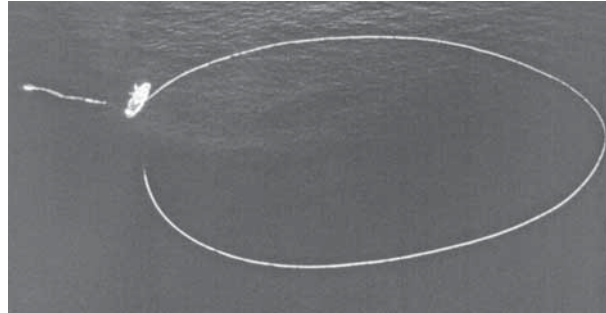


Figure 22. An open purse of a tuna purse seine in the eastern tropical Pacific Ocean. Photo courtesy of National Oceanic and Atmospheric Administration and South Pacific Commission.

Fisheries Service’s activities related to its tuna-dolphin program for fiscal year 2005. That legislation directed the Service to dedicate some of the funding toward “revising downward its definition of a vessel that is not capable of setting on or encircling dolphins to reflect the fact that vessels smaller than 400 short tons are known to engage in this practice.” The capability of a vessel to fish for tuna by setting on dolphins depends on more than just its carrying capacity. This is reflected in a preliminary analysis prepared by the Inter-American Tropical Tuna Commission in 2005 that examined the potential for developing a statistics-based system for identifying which smaller vessels may have set on dolphins. Such a system would look not only at vessel size but also would consider information on fishing practices, gear characteristics, catch composition, location of fishing operations, and environmental variables.

To pursue this matter, the Service entered into a contract with the Inter-American Tropical Tuna Commission to expand its at-sea observer program and in-port sampling program to collect information related to the types of sets being made by these smaller vessels. During 2006 the Tuna Commission sampled 189 landings of fish from Class 4 and 5 vessels (those with a well volume of between 213 and 425 m³) to assess the frequency with which yellowfin tuna of different sizes are caught using different fishing methods. However, not all flag states

with Class 4 and 5 vessels have agreed to allow their vessels to be sampled under the program. In addition, no flag state has agreed to have observers placed voluntarily on its smaller purse seine vessels.

The Service and the Tuna Commission also are exploring whether information from the landings of larger tuna vessels can be used to help identify the fishing practices of smaller vessels. Because these vessels are required to carry observers, ample data are available to relate the type of set being made with the size and species of the tuna it catches. Assuming that the fishing dynamics of large purse seine vessels are similar to those of smaller vessels, the Service hopes to develop a classification algorithm that allows it to identify the type of sets made by a vessel based on the species and length-frequency of the tuna it catches. Further investigations are planned for 2007.

The International Dolphin Conservation Program Act

In 1995 representatives of the United States and 11 other nations signed an agreement, the Declaration of Panama, setting forth their intention to formalize and make binding some of the steps that had been taken voluntarily to reduce incidental dolphin mortality in the tuna fishery. Implementation of the declaration was contingent on the enactment of changes in U.S. law. It called on the United States to open its market to all tuna caught in compliance with the agreement, whether caught by setting on dolphins or not, and to redefine “dolphin-safe” tuna to include tuna caught in the eastern tropical Pacific by a purse seine vessel in a set in which no dolphin mortality was observed. The formal international agreement envisioned under the Declaration of Panama, the Agreement on the International Dolphin Conservation Program, was concluded in May 1998 and entered into force in February of the following year.

Prior to concluding the Agreement on the International Dolphin Conservation Program, the United States enacted some, but not all, of

the changes identified in the Declaration of Panama. Most notably, the International Dolphin Conservation Program Act (Public Law 105-42) made changes to the definition of dolphin-safe tuna contingent on the results of research into the effects of the chase and encirclement that occurs in the course of purse seine fishing on the affected dolphins and dolphin stocks. Only if the National Marine Fisheries Service determined that chase and encirclement were having no significant adverse effects would the definition of dolphin-safe tuna be changed to include all tuna harvested in sets in which no dolphin mortality or serious injury was observed. The Service, on 31 December 2002, issued a finding, based on the results of its research and other relevant information, that deploying purse seine nets and encircling dolphins in the fishery are not having a significant adverse effect on any depleted dolphin stock. Further information concerning the research program and the finding can be found on the Service’s Web site (<http://.swr.nmfs.noaa.gov/tmm.htm>).

Litigation

Almost immediately after release of the Service’s final finding on the effects of chase and encirclement, environmental organizations filed suit in the U.S. District Court for the Northern District of California challenging the finding (*Earth Island Institute v. Evans*), claiming that it was not supported by the research results and other information and, therefore, that it was arbitrary and not in accordance with the applicable law. In a 9 August 2004 ruling, the court ruled in favor of the plaintiffs, finding that the Service had failed to pursue some of the mandated studies diligently and that decision-makers had been influenced by political and policy concerns rather than relying on the best available scientific evidence as required by the International Dolphin Conservation Program Act. The court directed that the term “dolphin-safe” continue to mean that “no tuna were caught on a trip in which such tuna were harvested using a purse seine net intentionally

deployed on or to encircle dolphins, and that no dolphins were killed or seriously injured during the sets in which the tuna were caught.”

The United States filed a notice of appeal of the district court’s ruling on 6 October 2004 (now *Earth Island Institute v. Gutierrez*). Oral argument before the Ninth Circuit Court of Appeals was held on 16 November 2006, and a decision is expected in the first half of 2007.

Affirmative Findings and Embargoes

The regulations implementing the International Dolphin Conservation Program Act set forth procedures and criteria for making affirmative findings for tuna-harvesting nations. Only countries with such a finding are permitted to import yellowfin tuna and yellowfin tuna products harvested in the eastern tropical Pacific into the United States. An affirmative finding is made for a five-year period but is subject to annual review to determine whether the exporting country is continuing to meet its obligations under the International Dolphin Conservation Program and responsibilities of membership in the Inter-American Tropical Tuna Commission.

In 2005 the National Marine Fisheries Service issued new findings for Ecuador, Mexico, and Spain, giving them access to the U.S. market through 31 March 2010, contingent on annual renewals. The Service published renewal notices in the *Federal Register* for Spain and Mexico on 7 April 2006 and for Ecuador on 14 April 2006. The only other country with an affirmative finding is El Salvador. Notice that its affirmative finding had been renewed was published by the Service on 20 July 2006. Embargoes remain in place for the other countries that fish for tuna in the eastern tropical Pacific Ocean—Belize, Bolivia, Colombia, Guatemala, Honduras, Nicaragua, Panama, Peru, Vanuatu, and Venezuela.

Tuna embargoes also are to be imposed against nations that import yellowfin tuna from harvesting countries embargoed from importing tuna directly into the United States. Such embargoes prevent nations from gaining access to the U.S. market for their tuna by shipping through a secondary nation. Currently, no intermediary nation embargoes are in place.

Chapter VIII

INTERNATIONAL ASPECTS OF MARINE MAMMAL CONSERVATION AND MANAGEMENT

The Departments of Commerce, the Interior, and State, in consultation with the Marine Mammal Commission, are instructed by section 108 of the Marine Mammal Protection Act to protect and conserve marine mammals under existing international agreements and to negotiate additional agreements as needed to achieve the purposes of the Act. Furthermore, section 202 of the Act requires that the Marine Mammal Commission recommend to the Secretary of State and other federal officials appropriate policies regarding international arrangements for protecting and conserving marine mammals.

During 2006 the Commission was involved in a number of international efforts to protect and conserve marine mammals. Several of these efforts, including a review of the potential effects of oil and gas development on the critically endangered western gray whale and efforts to protect and conserve the baiji and the vaquita, are discussed in the international species section in Chapter VI of this report. During the year, the Commission continued to advise U.S. delegations to the International Whaling Commission and the Convention on International Trade in Endangered Species of Wild Fauna and Flora. The Commission also supported efforts to secure U.S. Senate ratification of the U.S.–Russia polar bear agreement. Those activities are discussed in the following sections.

International Whaling Commission

The International Whaling Commission (IWC) was established under the International Convention for the Regulation of Whaling of 1946. Its purpose is to oversee the conservation of the world's whale stocks by conducting a continuing review of the status of those stocks and modifying conservation measures as appropriate. At the end of 2006, 71 nations were members of the IWC. Those nations joining the IWC during 2006 included Cambodia, Guatemala, Israel, the Republic of the Marshall Islands, and Slovenia. The 2006 meeting of the IWC was held in St. Kitts from 16 to 20 June.

In 1982 the IWC established a moratorium on commercial whaling to promote the recovery of a number of whale stocks that

had been depleted. Norway, which lodged an objection to the moratorium at the time of its adoption, is not bound by it and continues to conduct commercial whaling. During 2006 Norway's 28 whaling vessels took 545 minke whales in the northeastern Atlantic Ocean. Iceland, which had left the IWC in 1992, was allowed to rejoin in 2002 with a reservation to the commercial whaling moratorium. On 17 October 2006 the Icelandic Fisheries Ministry announced its intention to authorize a resumption of commercial whaling. Although opposed by 25 IWC parties, including the United States, in a demarche sent in November 2006, Iceland subsequently authorized the killing of 30 minke whales and 9 fin whales during the 2006–2007 whaling season. As of the end of 2006 Icelandic whalers had taken 7 fin whales and 1 minke whale. As discussed later in this

section, Iceland also engaged in research whaling during 2006.

The Revised Management Scheme

Since the mid-1990s the IWC has attempted to develop a Revised Management Scheme (RMS) to guide the overall conservation of whales and the management of commercial whale harvests. The RMS would set forth the mechanisms by which harvest limits would be established and identify other practices needed to ensure that those limits are not exceeded. At the 2005 meeting, the IWC parties agreed to hold an intersessional meeting of the Working Group on the Revised Management Scheme and to convene the working group in conjunction with the 2006 IWC meeting to try to resolve the outstanding issues. After those meetings, however, the working group concluded that discussions on the RMS remained at an impasse and chose not to recommend future work on the matter within the IWC in the coming year.

In 2006 Japan pointed to the stalemate over completion of the RMS and introduced a paper calling for the “normalization” of the IWC. Japan believes that the IWC has become dysfunctional because of the divergent views of its members and that there is a need to return to what it sees as the core function of the convention, that is, “to provide for the proper conservation of whale stocks and thus make possible the orderly development of the whaling industry.” Many other countries shared Japan’s concern over the future of the IWC as a functional international organization, but some saw a very different path forward. Some countries stressed that a focus on conserving whale stocks was not in conflict with the original purposes of the convention and believed that the treaty needed to be “modernized” or “harmonized” with current views about conservation and sustainable use of marine resources and to reflect more recent international agreements and treaties.

In 2006 St. Kitts and Nevis introduced a resolution consistent with Japan’s position. That resolution expressed concern that the IWC had

failed to meet its obligations under the convention. It also declared a commitment to normalize the functions of the IWC based on the terms of the convention and other relevant law, the cultural diversity and traditions of coastal peoples, principles of sustainable use of resources, and the need for science-based policies. The resolution was adopted by a one-vote margin. Japan announced that it planned to hold a conference outside the auspices of the IWC but open to all IWC members “that respect the [convention] and wish to act in accordance with [its] provisions...” to consider how the IWC might be normalized. Such a conference is scheduled to be held early in 2007.

Scientific Research Whaling

The International Convention for the Regulation of Whaling allows scientific whaling to be conducted outside the management sphere of the IWC. Although the ultimate responsibility for issuing research permits rests with individual countries, the IWC’s Scientific Committee reviews all such permits. At its 2006 meeting the Scientific Committee agreed that the process it uses to review proposed research needs to be improved and it recommended that proponents of such proposals should submit information on (1) research objectives, (2) methods to address those objectives, (3) the potential effects of proposed catches on the whale stocks, and (4) provisions for cooperative research. The Scientific Committee expects to consider additional ways that the review process might be improved at its 2007 meeting.

In 2006 Japan reported on the first year of a two-year feasibility study for a new research program in Antarctic waters (JARPA II), indicating that 853 minke whales and 10 fin whales had been killed during the 2005–2006 season as part of the program. In 2006–2007 Japan intends to expand this program to include humpback whales. Japan has indicated that in subsequent years it may also take other whale species that are major predators of Antarctic krill. Japan also conducts research whaling in

the North Pacific aimed at studying the feeding ecology of whales. During 2006 Japan took 195 minke whales, 50 Bryde's whales, 100 sei whales, and 6 sperm whales under that program with 100 of the minke whales taken in pelagic waters and 95 from coastal areas. Iceland is the only other country that currently engages in research whaling. Although Iceland has expressed interest in taking minke whales, fin whales, and sei whales for feeding ecology studies, its whaling has been limited to minke whales. During 2006 Iceland killed 60 minke whales under its research program.

The issue of scientific whaling remains controversial within the IWC, with several nations, including the United States, believing that much of the research now being done could be accomplished using non-lethal alternatives. The United States has expressed the view that, if the moratorium on commercial whaling is to be lifted by the IWC, a mechanism needs to be adopted that would give the IWC authority to approve or disapprove proposals to take whales for scientific purposes.

Subsistence Whaling

The moratorium on commercial whaling does not apply to aboriginal subsistence whaling, which is managed under separate provisions. Currently, the IWC authorizes subsistence whaling from the following stocks: (1) the Bering-Chukchi-Beaufort Seas stock of bowhead whales, (2) the eastern North Pacific stock of gray whales, (3) minke and fin whale stocks off West Greenland, and (4) North Atlantic humpback whales off St. Vincent and The Grenadines.

Members of the Alaska Eskimo Whaling Commission are the primary hunters of bowhead whales, although a limited number of the available strikes have been allocated to Native hunters in Russia under a bilateral agreement between the United States and Russia. In 2006 Alaska Natives struck 39 bowhead whales and landed 31 whales, maintaining the nearly 80 percent hunting efficiency rate achieved over



Figure 23. Early photo of whalers reloading the lance harpoon. Courtesy of National Oceanic and Atmospheric Administration photo archives.

the past 10 years. Because of adverse ice and weather conditions, hunters in Russia took no bowhead whales in 2006.

At the 2004 IWC meeting, a question was raised regarding an important assumption in the algorithm being developed to establish strike limits for bowhead whales—the assumption that there is only a single stock of bowhead whales migrating past Barrow, Alaska, and available to subsistence hunters in Alaska and the Chukotka area of Russia. Preliminary information presented at the 2004 meeting suggested that this might not be the case. In response, the United States convened a workshop in 2005 to examine the stock structure of Bering-Chukchi-Beaufort Seas bowhead whales and to evaluate and establish priorities for the ongoing research program investigating stock structure. The IWC expects to hold a follow-up workshop early in 2007 in anticipation of a review of bowhead whale subsistence whaling at the 2007 IWC meeting. Pending that review, the IWC concluded at its 2006 meeting that the existing strike limit algorithm for bowhead whales remains the most appropriate tool for managing the harvest, and it saw no need to adjust the quota for 2006 or 2007.

Most of the hunting of gray whales is undertaken in Russia although 20 of the allowable

takes (i.e., up to 5 a year) have been apportioned by the United States to hunters from the Makah Tribe, which resides on the Olympic Peninsula in Washington. Although hunting by the Makah Tribe is reflected in the IWC gray whale quota, a 2004 ruling by the U.S. Ninth Circuit Court of Appeals has prevented the tribe from engaging in whaling unless and until it obtains authorization to take whales through a waiver of the taking moratorium under the Marine Mammal Protection Act. The tribe applied for such a waiver in February 2005 and throughout much of 2006 the National Marine Fisheries Service continued its evaluation of the application and has been preparing an environmental impact statement in anticipation of proposing regulations to authorize the requested take of gray whales.

Status of Whale Stocks

The IWC and its Scientific Committee routinely review the status of whale stocks. At the 2006 meeting, new information was received on Antarctic minke whales, North Pacific minke whales, Southern Hemisphere humpback whales, Southern Hemisphere blue whales, and a number of small stocks of bowhead, right, and gray whales. The Scientific Committee concluded that, although there is some evidence of increased abundance for stocks of humpback, blue, and right whales in the Southern Hemisphere, these stocks remain at reduced numbers compared to their pre-whaling status. Special attention was paid to the status of the western North Pacific stock of gray whales, which numbers about 122 animals. The Scientific Committee noted that the survival of this population remains in doubt due to threats from oil and gas operations off Sakhalin Island in Russia and entanglement in fishing gear. (See Chapter VI for more information concerning these stocks.)

IWC Conservation Committee

The IWC's Conservation Committee, established in 2004, met again in 2006. Although there continues to be disagreement within the IWC over the need for and terms of reference

of that committee, there is growing recognition that it is now an established entity. Countries that had supported the committee's creation pointed to its value in investigating the phenomenon of inedible "stinky" gray whales caught by aboriginal subsistence hunters on Russia's Chukotka Peninsula and in assembling information on and developing strategies to address the issue of whales being killed or seriously injured by ship strikes. Japan, which had opposed creation of the committee, thought that the scope of the committee's mission needed to be expanded to include the concept of sustainable use, which, it stressed, was not in conflict with whale conservation. Other countries thought that the committee did not have enough to do and suggested that it expand its activities to consider the establishment of sanctuaries, address environmental and health concerns, and review issues related to whale watching.

Other issues considered at the 2006 IWC meeting included proposed schedule amendments to accommodate small-type coastal whaling by Japan, create a South Atlantic whale sanctuary, and abolish the Southern Ocean whale sanctuary. As in past years, none of these proposals was adopted.

Related Actions

On 17 July 2006, 17 members of the U.S. Senate wrote to Secretary of State Condoleezza Rice and Secretary of Commerce Carlos Gutierrez, expressing appreciation for their agencies' leadership in seeking international measures to conserve whales and urging that the Administration take additional action in this regard. First, the senators asked that the Administration consider imposing trade sanctions under the Pelly Amendment to the Fishermen's Protective Act against countries that engage in commercial whaling or lethal research whaling and that have been certified under the Pelly Amendment for the taking of whales that diminishes the effectiveness of the International Convention for the Regulation of Whaling. The Secretary of Commerce first certified Japan for

its research whaling in 1988 and recertified that country in 1995 and 2000 for expansion of its research program. The Secretary certified Iceland in 2004 for its research whaling. Norway has also been certified multiple times, first for engaging in research whaling and most recently in 1993 for its resumption of commercial whaling. All of those certifications remain in place and could form the basis for the imposition of trade sanctions under the Pelly Amendment. Second, the senators called on the Administration to consider all available diplomatic, economic, and trade measures that might be taken to ensure that international protections for whales are not undermined.

Commerce Secretary Gutierrez replied to the senators by letter of 8 September 2006, expressing concern about the increasing whaling activities of Norway, Iceland, and Japan and confirming the Administration's opposition to research whaling as currently being practiced. A similar response was transmitted by the State Department on 15 September 2006. In addition, the State and Commerce Departments convened an interagency working group, which includes a representative of the Marine Mammal Commission, to consider possible sanctions under the Pelly Amendment or other measures that might be taken by the United States. The working group met initially in 2006 and is expected to complete its review in 2007.

Similarly, on 13 December 2006 the Whale and Dolphin Conservation Society, on behalf of itself and other whale conservation organizations, petitioned Secretary Gutierrez and Secretary of the Interior Dirk Kempthorne to certify Iceland under the Pelly Amendment for its resumption of commercial whaling and planned international trade in whale products. The Secretary of Commerce is responsible for determining whether a nation's whaling program diminishes the effectiveness of the International Convention for the Regulation of Whaling. The Secretary of the Interior is responsible for issuing certifications based on trade that diminishes the effectiveness of the

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Action on that petition was pending as of the end of 2006.

The 59th meeting of the IWC and its committees was to be held in Anchorage, Alaska, from 7 to 31 May 2007.

United States–Russia Polar Bear Agreement

Alaska is home to two stocks of polar bears: the western or Chukchi/Bering Seas stock, shared with Russia, and the southern Beaufort Sea stock, shared with Canada (Table 15). A number of additional stocks occur throughout the Arctic in Canada, Greenland, Norway, and Russia. Polar bears can traverse great distances, often crossing national boundaries and into international waters. As such, efforts to conserve polar bears often require international cooperation. Recognizing this, and because of concern over the increase in the number of polar bears being taken by hunters in the 1950s and 1960s, the United States, Canada, Denmark (for Greenland), Norway, and the Soviet Union negotiated the Agreement on the Conservation of Polar Bears. The agreement was concluded in 1973 and entered into force in 1976. Among other things, the agreement limits the purposes for which polar bears may be taken, prohibits certain methods of taking, and requires the parties to protect habitat components that are important to polar bears, such as denning and feeding sites and migratory corridors. It also requires signatory countries to maintain national research programs. Implementation of the agreement by the United States relies on domestic legislation, primarily the Marine Mammal Protection Act.

In the early 1990s the Marine Mammal Commission and others raised concerns that existing U.S. laws may not be sufficient for the United States to implement fully all provisions of the Agreement on the Conservation of Polar Bears, particularly with respect to habitat protection. Also, it was not clear that all of the

hunting restrictions contained in the agreement had been accounted for in the Marine Mammal Protection Act or other U.S. laws. For example, the provisions of the Marine Mammal Protection Act allow Alaska Natives to take marine mammals for subsistence and the creation and sale of handicrafts. However, those provisions do not restrict the taking of polar bear cubs or female bears with cubs or hunting in polar bear denning areas, as does a resolution adopted by the parties to the agreement.

In part to address these apparent deficiencies, the Fish and Wildlife Service began discussions with its Russian counterparts to develop a unified management approach for the polar bear population shared by the two countries. These discussions culminated in the two countries signing a protocol in 1992 expressing their intent to pursue a joint management agreement for the Chukchi/Bering Seas stock of polar bears. Further impetus for a bilateral polar bear treaty between the United States and Russia came from an amendment enacted to the Marine Mammal Protection Act in 1994. Section 113(d) of the Act, added at that time, called on the Secretary of the Interior, acting through

the Secretary of State and in consultation with the Marine Mammal Commission and the state of Alaska, to consult with Russian officials on the development and implementation of enhanced cooperative research and management programs for the shared polar bear stock.

In October 2000 efforts to pursue greater cooperation between the United States and Russia with respect to the Chukchi/Bering Seas polar bear stock culminated with the signing of the Agreement between the Government of the United States of America and the Government of the Russian Federation on the Conservation and Management of the Alaska-Chukotka Polar Bear Population. The agreement specifies that subsistence taking by Native residents of Alaska and Chukotka is to be the only allowable consumptive use of the affected stock of polar bears. Under the agreement, a joint commission composed of four members—a governmental official and a representative of its Native people from each jurisdiction—is to establish annual taking limits that may not exceed the sustainable harvest level determined for the stock. The allowable take will be divided equally between the two parties, but, subject to approval by the joint commission, either party may transfer a portion of its allowable take to the other party.



Figure 24. Polar bear mother and cub. Photograph by Mike Dunn, North Carolina State Museum of Natural Sciences, courtesy of the NOAA Photo Library.

Once in place, the joint commission will establish a scientific working group to assist in setting annual sustainable harvest levels and in identifying scientific research to be carried out by the parties.

Other provisions of the agreement prohibit the taking of denning bears, females with cubs, or cubs less than one year old, and the use of aircraft and large motorized vessels for hunting polar bears. Also, the agreement directs the parties to undertake all efforts necessary to conserve polar bear habitats, particularly denning areas and those areas where polar bears concentrate to feed or migrate. Implementation of these provisions is expected to help ensure that the United States is in full compliance with the provisions of the multilateral 1973 polar bear treaty. Additional information concerning the Chukchi/Bering Seas polar bear population and the treaty can be found at the Web site maintained by the Fish and Wildlife Service's Alaska Region (<http://alaska.fws.gov/fisheries/mmm/polarbear/pbmain.htm>).

Before the agreement can take effect, it must be ratified by the parties. Russia has already completed this process. In the United States, a key step in the ratification process is securing the advice and consent of the Senate. The Senate unanimously passed a resolution providing its advice and consent on 31 July 2003, subject to one condition. That condition requires the Secretary of State to provide prompt notification to the Senate Committee on Environment and Public Works and the Committee on Foreign Relations if, pursuant to Article 3 of the agreement, the parties modify the boundaries of the area covered by the agreement.

In addition, the United States recognized that legislation to implement certain provisions of the agreement domestically were needed. Toward this end, Senator Ted Stevens, on behalf of himself and Senator Daniel Inouye, introduced S. 2013, the United States–Russia Polar Bear Conservation and Management Act of 2005, on 15 November 2005. Among other things, that bill would have—

- created a new title under the Marine Mammal Protection Act specifically to address Alaska-Chukotka polar bears and implementation of the bilateral agreement;
- set forth the procedures by which U.S. commissioners are selected;

Table 15. Numbers of polar bears reported taken in Alaska Native harvests, 1980–2005

Harvest Year ¹	Total Taken	Chukchi/Bering Sea Stock	Beaufort Sea Stock
1980–1981	109	71	38
1981–1982	92	69	23
1982–1983	88	56	32
1983–1984	297	235	62
1984–1985	120	67	53
1985–1986	133	103	30
1986–1987	104	68	36
1987–1988	125	91	34
1988–1989	142	83	59
1989–1990	103	78	25
1990–1991	82	60	22
1991–1992	61	34	27
1992–1993	80	42	38
1993–1994	127	77	50
1994–1995	96	73	23
1995–1996	46	12	34
1996–1997	92	38	54
1997–1998	61	33	28
1998–1999	107	84	23
1999–2000	67	36	31
2000–2001	95	51	44
2001–2002	108	75	33
2002–2003	65	26	39
2003–2004	63	21	42
2004–2005	60	33	27
2005–2006	79	54	25

¹ Harvest year is 1 July to 30 June.
Data courtesy of the U.S. Fish and Wildlife Service.

- established prohibitions on taking polar bears in violation of the U.S.–Russia agreement or any annual limit or other restriction on the taking of polar bears adopted by the parties to that agreement;
- added separate enforcement and penalty provisions for violations of the bilateral agreement and the implementing legislation;
- delegated enforcement authority to the Alaska Nanuuq Commission;
- directed the Secretary of the Interior to promulgate regulations to implement the provisions of the Act and the agreement; and
- directed the Secretary of the Interior to consult with the Secretary of State, the Marine Mammal Commission, and the Alaska Nanuuq Commission on all matters involving implementation of the agreement.

The Senate Commerce Committee held a mark-up of S. 2013 on 17 November 2005. The Committee unanimously approved the bill, sending it forward to the full Senate for its consideration. The Senate passed S. 2013 by unanimous consent on 6 June 2006 and referred the bill to the House of Representatives for action.

Instead of taking up S. 2013 as an independent bill, the House incorporated many of its provisions into H.R. 4075, the Marine Mammal Protection Act reauthorization bill then under consideration. Among the changes from the Senate bill, the House version would have (1) relied on the general enforcement and penalty provisions of the Marine Mammal Protection Act, rather than creating new provisions specific to violations of the new title; (2) increased the authorization levels for carrying out the provisions of the new title; and (3) deleted the specific requirement that the Secretary of the Interior consult with the Marine Mammal Commission on implementation of the bilateral agreement. As discussed in Chapter III, the House of Representatives passed its version of H.R. 4075, including the polar bear provisions, on 17 July 2006.

The Senate, however, was not interested in taking up a comprehensive Marine Mammal Protection Act reauthorization bill in the final months of the 2006 session of Congress. Instead, it considered a version of H.R. 4075 that had been amended to include only the provisions related to implementation of the U.S.–Russia polar bear agreement. Reflecting this change, the legislation had been retitled the “United States–Russia Polar Bear Conservation and Management Act of 2006.” The Senate passed its version of H.R. 4075 on 6 December 2006, which included several modifications of the House-passed version. It clarified that violations would be limited to persons subject to the jurisdiction of the United States and those in waters or on lands under U.S. jurisdiction. The enforcement provisions were expanded to indicate more precisely how violations would be addressed. Among other things, the Senate bill specified that vessels, aircraft, and other means of transportation used in violation of the Act would be subject to forfeiture. The appointment provisions were revised to specify that one of the U.S. commissioners to be appointed by the President would be an official of the federal government and the other a representative of the Native people of Alaska for whom polar bears are an integral part of their culture. The Senate version also reverted to the funding levels that had been included in S. 2013.

The Senate bill expanded on the relationship between new Title V and the pre-existing provisions of the Marine Mammal Protection Act, clarifying that the other provisions of the Act would be inapplicable, except as specified in the new title (e.g., the enforcement and penalty provisions would remain applicable). As a result of this clarification, the taking of polar bears under the U.S.–Russia agreement would no longer be subject to the more general provisions of the Act pertaining to taking for subsistence purposes. Although the bill was not amended to reinsert an explicit consultative role for the Marine Mammal Commission, a provision was added to specify that Title II of

the Act, pertaining to the Commission, would remain applicable. Under Title II, the Commission is directed to consult with the Secretary as either party deems necessary or desirable, and it has specific responsibilities to review activities of the United States pursuant to international agreements relating to marine mammals and to make recommendations to the Secretary concerning actions needed to further the policies of the Act.

To overcome scheduling difficulties at the end of the 2006 session of Congress, the Senate version of H.R. 4075 was wrapped into another bill that had been placed on the legislative docket, the Magnuson–Stevens Fishery Conservation and Management Reauthorization Act of 2006. That bill, including the polar bear amendments to the Marine Mammal Protection Act, was passed by Congress on 8 December 2006 and was expected to be signed by President Bush early in 2007. At the end of 2006, the ratification process was ongoing. It is expected that the United States will ratify the agreement and appoint its commissioners during 2007.

Convention on International Trade in Endangered Species of Wild Fauna and Flora

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is the primary international framework for ensuring that international trade in animals and plants is not detrimental to their survival. The Convention entered into force in 1975. Currently 170 countries have signed and ratified the agreement, with the most recent signatory nations being Serbia and Montenegro. Member countries hold a Conference of the Parties approximately every other year, the last one being in 2004. The Fish and Wildlife Service is the lead agency for implementing the Convention in the United States, although it coordinates closely with the National Marine Fisheries Service on species under that agency's jurisdiction.

Under CITES, species are classified into three appendixes depending on their conservation status, and trade in them is regulated accordingly. 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. Appendix II also may include species if they or their products in trade 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 that party needs the cooperation of other parties to control trade. Additions and deletions of species listed on Appendixes I and II require concurrence by two-thirds of the parties voting on a listing proposal. Any party within the range of a species may place that species on Appendix III unilaterally. Member countries may propose adding or deleting species from the appendixes or transferring species from one appendix to another before any of the biennial meetings.

CITES Animals Committee and Actions Related to Marine Mammals

The annual meeting of CITES' Animals Committee was held in Lima, Peru on 7–13 July 2006. At its 2004 meeting, the Canada and Greenland populations of narwhals (*Monodon monoceros*) were nominated for review. In 2006 the Animals Committee considered a joint report of the North Atlantic Marine Mammal Commission and the Canada/Greenland Joint Commission on Conservation and Management of Narwhal and Beluga. The committee also considered a 14 June 2006 letter from the Danish Management Authority, written on behalf of Greenland. In that letter, the Danish Management Authority noted that it had instituted an export ban on narwhal specimens, which would remain in force unless or until an appropriate

non-detriment finding could be made. Canada explained that international trade was not the driving force behind its harvest of narwhals and indicated that current controls ensured a sustainable harvest. In 2006 the Animals Committee established a working group to review significant trade issues but, based on measures already taken by Canada and Denmark (on behalf of Greenland), agreed to exclude narwhals from Canada and Greenland from the review. The committee may reconsider these populations at a later time, should trade in narwhals from the waters of these countries resume.

Actions Taken in Preparation for the 2007 Meeting

The 14th Conference of the Parties to CITES will occur 3 to 15 June 2007 in The Hague, The Netherlands. At the past four meetings of the Parties, Japan submitted proposals to downlist several species of large whales from Appendix I to Appendix II. Currently all species of large whales managed by the International Whaling Commission (IWC) are listed in Appendix I, except for the West Greenland population of minke whales (*Balaenoptera acutorostrata*), which is listed on Appendix II. Taking a somewhat different tack, Japan proposed in 2006 that the Animals Committee review the basis for the listing status of all cetacean species managed by the IWC. Japan believes that, based on current population estimates, most whale stocks should not be regarded as threatened with extinction and therefore do not meet the biological criteria for inclusion in Appendix I. Downlisting the stocks, Japan argues, would demonstrate that CITES bases its decisions solely on scientific and objective information, rather than on political reasons. In effect, the Japanese proposal would open the door for the resumption of international commercial trade in whale products, although individual downlistings of the affected stocks would still need to be adopted by the CITES Parties. Although Japan has whale meat available for consumption as a result of its scientific whaling programs, it has

expressed interest in resuming trade in whale meat with Norway and Iceland, which also take whales in commercial and/or scientific whaling operations. The United States continues to oppose proposals to downlist whale species to maintain consistency with the conservation measures agreed to by the IWC, including a moratorium on commercial whaling.

Previous proposals to downlist whales have been rejected, with many parties agreeing with the United States that CITES should not remove these species from Appendix I before the IWC completes a Revised Management Scheme to regulate whaling and lifts the commercial whaling moratorium. Further information regarding ongoing whaling programs and efforts to complete the Revised Management Scheme is provided in the previous section of this chapter. No other proposals directed at changing the listing of marine mammals have been made for consideration at the 2007 CITES Conference of the Parties.

The Relationship between CITES and the IWC

In recent years parties to CITES have debated the relationship between CITES and other international conventions and organizations such as the IWC and the United Nations Food and Agricultural Organization. In 1982, after the IWC adopted a moratorium on the commercial take of large whales, it requested that the CITES Parties assist the IWC by including in CITES Appendix I those whale species subject to the moratorium. Many CITES parties, including the United States, supported the IWC request and continue to oppose any proposals to revise appendix designations for whales before the IWC has lifted the moratorium. Whaling nations and their supporters believe that work to complete the Revised Management Scheme is proceeding too slowly and that CITES should act independently, and in accordance with the Convention's own criteria for listing species in the appendixes, rather than taking into consideration the views or actions of the IWC. The

issue has garnered attention because Iceland has resumed both scientific and commercial whaling, and Norway, earlier this decade, initiated the first international trade in whale

products in more than 10 years by shipping to Iceland minke whale products. The relationship between CITES and the IWC is an issue that remains alive in both forums.

Chapter IX

PERMITS AND AUTHORIZATIONS TO TAKE MARINE MAMMALS

The Marine Mammal Protection Act places a moratorium, subject to certain exceptions, on the taking and importing of marine mammals and marine mammal products. The Act defines taking to mean to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal. One such exception provides for the issuance of permits by either the National Marine Fisheries Service or the Fish and Wildlife Service, depending on the species of marine mammal involved, for the taking or importation of marine mammals for purposes of scientific research, public display, or enhancing the survival or recovery of a species or stock. Permits are also available for the taking of marine mammals in the course of educational or commercial photography and for importing polar bear trophies from certain populations in Canada. With the exception of those for the importation of polar bear trophies, the Marine Mammal Commission is required to review all permit applications.

Another of the Act's exceptions provides for the granting of authorizations by the National Marine Fisheries Service and the Fish and Wildlife Service for the taking of small numbers of marine mammals incidental to activities other than commercial fishing, provided that the taking will have only a negligible impact on the affected stocks. Small-take authorizations incidental to a number of such activities are discussed later in this chapter.

This chapter discusses the Commission's review of permit applications and authorization requests that it received in 2006. The chapter also provides information on the importation of polar bear trophies and the public's interactions with marine mammals in the wild.

Review of Permit Applications

Permits for scientific research, public display, species enhancement, and photography all involve the same four-step review process: (1) either the National Marine Fisheries Service or the Fish and Wildlife Service receives and initially reviews applications from individuals or organizations; (2) the Service publishes a notice of receipt of the application in the *Federal Register*, inviting public review and comment, and transmits the application to the Marine Mammal Commission; (3) the Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, reviews and

transmits its recommendation to the Service; and (4) the Service takes final action after consideration of comments and recommendations from the Commission and the public. If captive maintenance of animals is involved, the Service seeks the views of the Department of Agriculture's Animal and Plant Health Inspection Service on the adequacy of facilities, animal husbandry and care programs, and transportation arrangements.

Once a permit is issued, the responsible agency can amend it, provided the proposed change meets the applicable statutory and regulatory requirements. Depending on the extent of the proposed change, an amendment may be

subject to the same notice, review, and comment procedures as the original permit application. The Commission reviews amendments to permits, except those amendments considered under the National Marine Fisheries Service's permit regulations to be of a minor nature (i.e., those that do not extend the duration of the research beyond 12 months, result in the taking of additional numbers or species of animals, increase the level of take or risk of adverse impact, or change or expand the location of the research).

During 2006 the Commission reviewed 20 permit applications submitted to the National Marine Fisheries Service and 9 permit applications submitted to the Fish and Wildlife Service. Of the applications forwarded to the Commission from the National Marine Fisheries Service, 17 were for scientific research, one was for commercial/educational photography, and two were for public display. Of the applications received from the Fish and Wildlife Service, four were for scientific research and five were for public display. In addition, the Commission reviewed seven permit amendment requests submitted to the Services (five to the National Marine Fisheries Service and two to the Fish and Wildlife Service). In general, the Services adopted the Commission's recommendations concerning these permit actions. For additional information, see Appendix A of this report.

Letters of Confirmation under the General Authorization

In 1994 Congress amended the Marine Mammal Protection Act to, among other things, establish a general authorization procedure that would facilitate the process of obtaining a scientific research permit for certain types of activities. The amendment requires that the National Marine Fisheries Service and the Fish and Wildlife Service use this general authorization for marine mammal research that involves the taking by Level B harassment only (i.e., any

act of pursuit, torment, or annoyance that has the potential to disturb but not injure a marine mammal or marine mammal stock). Under the general authorization procedure, the Services may issue letters to researchers confirming that their activities may appropriately be conducted. During 2006, 12 letters of confirmation were issued under the general authorization by the National Marine Fisheries Service.

Currently, general authorizations do not apply to activities that may take endangered or threatened marine mammals. In its testimony before the House Resources Committee's Subcommittee on Fisheries Conservation, Wildlife, and Oceans in June 1999, the Commission recommended that the Marine Mammal Protection Act be amended to expand the general authorization to apply to all such marine mammals. However, such a proposal has not been included in the draft reauthorization bills submitted to Congress by the Secretary of Commerce and the Secretary of the Interior. The reasoning was that an amendment to the Endangered Species Act would be a more appropriate vehicle for implementing such a change. However, as noted elsewhere in this report, at the end of 2006, Congress had not yet reauthorized either the Marine Mammal Protection Act or the Endangered Species Act.

Polar Bear Trophy Imports

Amendments to the Marine Mammal Protection Act enacted in 1994 allow the Secretary of the Interior to issue permits authorizing the importation of polar bear trophies from sport hunts conducted in Canada, provided that certain findings are made. Among other things, the Secretary must find that Canada has a monitored and enforced sport-hunting program that is (1) consistent with the purposes of the Agreement on the Conservation of Polar Bears and the Marine Mammal Protection Act and (2) based on scientifically sound quotas that will ensure the maintenance of the affected population stock at a sustainable level. Currently, imports of trophies are approved

from seven of 13 management units identified by Canada. Imports from the other management units are not allowed, pending receipt of additional information sufficient to make the findings required under the Marine Mammal Protection Act.

In 2005 the Commission became aware of proposals to substantially increase the allowable harvest of polar bears from certain management units within the Canadian territory of Nunavut. As discussed in the previous annual report, the Commission wrote to the Fish and Wildlife Service in February 2005 noting the need for additional information on the scientific basis for the proposed increases. At the end of 2006 the Fish and Wildlife Service was continuing to consult with Canada and to review information on changes to Nunavut's polar bear program and the implication of those changes and recent abundance estimates for authorizing trophy imports under the Marine Mammal Protection Act. If warranted based on that review, the Service is expected to publish a proposed rule in 2007 to revise the list of approved management units.

Although the Commission comments to the Service as to whether a polar bear management unit meets the criteria to qualify for importation, it does not comment on individual permit requests to import trophies. Since regulations authorizing the importation of polar bear trophies from Canada were published in 1997, more than 800 import permits have been issued. Of these, 132 were issued in 1997, 60 in 1998, 142 in 1999, 76 in 2000, 70 in 2001, 52 in 2002, 68 in 2003, 108 in 2004, 61 in 2005, and 71 in 2006

Review of the Permit Process

In mid-2006 the National Marine Fisheries Service's Office of Protected Resources established an in-house team to conduct a review of its permit system with respect to the length of time and the type and quantity of information required for permit application reviews. As part

of the review, the Service is seeking to clarify and reconfirm the appropriate purposes, criteria, and mechanisms that should be part of the process to evaluate and issue scientific research permits. Given the special role that the Marine Mammal Commission plays in the permit application review process for marine mammals, the Service has requested input from the Commission on these topics.

Members of the Service's permit review team met informally with representatives from the Commission to discuss this topic on 24 May 2006. Major agenda items included clarification of the objectives of the Service's scientific review process as set out under relevant statutes, clarification of the definitions and criteria needed to achieve the objectives of the scientific review process, and identification of the administrative and procedural elements of an ideal and efficiently working permit process. The permit review was ongoing at year's end. To address some of the shortcomings of the current permit process, Commission staff informally sent to permit office staff a number of suggestions for improving the permit application, including changes to application instructions and requirements. In addition, the Commission identified a number of areas where the permit process might be modified. Those suggestions focused primarily on associated requirements of the National Environmental Policy Act and the Endangered Species Act. In particular, Commission staff suggested that those associated reviews be combined into a single analysis that would meet the requirements of both statutes. Commission staff also suggested that permit office staff reconsider the use of categorical exclusions under the National Environmental Policy Act and use more programmatic analyses under both the National Environmental Policy Act and the Endangered Species Act. At the end of 2006 the permit office was considering these and other possible mechanisms to improve the permit process.

Interactions with Marine Mammals in the Wild

Under the Marine Mammal Protection Act, any type of taking of marine mammals, including harassment, is prohibited unless specifically authorized. As discussed elsewhere in this chapter, permits and small-take authorizations can be issued to authorize taking for a variety of purposes, including but not limited to scientific research, public display, and photography. However, the Marine Mammal Protection Act provides for members of the public to take marine mammals during viewing or a recreational activity only if they obtain a waiver of the Act's taking moratorium. Such waivers are rarely sought.

As discussed in the Commission's previous annual reports, public interactions with marine mammals in the wild—which typically involve close approaches to observe, photograph, pose with, touch, swim with, or otherwise interact with the animals—has been an ongoing issue over the past several years. Although generally not motivated by a desire to harm the animals, such interactions can pose substantial risks to both the humans and the wild marine mammals involved. Risks to people include injury or death from drowning or being bitten, rammed, or otherwise attacked. Animals may be affected if they are driven from preferred habitat; injured by people trying to touch or prod them; debilitated by inappropriate, contaminated, or spoiled food; or have their behavior changed in ways that encourage them to interact with humans and become pests. In the late 1990s the Service initiated a nationwide public education and outreach campaign to encourage proper viewing of wildlife from a distance, and, over the years, the National Marine Fisheries Service's regional offices have developed guidelines for responsibly viewing marine mammals in the wild. Despite the Service's efforts, human interactions continue to increase, and evidence is growing that such activities may be adversely affecting the animals' welfare. Because human

interactions have the potential to disturb or injure wild marine mammals, in many instances they constitute harassment under the Marine Mammal Protection Act.

The Commission has written to the National Marine Fisheries Service several times in the past decade recommending that the Service advise both the public and commercial operators offering in-water experiences with dolphins off the coasts of Florida and Hawaii that interactions with the animals have the potential to disrupt the animals' behavioral patterns and constitute harassment under the Marine Mammal Protection Act.

Human Interactions with Spinner Dolphins in Hawaii

At its annual meeting in 2002 the Commission was briefed by National Marine Fisheries Service representatives about interaction problems involving the public and spinner dolphins in Hawaii. Among other things, agency representatives noted that the Office of the General Counsel of the National Oceanic and Atmospheric Administration (NOAA) and the Service's Southwest Regional Office do not consider public harassment of marine mammals to be a priority issue, are choosing not to enforce—or to selectively enforce—the harassment provisions of the Marine Mammal Protection Act, and are declining to prosecute harassment cases until “Congress tells them to make it a priority.”

On 6 May 2003 the Commission sent a letter to the Under Secretary for Oceans and Atmosphere of the Department of Commerce expressing its concern about increasing harassment of spinner dolphins related to swim-with-the-dolphin activities in Hawaii. The Commission also noted that human interactions are continuing with bottlenose dolphins in the southeastern United States and with various pinniped species along the California coast. The Commission expressed concern that, despite the frequency and predictability of these encounters, the agency has taken little or no

enforcement action to address these ongoing violations of the Act.

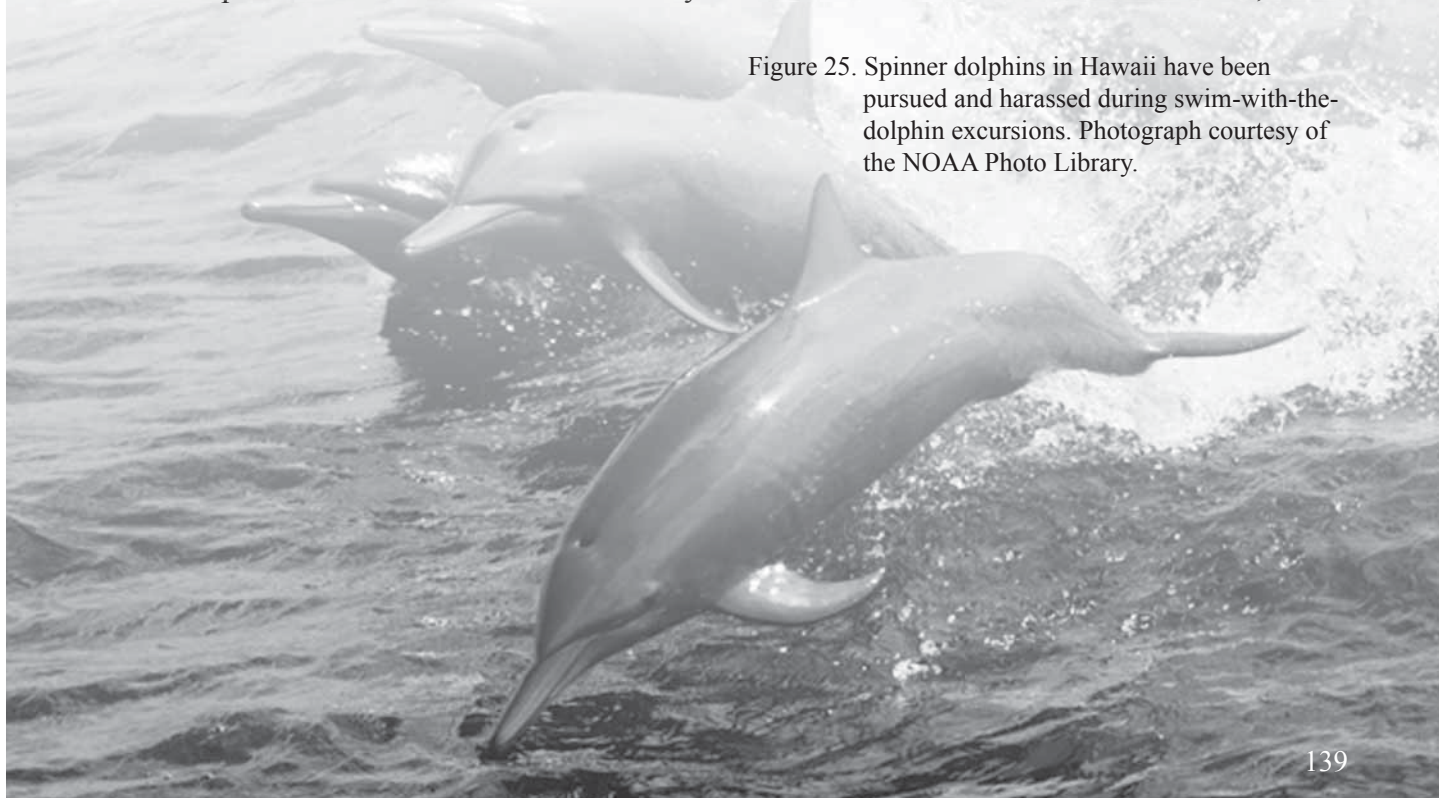
The agency responded on 6 January 2004 stating that, although NOAA's Office for Law Enforcement and the Office of the General Counsel are prepared to investigate and prosecute unlawful harassment, various factors (e.g., available personnel and budget resources, established priorities, the requirements of the Marine Mammal Protection Act, and the challenges these requirements pose to pursuing successful prosecutions) influence the agency's abilities to do so. The Service also stated that the agency is in the process of promulgating regulations that more specifically address human interactions with marine mammals in the wild.

As part of the harassment discussion at the Commission's 2004 annual meeting in Hawaii, the Commission, its Committee of Scientific Advisors, and invited guests visited one of the areas north of Kailua-Kona frequented by spinner dolphins and targeted by tour operators. The purpose of the visit was to get a firsthand understanding of the types of interactions that are occurring. Subsequently, many people who had been present on the field visit said that they

had observed activities that they considered intentional pursuit and harassment of dolphins. National Marine Fisheries Service representatives noted, however, that opinions differ as to what constitutes harassment, the Service's Office for Law Enforcement and NOAA's Office of the General Counsel are impeded in their ability to pursue enforcement by the ambiguity in the Marine Mammal Protection Act's definition of harassment, and proceeding with a rulemaking to clear up the uncertainties is premature in light of proposed legislation to amend the Act's definition of that term. Contrary to the Commission's previous understanding and the Service's earlier statements, agency representatives stated that the Service has no formal national policy concerning harassment that provides explicit guidance to the public concerning what activities the Service considers to have the potential for disturbing marine mammals.

Given this information, the Commission and meeting participants considered possible alternative solutions, in addition to considering stepped-up enforcement as a means of addressing the problems created by human-dolphin interactions in Hawaii. Toward that end, it was

Figure 25. Spinner dolphins in Hawaii have been pursued and harassed during swim-with-the-dolphin excursions. Photograph courtesy of the NOAA Photo Library.



suggested that the Service convene a meeting of federal, state, and local government agencies, researchers, tour operators, and other stakeholders to develop a comprehensive approach to the problem that looks at when, where, and how such activities can be conducted without adversely affecting the dolphins.

On 25 January 2005 the Commission sent a letter to the Under Secretary for Oceans and Atmosphere of the Department of Commerce recommending that cases be brought for at least the most egregious instances of harassment of spinner dolphins in Hawaii, which unambiguously fall within the Marine Mammal Protection Act's definition of harassment. The Commission also noted that it is incumbent on NOAA to act to resolve any perceived ambiguities in the definition of harassment that are impeding the ability of the National Marine Fisheries Service's Office for Law Enforcement to pursue cases. The Commission urged NOAA and the Service to consider various mitigation strategies short of rulemaking, including publication of a policy statement that provides explicit guidance and public notice of what the Service considers pursuit or annoyance of marine mammals and that identifies those activities that have the potential to disturb marine mammals.

The Service's response of 21 April 2005 provided a general overview of its efforts regarding conservation of marine mammals in Hawaii and noted that additional resources for the Western Pacific area are requested in the President's fiscal year 2006 budget. The Service did not address the Commission's specific concerns and recommendations with respect to human-dolphin interactions in Hawaii.

On 12 December 2005 the National Marine Fisheries Service published an advance notice of proposed rulemaking indicating that it was considering promulgating regulations specific to the main Hawaiian Islands to protect spinner dolphins from human interactions. The Service requested comments from the public regarding whether protective regulations were needed

and, if so, how they should be structured (e.g., whether they should establish a minimum approach limit for vessels and swimmers; prohibit activities of particular concern, such as swimming with or touching a spinner dolphin in the wild; restrict certain vessel practices, such as herding dolphins or positioning a vessel in the path of approaching dolphins; or establish time or area closures in or around biologically important areas).

The Commission commented on the Service's advance notice of proposed rulemaking by letter of 13 January 2006. The Commission expressed its view that the proposed rulemaking is a first step in developing the type of comprehensive solution to the swim-with-the-dolphin problem envisioned in the Commission's previous letters to the Service. The Commission recommended that, as part of the rulemaking being considered, the Service take steps to clarify what activities do and do not constitute harassment. The Commission recommended that the Service promptly move forward with a proposed rule that (1) closes certain areas (e.g., those areas identified as the most important resting areas) to all human activities, either during specified hours or when dolphins are present; (2) allows access to other areas used by dolphins subject to certain operating conditions (which might include speed limits, limits on the number of vessels, etc.); (3) establishes generally applicable rules for all other areas, specifying minimum approach distances (e.g., no approaches closer than 50 yards) and other limitations (e.g., no touching animals, no pursuing animals, etc.); and (4) provides the maximum possible clarity for enforcement purposes.

On 2 October 2006 the National Marine Fisheries Service published a notice in the *Federal Register* announcing its intent to prepare an environmental impact statement to assess the potential impacts on the human environment that could result from regulations being considered to protect wild spinner dolphins in Hawaii. The impact statement would promote informed selection of a preferred alternative

to mitigate impacts people are having on the dolphins.

The Commission provided comments on the notice to the Service by letter of 24 November 2006. The Commission recommended that in drafting the environmental impact statement the Service develop a preferred alternative that includes time/area closures, restrictions on operating conditions (e.g., speed limits), and codification of the Service's existing guidelines for viewing spinner dolphins. The Commission also recommended that the draft environmental impact statement focus not only on the taking prohibition of the Marine Mammal Protection Act as the statutory basis for possible regulations to protect spinner dolphins but also discuss the independent authority under section 2(2) and section 112(a) of the Act as an additional basis for regulations designed to protect essential habitats, such as spinner dolphin resting areas. The Commission understands that the Service is currently in the process of drafting the environmental impact statement. The draft is expected to be available for public review sometime in the winter of 2007.

Small-Take Authorizations

As noted earlier, section 101(a)(5) of the Marine Mammal Protection Act allows U.S. citizens to obtain authorization to unintentionally take small numbers of marine mammals incidental to activities other than commercial fishing when they meet certain conditions. Applicants can use this provision when the number of animals likely to be affected is considered to be small and the impacts on the size and productivity of the affected species or populations are likely to be negligible. This provision applies to the incidental taking of both depleted and non-depleted species and populations. All

forms of incidental taking, including lethal taking, may be authorized by regulation under section 101(a)(5)(A). Subparagraph, section 101(a)(5)(D), added to the Act in 1994, provides a streamlined alternative to securing a small-take authorization when the taking will be by harassment only.

Authorizations under section 101(a)(5)(A) require that the regulations be promulgated setting forth permissible methods of taking and requirements for monitoring and reporting, as well as a finding that the incidental taking will have negligible effects on the size and productivity of the affected species or stocks. Authorization for incidental harassment under section 101(a)(5)(D) does not require that regulations be promulgated. Rather, within 45 days of receiving an application that makes the required showings, the Secretary is to publish a proposed authorization and notice of availability of the application for public review and comment in the *Federal Register* and in newspapers and by appropriate electronic media in communities in the area where the taking would occur. After a 30-day comment period, the Secretary has 45 days to make a final determination on the application. The Secretary may issue authorizations under section 101(a)(5)(A) for a period of up to five years. The Secretary may issue authorizations under section 101(a)(5)(D) for a period of up to one year. Both types of authorizations may be renewed.

During 2006 the Commission reviewed 27 requests for small-take authorizations, 4 under section 101(a)(5)(A) and 23 under section 101(a)(5)(D). The proposed activities are listed in Table 16. The Commission's recommendations and the agencies' responses to the recommendations are summarized in Appendix A.

Table 16. Small-Take Authorization Requests Reviewed by the Commission in 2006

Applicant	Requested Activity	Commission Response
<i>Authorizations under Section 101(a)(5)(A)</i>		
Alaska Oil and Gas Association	To take small numbers of polar bears and Pacific walrus incidental to year-round oil and gas operations in the Beaufort Sea and adjacent northern coast of Alaska	Letter of 27 April 2006 to the Fish and Wildlife Service
Minerals Management Service	To take up to 28 species of cetaceans incidental to the removal of oil and gas drilling and production structures in the Gulf of Mexico	Letter of 22 May 2006 to the National Marine Fisheries Service
Knik Arm Bridge and Toll Authority	To take small numbers of beluga whales, harbor seals, Steller sea lions, harbor porpoises, and killer whales incidental to construction of the Knik Arm Bridge in Alaska over five years	Letter of 22 September 2006 to the National Marine Fisheries Service
U.S. Navy	To take marine mammals incidental to operation of the U.S. Navy's Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) sonar in geographic locations to be specified by the applicant	Letter of 30 October 2006 to the National Marine Fisheries Service
<i>Authorizations under Section 101(a)(5)(D)</i>		
Eglin Air Force Base	To take small numbers of marine mammals incidental to conducting air-to-surface gunnery missions in the Gulf of Mexico	Letter of 24 February 2006 to the National Marine Fisheries Service
California Department of Transportation	To take small numbers of marine mammals incidental to construction of a replacement bridge for the east span of the San Francisco-Oakland Bay Bridge	Letter of 3 March 2006 to the National Marine Fisheries Service
ASRC Energy Services, Lynx Enterprises, Inc.	To take small numbers of marine mammals by harassment incidental to on-ice vibroseis seismic operations in the Harrison Bay portion of the western U.S. Beaufort Sea	Letter of 29 March 2006 to the National Marine Fisheries Service
U.S. Navy	To take small numbers of marine mammals by harassment incidental to conducting Rim of the Pacific (RIMPAC) antisubmarine warfare training exercises in waters around the Hawaiian Islands	Letter of 24 May 2006 to the National Marine Fisheries Service
Shell Offshore, Inc. and Western-Geco, Inc.; Conoco Phillips Alaska, Inc.; and GX Technology	To take small numbers of marine mammals by harassment incidental to conducting seismic surveys during the open-water season in the Chukchi Sea	Letter of 5 June 2006 to the National Marine Fisheries Service
Shell Offshore, Inc. and Western-Geco, Inc.; Conoco Phillips Alaska, Inc.; and GX Technology	To take small numbers of marine mammals by harassment incidental to conducting seismic surveys during the open-water season in the Chukchi Sea	Letter of 7 June 2006 to the U.S. Fish and Wildlife Service
University of Texas at Austin Institute for Geophysics	To take small numbers of marine mammals by harassment incidental to conducting a marine seismic survey in the Arctic Ocean	Letter of 16 June 2006 to the National Marine Fisheries Service

FEX L.P.	To take small numbers of marine mammals incidental to activities related to towing barges from West Dock Causeway in Prudhoe Bay, Alaska, to Cape Simpson or Point Lonely in the U.S. Beaufort Sea	Letter of 13 July 2006 to the National Marine Fisheries Service
URS Corporation	To take small numbers of marine mammals incidental to conducting geophysical surveys in the southern San Francisco Bay, California	Letter of 20 July 2006 to the National Marine Fisheries Service
U.S. Air Force	To take by harassment small numbers of Atlantic bottlenose dolphins and Atlantic spotted dolphins incidental to explosive testing of obstacle and mine clearance systems off Santa Rosa Island in the Gulf of Mexico	Letter of 24 July 2006 to the National Marine Fisheries Service
University of Texas at Austin Institute for Geophysics	To take by harassment small numbers of walrus and polar bears incidental to conducting a marine seismic survey in the Arctic Ocean, including the Chukchi Sea	Letter of 24 July 2006 to the U.S. Fish and Wildlife Service
Army Corps of Engineers, Jacksonville District	To modify its authorization to take small numbers of bottlenose dolphins incidental to expanding and deepening the Port Sutton Navigation Channel in Tampa Harbor, Florida	Letter of 3 August 2006 to the National Marine Fisheries Service
Eglin Air Force Base	To take small numbers of marine mammals incidental to Naval Explosive Ordnance Disposal School training operations in the northern Gulf of Mexico	Letter of 21 August 2006 to the National Marine Fisheries Service
Eglin Air Force Base	To take small numbers of several species of cetaceans in the Gulf of Mexico incidental to (1) precision strike weapons testing and training, and (2) Naval Explosive Ordnance Disposal School training operations	Letter of 31 August 2006 to the National Marine Fisheries Service
Moss Landing Harbor District	To take small numbers of Pacific harbor seals and California sea lions incidental to redevelopment of the Moss Landing Harbor, Monterey County, California	Letter of 10 October 2006 to the National Marine Fisheries Service
Scripps Institution of Oceanography	To take small numbers of marine mammals by harassment incidental to conducting a marine seismic survey in the South Pacific Ocean	Letter of 30 October to the National Marine Fisheries Service
Lamont-Doherty Earth Observatory	To take small numbers of marine mammals by harassment incidental to conducting an acoustic calibration and seismic testing program in the northern Gulf of Mexico	Letter of 7 November to the National Marine Fisheries Service
Bay Marina Management, Inc.	To take small numbers of marine mammals by harassment incidental to maintenance dredging in the area of the Pier 39 Marina, San Francisco, California	Letter of 13 November 2006 to the National Marine Fisheries Service
Glenn R. VanBlaricom, Ph.D.	To take small numbers of California sea lions, Pacific harbor seals, and northern elephant seals by harassment incidental to research activities to assess the trends in black abalone populations at San Nicolas Island, California	Letter of 17 November to the National Marine Fisheries Service

Chapter X

MARINE MAMMAL HEALTH AND STRANDING RESPONSE

Growing concern about stranded marine mammals, heightened by the large number of bottlenose dolphins that stranded along the U.S. Atlantic coast in 1987 and 1988, led the National Marine Fisheries Service to establish the Marine Mammal Health and Stranding Response Program. Amendments to the Marine Mammal Protection Act adopted in 1992 formalized the program and designated the National Marine Fisheries Service as the lead agency to coordinate related activities. The program's goals are to facilitate collection and dissemination of data; assess health trends in marine mammals; correlate marine mammal health with available data on physical, chemical, environmental, and biological parameters; and coordinate effective responses to unusual mortality events.

Unusual Mortality Events

The Marine Mammal Health and Stranding Response Act directed the Secretary of Commerce to—

- establish an expert working group to provide advice on measures necessary to better detect and respond appropriately to future marine mammal unusual mortality events;
- develop a contingency plan for guiding responses to such events;
- establish a fund to compensate people for certain costs incurred in responding to such events;
- develop objective criteria for determining when sick or injured marine mammals have recovered and can be returned to the wild;
- continue development of the National Marine Mammal Tissue Bank; and
- establish and maintain a central database for tracking and accessing data concerning marine mammal strandings.

The National Marine Fisheries Service, in consultation with the Marine Mammal Commission and the Fish and Wildlife Service, established the Working Group on Marine

Mammal Unusual Mortality Events in 1993. The group is composed of marine mammal experts from around the country. The fisheries service consults the working group whenever increases in stranding rates or other factors suggest that an unusual mortality event may be occurring.

Review of Responses to Unusual Mortality Events

At its 2004 annual meeting, the Working Group on Marine Mammal Unusual Mortality Events recommended a review to assess patterns in unusual mortality events and evaluate progress made in responding to such events since its inception. The review was completed and published in 2006 as a National Marine Fisheries Service Technical Memorandum (NMFS-OPR-35). The primary findings were as follows.

Between 1978 and early 2006 when the report was submitted, 57 mortality events had been detected by the stranding network, of which 29 were declared to be unusual. Although significant effort and financial resources were committed to investigating them, the

causes of about half of those events, including those deemed unusual and those not, remain unknown. Prior to establishing the response program, the causes of 10 of 11 (91 percent) mortality events were determined and reported. Since establishment of the program, the causes of 26 of 46 (56 percent) mortality events and 14 of 29 (48 percent) events declared unusual have been determined. Those results suggest that establishing the unusual mortality event process has not enhanced the identification of causes of mortality events. However, prior to the establishment of the working group, documentation of mortality events may have been more likely when the cause was known. Thus, marine mammal mortality events of unknown etiology between 1978 and 1991 may not have been recorded in the literature. Conversely, the development of new assessment methods in recent years may have increased the probability that events would be successfully diagnosed.

Causes of mortality events have included biotoxins, viruses, bacteria, parasites, human interactions, oil spills, and changes in oceanographic conditions. Prior to 1996, the year of a large manatee mortality caused by brevetoxin (red tide), only five of 24 (20 percent) reported marine mammal mortality events were associated with exposure to biotoxins. Since then, 12 of 31 (39 percent) mortality events have been associated with exposure to biotoxins, and events caused by domoic acid and brevetoxin appear to be increasing in frequency. Influenza virus caused two mortality events in 1979 and 1982, but in more recent years, morbillivirus epidemics have been the more common cause of mortality events associated with or attributed to viruses. Some mortality events have become regular in their frequency, and the decision as to whether to classify these as “unusual” has varied among years. The factors predisposing marine mammals to mortality events and the population impacts of such events are generally unclear.

The report also included the following recommendations for improving the effectiveness of responses to marine mammal mortality events:

- Expand the national stranding database to include data on causes of death and disease investigations; integrate single stranding, mass stranding, and unusual mortality event data into one up-to-date searchable database; and develop data-sharing protocols to facilitate collaborations and extensions of analyses;
- Improve the stranding network’s surveillance capabilities by providing dedicated and consistent funding sources (e.g., the Prescott grant program) to network members to ensure a consistent level of response; holding regular training workshops for network members; directing training and funding to areas of the network with poor coverage of the coastline; stocking each region with supplies for emergency sampling of marine mammals; posting response, sampling, and shipping protocols to a Web site for easy access; and identifying funds for carcass handling and disposal so that large whales can be towed ashore for examination and disposal;
- Improve the administrative process for managing mortality event investigations by maintaining a full-time response coordinator;
- Establish emergency response teams of trained personnel capable and available to respond to unusual mortality events;
- Require timely submission of final reports and encourage publication of those reports in the peer-reviewed literature;
- Develop a centralized national sample archiving system to include fluids and tissues from animals during events;
- Improve the availability and quality of diagnostic tests performed on samples from marine mammals by identifying and funding dedicated laboratories for pathology,

- infectious diseases, biotoxin, and contaminant analyses; developing a quality assurance program for laboratories that analyze marine mammal samples; and establishing sample-collection protocols to ensure suitable collection of samples;
- Integrate the Marine Mammal Health and Stranding Response Program with stock assessment and population monitoring programs, as well as with other federal programs addressing environmental and climate parameters impacting marine mammal health to determine the effect of disease and changes in health on host populations; and
 - Develop and fund a research plan to investigate factors predisposing populations to mortality events.

Revised Criteria for Identifying an Unusual Mortality Event

On 14 December 2006 the working group announced revised criteria for evaluating morbidity, mortality, and stranding events to determine whether they merit declaration as unusual. Formally declared unusual mortality events qualify for additional funding to support investigative response. An unusual mortality event may be declared based on one or a combination of the following criteria:

- A marked increase in the magnitude or a marked change in the nature of morbidity, mortality, or strandings occurs when compared with prior records;
- A temporal change is occurring in morbidity, mortality, or strandings;
- A spatial change is occurring in morbidity, mortality, or strandings;
- The species, age, or sex composition of the affected animals is different from that of animals that are usually affected;
- Affected animals exhibit similar or unusual pathological findings, behavior patterns, clinical signs, or general physical condition;
- Potentially significant morbidity, mortality, or stranding is observed in species, stocks, or populations that are particularly vulnerable (e.g., listed as depleted, threatened or endangered, or declining); and
- Morbidity is observed concurrent with or as part of an unexplained continual decline of a marine mammal population, stock, or species.

Unusual Mortality Events in 2006

At least seven incidents involving unusually high levels of mortality or morbidity of marine mammals occurred during 2006, including two unusual mortality events that began in 2005. The events and the species affected are described here.

Sea otters in Alaska: Beginning in November 2002 Alaska sea otters (*Enhydra lutris kenyoni*) began stranding in Alaska with confirmed cases of vegetative valvular endocarditis/septicemia (VE/S). The bacteria *Streptococcus bovis* complex or, more specifically, *Streptococcus infantarius* ssp. coli., has been a common finding in these cases. Stranded otters were found between Umnak Island in the eastern Aleutian Archipelago and Southeast Alaska, with the majority of cases occurring in Kachemak Bay. Most of the stranded animals with VE/S were from the south-central Alaska stock although several were from the southwestern stock, which is listed as threatened under the Endangered Species Act. A UME was declared on 24 August 2006. From November 2002 through December 2006, 53 percent (86/164) of the carcasses that were in good enough condition to necropsy were determined to have died from this disease complex, with 57 percent (41 animals out of 72 cultured), testing positive for *St. bovis* complex or *St. infantarius*. In 2006 alone, 99 carcasses were recovered, and 86 were necropsied. Of these, 49 had lesions typical of vegetative valvular endocarditis or septicemia. The *St. bovis* or *St. infantarius* bacteria were present in at least one organ or tissue in 16 of the

otters with VE/S lesions, and one otter without typical VE lesions was determined to have died from septicemia associated with *Streptococcus* spp. bacteria. At the end of 2006 the event was considered to be ongoing.

Multiple species in Florida, West Coast:

A bloom of the dinoflagellate *Karenia brevis* (i.e., Florida red tide), which produces brevetoxin, affected shallow waters off the west-central coast of Florida from January 2005 through February 2006 and again from late June 2006 through the end of 2006. Although its geographic extent changed over time, at its maximal extent the bloom covered an area of up to 67,500 km². Deaths of Florida manatees (*Trichechus manatus latirostris*), bottlenose dolphins (*Tursiops truncatus*), birds, fish, and sea turtles were associated with the bloom. At least 33 manatee carcasses were found along the west coast of Florida in March 2005, and an unusual mortality event was declared on 22 March. This was the third manatee event from red tides since 2001. The deaths of 92 manatees in 2005 and 38 in 2006 were attributed to brevetoxicosis.

Bottlenose dolphin deaths in the same area began in July 2005 and continued through December 2006. In both years, dolphin deaths occurred several months after the detection of *K. brevis* in the area. An unusual mortality event was declared for bottlenose dolphins on 10 November 2005 and later was combined with the manatee event as a multi-species mortality event, reflecting the fact that bird, fish, and sea turtle deaths also occurred in late summer of both 2005 and 2006.

In both years, the stranded dolphins were coastal bottlenose dolphins, with the exception of six offshore bottlenose dolphins, one Atlantic spotted dolphin (*Stenella frontalis*), and several unidentified delphinid carcasses. Seventy-nine dolphins stranded in 2005 and 115 in 2006. The dolphin strandings occurred in four distinct peaks. Tissue samples from the first peak in 2005 had relatively high levels of brevetoxin in liver, urine, and gastric contents. In early 2006,

during the second peak, brevetoxin was detected in some samples but at much lower concentrations. Unlike animals in the first peak, 12 dolphins examined during the second peak had skin lesions. The cause of the lesions is undetermined, but lesions from two of the animals tested positive for herpes virus. A third peak in strandings occurred in July 2006 and included several instances of human interaction, primarily ingestion of fishing gear. The fourth peak occurred in October 2006 around Lee County, Florida, with characteristics of a red-tide event. It appears that no consistent, single factor caused all these dolphin deaths, but brevetoxin was implicated in many of them.

In October 2006 an event summary and a request to close the event were submitted to members of the working group. The working group determined that the event would remain open while they considered how to manage the investigation of deaths under what appear to be almost chronic, repeated red-tide conditions. A combined multi-species report will be developed at the conclusion of the event.

Bottlenose dolphins in the Florida Panhandle: In addition to the multi-species event along Florida's west coast, a separate unusual mortality event involving bottlenose dolphins began in September 2005 along the Florida Panhandle. That event also was associated with a red-tide bloom but was considered to be distinct from the west coast event because of its geographic separation. It involved the stranding of 98 bottlenose dolphins between September 2005 and September 2006, when the event was declared closed. Brevetoxin has been confirmed in some samples, and skin lesions were present on at least five animals, but stomach content analysis, toxicology, and immuno-histochemistry results for the dolphins are still pending. Deaths of birds and sturgeon, garr, and anchovies also occurred along the Florida panhandle during the event and have been attributed to brevetoxin poisoning. The final report of the event is expected in 2007.

Florida manatees in Everglades National Park, Florida: From 9 November until 31 December 2006, 24 Florida manatees stranded within the Everglades National Park between the Broad River and the Monroe-Collier County line, and an unusual mortality event was declared on 27 December 2006. Although most carcasses were too decomposed for proper necropsy analysis, 9 out of 10 that were examined tested positive for brevetoxin. An additional four manatee carcasses were found outside the affected area during the same time period, and red tide was suspected as the cause of death. At the end of 2006, the event was considered to be ongoing. Due to the increased frequency of occurrence in recent years, at its annual meeting in 2007 the working group will be considering whether to designate manatee brevetoxicosis deaths as repeat rather than unusual events.

Harbor porpoises in the Pacific Northwest: Beginning on 11 January 2006, 62 harbor porpoises (*Phocoena phocoena*) were found stranded in the Pacific Northwest, mostly in coastal areas of Washington state. Two of those stranded porpoises were alive and released immediately; the rest died or were found dead. An unusual mortality event was declared on 3 November 2006. Samples were collected and examined from 37 porpoises, and at the end of 2006 histological results had been received for 25 animals. No common lesions, parasites, or infectious diseases were found among the majority of examined animals, although fishery interactions were implicated in three strandings and the microscopic fungus *Cryptococcus gattii* was present in at least six carcasses. *C. gattii* is native to Australia and was first detected on Vancouver Island in 1999. The fungus can reproduce in saltwater, where it is thought to have infected the porpoises through their blowholes. At the end of 2006 the event was ongoing, and an investigative team had been formed to study the strandings further.

Pinnipeds in the northeastern United States: In February 2006 two gray seals from Cape Cod were taken to a rehabilitation center in Maine where they died from morbillivirus infection. Researchers were immediately concerned because morbilliviruses have been responsible for significant marine mammal die-offs, including several in northern Europe and Russia involving tens of thousands of seals and several in the Mediterranean Sea and along the U.S. Atlantic and Gulf of Mexico coasts involving large numbers of dolphins. In addition, researchers were concerned that the strain of morbillivirus may be a different or substantially mutated strain from that isolated from previous outbreaks in Europe because gray seals have been involved for the first time and are potential carriers. An isolate of morbillivirus was taken from one of the animals that died in Maine and is currently being identified and compared with the virus that was responsible for the seal epizootics in northern Europe and Russia.

From June through September 2006 more than 300 pinnipeds stranded, and an unusual mortality event was declared on 20 October 2006. In addition to the wild seals, two captive California sea lions died suspiciously at an aquarium in Cape Cod in August 2006 where their tanks had been connected to open water; however, they both tested negative for morbillivirus. Other animals involved in the event included a mother/calf pair of bottlenose dolphins that were caught in open waters off New York. The mother tested positive for morbillivirus and died; the calf tested negative and is being rehabilitated. At least 20 other cases of morbillivirus have been detected in the northeastern United States. The total number of morbillivirus cases may be greater because 39 hooded seals exhibited neurological symptoms and died at a treatment facility without being tested for morbillivirus.

By the end of 2006 more than 1,100 pinnipeds had stranded in the northeastern region.

The majority of strandings occurred between June and September and involved adult seals; there were fewer strandings later in the year. In addition to morbillivirus, laboratory results also identified *Brucella*, herpes, leptospirosis, and biotoxins as contributing factors. In addition to the pinnipeds and dolphins, approximately 170 dead eiders were found in Wellfleet, Massachusetts, and five in Reid State Park, Maine, in October and November 2006. Their carcasses are being tested for avian influenza. In addition, samples from the 2003–2004 harbor seal event in Maine have been incorporated into this investigation, and some analyses of the past events are being reevaluated. Stranding network participants have developed a morbillivirus protocol and are anticipating a possible repeat event. At the end of 2006 the event was considered to be ongoing.

Humpback whales along the Atlantic coast: Between 10 July and 31 December 2006, 21 humpback whales (*Megaptera novaeangliae*) were found dead along the Atlantic coast, and an unusual mortality event was declared on 4 October 2006. Most animals were found in the northeastern United States, but two were found off Virginia. Necropsies could not be performed on 14 of the carcasses because they were far offshore. Necropsies were performed on four of the seven remaining animals. A bloom of *Alexandrium* spp., dinoflagellates that produce the neurotoxin saxitoxin, occurred in spring of 2006. Evidence of saxitoxin was found in only one of the necropsied animals; further analyses are being conducted. At the end of 2006 it was not clear whether the mortality event was associated with the dinoflagellate bloom. Four of the stranded animals had been entangled in fishing gear, as revealed by necropsy or observations of gear entangled around dead whales at sea. At the end of 2006 the event was considered to be ongoing.

Large whales in New England: Fifteen large whales stranded or were found dead at sea in New England waters in July 2005. On

16 August the working group declared a large whale unusual mortality event for northeastern U.S. waters. By 7 November 34 animals had been found dead at sea or onshore, including ten minke whales, seven humpback whales, four fin whales, one unidentified fin/sei whale, one sperm whale, one right whale, six unknown baleen whales, and two whales for which species could not be determined. Samples were collected from the nine whales that were near enough to shore to sample. A substantial algal bloom occurred in New England in the summer, and two minke whales tested positive for saxitoxin based on analysis of their stomach contents. The amounts of saxitoxin observed in the samples were relatively low and their toxicity is unknown. The working group was considering closure of this event early in 2006, but as of 31 December 2006 no official decision had been reached and the event remained open.

Release Criteria for Rehabilitated Animals

As discussed in previous annual reports, Congress included a provision in the 1992 Marine Mammal Health and Stranding Response Act directing the Secretary of Commerce to “develop and implement objective criteria to determine at what point a marine mammal undergoing rehabilitation is returnable to the wild.” Those criteria were to be completed by 4 November 1994. The National Marine Fisheries Service developed draft release criteria in 1997 in conjunction with the Fish and Wildlife Service and after consultation with marine mammal biologists, behaviorists, and veterinarians. The draft criteria were published for review and comment in 1998. They were revised to address comments received from the public and two expert advisory panels but were never finalized. In 2004 the National Marine Fisheries Service revised the draft release criteria again. The Fish and Wildlife Service reviewed the draft criteria and provided comments to the National Marine Fisheries Service in April 2005. In response to

a letter from the Commission recommending that final regulations or guidelines on releasing rehabilitated marine mammals be issued, the National Marine Fisheries Service indicated that it expected to complete a final product by the end of 2005. On 28 December 2006 the Service published a notice of intent to prepare a programmatic environmental impact statement for the Marine Mammal Health and Stranding Response Program. Presumably that statement will include an analysis of the revised draft release criteria and provide an opportunity for public comment on both the criteria and analysis.

The lack of objective criteria for the release of animals has led to confusion and controversy regarding the release of certain marine mammals. The primary concerns are transmission of disease, competition with wild populations for resources, genetic mixing of rehabilitated animals and the wild populations to which they were returned, and the ability of captive animals, specifically captive-born and long-term captives, to adapt to conditions in the wild. The completion of release criteria therefore seems critical both to marine mammals that may be candidates for release and to efforts to maintain the overall health of marine mammal populations in the wild.

Prescott Grant Program

The Marine Mammal Rescue Assistance Act of 2000 amended Title IV of the Marine Mammal Protection Act and instructed the Secretaries of Commerce and the Interior to conduct, subject to the availability of appropriations, a grant program to be known as the John H. Prescott Marine Mammal Rescue Assistance Grant Program. The program provides financial assistance for participants of marine mammal stranding networks to carry out critical activities including recovery or treatment of stranded marine mammals, collection of data from living and dead stranded marine mammals, and payment of operational costs directly related to those activities. Awards of up to

\$100,000 may be granted for a period of up to three years. An applicant may receive no more than two awards per competition.

The National Marine Fisheries Service administers the grant program because the Fish and Wildlife Service has neither requested nor received Prescott funds since the program's inception in 2001. The National Marine Fisheries Service, on the other hand, consistently has requested Prescott funds and awarded Prescott grants. For fiscal year 2006 the Service awarded grants totaling approximately \$3.7 million to 42 projects out of 78 submitted proposals. Technical and merit review panels evaluated the proposals and selected award winners. In June 2006 the Service solicited proposals for grants to be awarded in fiscal year 2007 and received 80 proposals.

Significant Events Related to Acoustic Impacts on Marine Mammals in 2006

During 2006 the Commission continued to monitor incidents and activities that bear on the issue of marine mammals and anthropogenic sound.

Beaked whale stranding, Almeria, Spain:

On the evening and night of 26 January 2006 four beaked whales stranded in the vicinity of Almeria, Spain. A necropsy performed by scientists from the Veterinary School, University of Las Palmas, Gran Canaria Island, Spain, indicated signs of vascular system gas bubbles similar to symptoms reported by the same scientists from strandings in the Canary Islands in 2002. The scientists hypothesized that the 2002 strandings were associated with naval sonar sound. Although vessels of the U.K. Royal Navy were in the general area at that time, officials did not confirm use of sonar in the area and time period when the strandings occurred. At the end of 2006 the scientists' findings had not been published and the question as to whether the U.K. Royal Navy had used sonar had not been resolved.

Pygmy sperm whale stranding, Cape Hatteras, North Carolina: Seven pygmy sperm whales were reported stranded on 1–2 September 2006 in the vicinity of Buxton, Cape Hatteras, NC. Coast Guard responders on the scene reported U.S. Navy ships in the area, but subsequent information did not reveal any sonar use in the area and time that the strandings occurred. As of the end of 2006 the National Marine Fisheries Service had not prepared a report on this stranding event, nor is it included in the Service's list of unusual mortality events.

U.S. legal proceedings: In October 2005 the Natural Resources Defense Council, International Fund for Animal Welfare, Cetacean Society International, League for Coastal Protection, Ocean Futures Society, and Jean-Michel Cousteau filed suit against the Department of the Navy for alleged violations of the National Environmental Policy Act (NEPA), the Endangered Species Act, and Marine Mammal Protection Act associated with the Navy's use of mid-frequency sonar in testing and training exercises. The plaintiffs contend that the Navy failed to (1) prepare adequate NEPA analyses for specific exercises, (2) informally or formally consult with the National Marine Fisheries Service with regard to impacts on listed endangered or threatened species as required by the Endangered Species Act, and (3) seek or obtain marine mammal incidental harassment authorizations or small-take permits as required by the Marine Mammal Protection Act. At the end of 2006 discussions between plaintiffs and government attorneys were continuing.

U.S. Navy SURTASS LFA Supplemental EIS: On 10 February 2006 the Marine Mammal Commission submitted comments to the U.S. Navy on a draft supplemental environmental impact statement (DEIS) for the Surveillance Towed Array Sensor System (SURTASS) Low-Frequency Active (LFA) sonar system. The SURTASS LFA DEIS was prepared in November 2005 for the following four purposes: (1) to address deficiencies in National Environmental Policy Act, Endangered Species Act, and Ma-

rine Mammal Protection Act compliance found by the U.S. District Court for the Northern District of California in its 26 August 2003 ruling; (2) to provide information necessary for application to the National Marine Fisheries Service for a new five-year incidental harassment rule to provide for incidental takes of marine mammals in accordance with Marine Mammal Protection Act; (3) to analyze the potential impacts for upgrades to the SURTASS LFA systems; and (4) to provide additional analyses and information pertinent to the actions proposed in the DEIS. The Commission provided its comments to the Navy (available on the Commission's Web site, www.mmc.gov) on 10 February 2006. The Commission agreed that small-boat or aerial visual surveys before and during SURTASS LFA operations were not practical, but it had reservations about the basis for conclusions concerning the threshold of biologically significant effects, the effectiveness of existing and proposed monitoring and mitigation measures, and the comparison of relative risks of the alternatives outlined in the DEIS. Specifically, the Commission questioned whether the use of a 180-db single-ping-equivalent sound energy threshold for biologically significant risk takes into account uncertainties about the outcome of sub-threshold exposures, citing potential masking effects and a need for more research to reduce such uncertainties. With regard to monitoring and mitigation measures, the Commission recommended that the Navy archive marine mammal monitoring data and use it to empirically evaluate the effectiveness of monitoring and mitigation measures and to predict "hot spots" for consideration as Offshore Biologically Important Areas. Finally, the Commission requested information on the anticipated proportion of coastal versus deep-water SURTASS LFA operations to assess whether a 25-nmi standoff proposed in alternatives 3 and 4 would result in greater risk than the 12-nmi standoff used in current SURTASS LFA operations and proposed in alternatives 1 and 2.

On 28 September 2006 the National Marine Fisheries Service issued a *Federal Register* notice requesting comments on a proposal to issue regulations under section 101(a)(5)(A) of the Marine Mammal Protection Act to allow marine mammals to be taken incidental to the use of SURTASS LFA by the Navy. In its 30 October 2006 letter to the Service, the Commission recommended that (1) the Service publish proposed regulations to govern the taking of marine mammals incidental to the deployment and use of both the LFA and compact low-frequency active (CLFA) sonar systems; (2) all necessary and relevant information from the multiple existing sources be consolidated into the proposed rule so that reviewers can more easily determine what is being proposed and assess the potential impact; (3) any regulations proposing to issue an incidental taking authorization for SURTASS LFA operations include information on the specific geographic locations where the sonar is expected to be deployed and the species and numbers of marine mammals that may be taken in each of those locations; (4) the existing annual review process for Letters of Authorization be retained in the new regulations but be expanded to accommodate public review and comment; and (5) the Service address the requirement of the National Defense Authorization Act of 2004 that personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity be considered in making a “least practicable adverse impact” determination under section 101(a)(5)(i)(II)(aa) in its proposed rule concerning LFA and CLFA activities.

As of the end of 2006 a final supplemental environmental impact statement was anticipated on or about May 2007, to be followed by a National Marine Fisheries Service rulemaking prior to expiration of the existing SURTASS LFA Letter of Authorization in August 2007.

U.S. Navy Undersea Warfare Training Range Draft Overseas EIS: On 18 January 2006 the Marine Mammal Commission submitted comments to the Navy regarding the

Navy’s October 2005 DEIS for the installation and use of an undersea training range at one of three proposed locations along the U.S. southeastern coast. In its letter, the Commission recommended that the Navy (1) provide better justification for sound exposure risk thresholds corresponding to Level A and Level B harassment; (2) describe the procedure used to generate marine mammal density estimates and the derived estimates of species and numbers of marine mammals potentially taken by Level A and Level B harassment; (3) acknowledge that the death or serious injury of even a single North Atlantic right whale would constitute a significant population-level effect; (4) provide detailed plans for surveying and monitoring programs over the long term, including further development of passive acoustic monitoring techniques using range assets; and (5) indicate when and how marine mammal observations will be evaluated to confirm the validity of risk estimates and estimates of mitigation effectiveness. Further development on the EIS has been subsumed under a Navy-wide plan for NEPA compliance of all major Navy test ranges to commence in 2007. Thus there was no further action on the specific matter in 2006.

Rim of the Pacific (RIMPAC) Exercise: The U.S. Navy’s Pacific Fleet sponsors biennial multi-national military exercises that take place in the vicinity of the Hawaiian Islands in late June through July. During the 2004 exercise, a large number of melon-headed whales (*Peponocephala electra*) entered Hanalei Bay, Kauai, Hawaii, and stayed there for more than a day—an unusual event that some attributed to naval sonar activities in the region. However, others noted that a similar event took place off the island of Rota in the Northern Mariana Islands on the same day and that in the past similar milling events have occurred in Hawaii and other parts of the Pacific.

In 2006 the Navy sought and obtained an incidental harassment authorization (IHA) for the RIMPAC 2006 exercise. The Natural Resources Defense Council (NRDC) and

co-plaintiffs sued the Navy on 28 June 2006, claiming that the risk posed by the exercise exceeded the intent of an IHA and that an environmental impact statement, not an environmental assessment, was the appropriate level of analysis under NEPA. The Navy then sought a National Defense Exemption from the Marine Mammal Protection Act from the Secretary of Defense, which was granted for a period of six months, starting 30 June 2006. NRDC argued that the exemption did not apply to the Navy's obligations under NEPA. The court agreed, and in its temporary injunction requested that the parties seek to settle their differences prior to a determination by the court, which they did on 7 July 2006. The revised conditions under which the Navy RIMPAC exercise went forward on 10 July 2006 included aerial and shipboard visual observations for marine mammals before and during sonar use; criteria for the reduction or complete shutdown of Navy antisubmarine sonar systems if marine mammals were sighted near the source vessel(s); passive acoustic monitoring for marine mammals during the exercise; publication of a hotline number for reporting strandings; and buffer zones around the main Hawaiian Islands and the Northwestern Hawaiian Islands National Monument.

Minerals Management Service Projects: In 2006 the Minerals Management Service completed its Final Report on Selected Environmental Information for Norton Basin, Chukchi Sea/Hope Basin, and Cook Inlet Planning Areas for the Alaska Outer Continental Shelf (OCS) region. These and other research reports are listed on the Service's Web site (www.mms.gov). In addition, the Service provides a list of its permit activities, including geophysical exploration using air guns (see www.mms.gov/alaska/re/recentgg/recentgg.htm). Also in 2006 the Service completed its five-year sperm whale seismic survey in the Gulf of Mexico. A final report is anticipated in 2007. The Commission did not provide comments on these activities in 2006.

Oil and Gas Industry: Early in 2005, nine oil and gas companies formed a Joint Industry Program (JIP) with the goal of systematically *surveying existing knowledge gaps* about underwater sound and its effects on animals. This effort, known as JIP Phase 1, began with a review of knowledge gaps, regional regulations, relevant international treaties and laws, potential funding partners, and existing research programs on sound and marine animals. In September 2005 the JIP convened an international workshop in Halifax, Nova Scotia, seeking stakeholder input on research that would be needed to close the identified knowledge gaps.

The JIP has entered Phase 2, which is intended to *fund research to address the data gaps*. Membership grew to 14 companies and, as of September 2006, JIP Phase 2 funds have reached approximately \$8.1 million per year. The program has entered into cofunding agreements with several government agencies to support research of mutual interest and continues to seek partners worldwide. (See www.soundandmarinelife.org for details.)

National Science Foundation: In October 2005 the National Science Foundation announced its intent to prepare a programmatic/overseas environmental impact statement to describe potential impacts on the marine environment from seismic research conducted by U.S. academic scientists and supported by the foundation. The National Marine Fisheries Service was invited to participate in the preparation of the statement as a cooperating agency. To begin the process, the National Science Foundation held a series of public scoping meetings across the country in October 2005. Updates on preparation of the statement were not available in 2006, but efforts presumably were under way.

In 2006 two planned NSF-funded geophysical research projects were cancelled or delayed because of concerns regarding their potential environmental impacts. One was planned for the Bermuda area and the other was planned

off the coast of British Columbia (Batholiths Project). Review of the Batholiths permit by the Canadian Department of Fisheries and Oceans was still under way at the end of 2006.

National Oceanic and Atmospheric Administration: In 2003 the National Marine Fisheries Service convened an expert panel to prepare a draft report on the effects of sound on

marine mammals. The goal is to have a peer-reviewed expert scientific analysis of existing knowledge to serve as a possible basis for regulatory guidance. A draft report was submitted for peer review in 2006. The goal of the project is to publish the report as a peer-reviewed article in an independent professional journal in 2007.

Chapter XI

RESEARCH AND STUDIES PROGRAM

The Marine Mammal Protection Act requires that the Marine Mammal Commission maintain a continuing review of research programs conducted or proposed under authority of the Act, undertake studies as it deems necessary or desirable in connection with marine mammal conservation and protection, and take every step feasible to prevent duplication of research. To accomplish these tasks, the Commission convenes meetings and workshops to review, plan, and coordinate marine mammal research. It also awards grants for studies to identify and develop solutions to domestic and international problems affecting marine mammals and their habitats. It seeks to facilitate and complement activities of the National Marine Fisheries Service, the Fish and Wildlife Service, the U.S. Geological Survey, and other federal agencies. Further, it recommends steps that should be taken to prevent unnecessary duplication and enhance the quality of research conducted or supported by other agencies.

Workshops and Planning Meetings

During 2006 the Commissioners, members of the Committee of Scientific Advisors on Marine Mammals, and staff helped organize and participated in meetings and workshops on the following topics:

- the North Atlantic right whale research and management program review;
- the National Marine Fisheries Service's Stock Assessment Improvement Plan, Tier III;
- the development of listing standards under the Endangered Species Act;
- oil and gas development off Sakhalin Island, Russia, and its effects on the western population of North Pacific gray whales (*Eschrichtius robustus*) through an international panel sponsored by IUCN–The World Conservation Union;
- plans for conservation of the Yangtze River dolphin, or baiji (*Lipotes vexillifer*);
- international Arctic policy issues, the U.S. involvement in them, and the potential role of the Marine Mammal Commission in supporting U.S. involvement;
- the assessment of the efficacy of the National Marine Fisheries Service process for reviewing marine mammal research permit applications and issuing permits under the Marine Mammal Protection Act and the Endangered Species Act;
- research and conservation of the genus *Sotalia*, or tucuxi;
- seismic surveys and their potential impacts on cetaceans (hosted by the International Whaling Commission);
- the Alaska Forum on the Environment;
- research on foraging behavior of Hawaiian monk seals (*Monachus schauinslandi*);
- photo-identification studies of spinner dolphins (*Stenella longirostris*);
- stranding events in Hawaii; and
- various meetings of Alaska Native organizations.

In addition, Commission staff participated on several interagency committees, teams, and working groups focused on issues of concern for marine mammals, including the following:

- Joint Subcommittee on Ocean Science and Technology and its subcommittees on ocean partnerships, ocean observations, marine debris, and harmful algal blooms, hypoxia, and human health;
- recovery teams, including Hawaiian monk seal, right whale (*Eubalaena glacialis*) (Southeast Implementation Team), and Florida manatee (*Trichechus manatus*) (Warm-Water Task Force);
- take reduction teams, including pelagic longline, Atlantic trawl gear, and Atlantic large whale teams;
- scientific review groups convened under the Marine Mammal Protection Act;
- the Arctic Policy Group;
- the Interagency Coordinating Group on Ocean Sound;
- the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve Advisory Council; and
- the North Pacific Research Board Science Panel.

Commission-Sponsored Research and Study Projects

As funding permits, the Marine Mammal Commission supports research to further the purposes of the Marine Mammal Protection Act. In particular, it convenes workshops and awards grants for research and studies to help identify and determine how best to minimize threats to marine mammals and their habitats. The research program funds studies that are essential for marine mammal conservation, including proposals that originate from within the Commission, those that are submitted to the Commission as unsolicited proposals, and those that are submitted in response to a general request for proposals. Since it was established in 1972, the Commission has funded more than

1,000 projects ranging in amounts from several hundred dollars to \$150,000. Final reports of most Commission-sponsored studies are available from the National Technical Information Service or directly from the Commission.

During 2006 the Commission awarded eight grants totaling approximately \$300,000; eight additional grants (totaling approximately \$225,000) were awarded at the end of 2005 (i.e., during fiscal year 2006) but were not reported in the Commission's previous annual report. Two of those grants provided funds to help offset publication and distribution costs for *SireNews* and the *Latin American Journal of Aquatic Mammals*. Brief descriptions of the projects supported by other grants are provided here.

Protected Species Stock Assessment Improvement Plan—Tier III Workshop (National Marine Fisheries Service, Silver Spring, MD)

The National Marine Fisheries Service is developing a plan to improve its approach toward and capabilities for conducting stock assessments. The Stock Assessment Improvement Plan is being developed over several years and in three phases or tiers. Tier I identified the steps necessary to improve stock assessments given currently available resources. Tier II identified the steps, funding, and resources necessary to provide assessments of all marine mammal and turtle stocks at a level sufficient to meet the mandates of the Endangered Species Act and Marine Mammal Protection Act. Tier III involves identification of the steps necessary to expand observation and research programs beyond the traditional single-species approach and move toward an ecosystem-based approach. With funding from the Commission, the Service held a workshop on 7–10 March 2006 to develop its vision of an ecosystem approach to management for protected species and to discuss the data collection and research necessary to support that vision. The workshop was followed by additional discussions within the Service to prepare a Tier III requirements

plan, which will culminate in an expanded version of the stock assessment improvement plan report to be completed in spring 2007.

Support for an aerial survey of the Pacific walrus population (U.S. Fish and Wildlife Service, Anchorage, AK)

Between 1975 and 1990 the United States and Russia conducted joint aerial surveys at five-year intervals to monitor the size and trend of the Pacific walrus (*Odobenus rosmarus di-virgens*) population. Rangewide surveys were suspended in 1995 due to unresolved problems with survey methods and shrinking research budgets in both nations. The objective of this project was to restart the monitoring effort using an airborne scanner system with a thermal detector. This new technique should allow better coverage of larger areas than previous surveys. The technique relies on recording the heat produced by walrus groups hauled out on sea ice and then estimating the number of walruses based on the relationship between the walrus group size (photographic data) and the heat produced (thermal data). The method has been tested in preliminary surveys and seems to work well. The Fish and Wildlife Service and its Russian counterparts conducted a rangewide survey of Pacific walruses in 2006. The Commission supported the survey by providing funds to rent the hardware necessary to geographically reference the thermal survey data. Georeferencing allows easier calibration of thermal data by improving the ability to link specific thermal “signatures” to specific aerial photographs of walrus groups taken at the same time by a second survey plane flying at lower altitude. The calibration, in turn, improves the precision of the final population estimate, which will make it easier to detect future trends in the population. Additionally, the georeferenced data can be combined with other types of information to analyze relationships between walrus distribution and habitat variables and perhaps predict the future availability of walrus habitat in conjunction with

climate model projections. A final report of this project is expected late in 2007.

Initiating a multi-species collaborative cetacean photo-identification catalog for the Pacific Islands region (National Marine Fisheries Service, Pacific Islands Fisheries Science Center, Honolulu, HI)

Spinner dolphins in Hawaiian waters face increasing pressure from the developing ecotourism industry, particularly the so-called “swim with the dolphins” programs. Very little is known about spinner dolphins’ population biology and stock structure, which are important factors in determining their vulnerability to disturbance. The objective of this project was to support the development of a multi-species photo-identification catalog that will integrate the efforts of various researchers conducting photo-identification studies on spinner dolphins and other species in the waters of the Pacific Islands region. The catalog will provide insights into the population status and habitat-use patterns of these species, which in turn will provide a basis for assessing potential effects of ecotourism activities. A workshop was convened 11–12 December 2006 in Honolulu to (1) discuss research and management priorities for spinner dolphins in Hawaii, (2) present examples of established collaborative catalogs and photo-identification tools (database/catalog organization software), (3) provide a venue for researchers to explore the idea of developing and contributing to a collaborative catalog project, (4) query local researchers on how best to approach such a project, and (5) develop a steering committee or working group to move the process forward. A report of the workshop is expected in 2007.

A survey for odontocete cetaceans off Kauai and Niihau (Cascadia Research Collective, Olympia, WA)

Considerable uncertainty exists regarding the population structure and population size of most species of odontocetes in the Hawai-

ian Islands. The Hawaiian stock of false killer whales (*Pseudorca crassidens*), in particular, is quite small (estimated at 268 individuals) and is considered strategic under the Marine Mammal Protection Act because the incidental take in the Hawaiian longline fishery exceeds the stock's potential biological removal level. The Commission provided partial support for a small-boat-based survey for odontocetes off the islands of Kauai and Niihau in October and November 2005 to photograph and identify individuals and collect genetic samples for examining stock structure. Photographs of distinctive individuals of three species (bottlenose dolphins [*Tursiops truncatus*], rough-toothed dolphins [*Steno bredanensis*], and short-finned pilot whales [*Globicephala macrorhynchus*]) were obtained and compared with previously collected data off Kauai, Niihau, Oahu, Maui, Lanai, and the island of Hawaii. Movements of photographically identified bottlenose dolphins were documented between deep-water areas off the islands of Kauai and Niihau, as well as between shallow (<350 m) and deep (>350 m) waters. No false killer whales were sighted off Kauai or Niihau during the study. The final report of this project is available from the Commission upon request.

Ingotuks and ice: Relating bowhead whale body condition and reproduction to summer ice conditions in the changing Beaufort Sea (University of Massachusetts-Amherst)

Arctic summer sea ice has been diminishing over the past three decades, and some models predict a seasonally ice-free Arctic by 2050. The biological effects of declining sea ice extent and duration are poorly understood and are likely to vary regionally and seasonally. For gray whales and right whales, calf production has been linked to changes in ice cover, but little is known about the factors that affect fecundity and productivity of bowhead whales. This project will investigate and quantify the correlations between bowhead whale calf production, adult body condition, and sea-ice cover in the whales'

summer and autumn habitat in the Beaufort Sea, where sea-ice retreat in those seasons has been extreme. A better understanding of these linkages is important for the conservation of this species and may lead to better management decisions regarding safe harvest quotas. A final report of this project is expected in 2007.

IUCN project to develop Red List default criteria (Aquatic Farms Ltd., Kaneohe, HI)

The IUCN Red List Program is conducting a global reassessment of the status of cetacean species and populations. A large workshop is planned for that purpose in January 2007. The workshop will assess all cetacean species based on the 2001 Red List categories and criteria. For most cetacean species, however, direct demographic data are not available, and therefore criteria cannot be applied without assigning default values for such things as generation time and percentage mature. An approach developed in 2003 uses a simplified Leslie matrix that requires only a few demographic parameters: calf and non-calf survival rate, age of first reproduction, and crude birth rate. The objective of this current project is to conduct a literature review to gather the necessary data for applying the Leslie matrix analysis to as many cetacean species as possible. Once the data have been compiled, standard formulas can be used to estimate generation time and percentage mature for each species, which in turn can be used to conduct Red List assessments. The final report of this project will be completed prior to the January 2007 workshop and will be provided to workshop participants to facilitate the Red List assessments.

Development of monitoring strategies for selected Arctic marine mammals (U.S. Fish and Wildlife Service, Anchorage, AK)

Environmental conditions in the Arctic are changing rapidly, affecting both terrestrial and marine ecosystems. Projections indicate that in the foreseeable future, sea ice could decrease to the point where the Arctic is ice-free in the sum-

mer months. Human activities (for example, oil and gas production, mining, marine transport, commercial fishing, and tourism) in the Arctic are expected to increase as a consequence of warmer temperatures and longer open-water seasons. With increased activity comes increased risk of deleterious effects on ecosystems, although such effects may be avoided or mitigated if they are identified and addressed prior to or early in the development of new industrial ventures. In the face of a broad range of potential changes, robust monitoring programs are needed to effectively manage those activities and conserve Arctic wildlife. Monitoring programs should detect important changes in the status of the target wildlife population or species, identify the natural or anthropogenic cause or causes of those changes, and, most important, do so in time to allow the development and implementation of effective strategies to mitigate anthropogenic threats so that the target populations or species can persist and maintain their roles in the ecosystem. As discussed in Chapter V of this report, the Marine Mammal Commission, working with the Fish and Wildlife Service, will convene a workshop in 2007 to develop monitoring plans for two Arctic marine mammal species, the ringed seal (*Phoca hispida*) and the beluga whale (*Delphinapterus leucas*). These species were selected because of their circumpolar distribution, the availability of historic and recent data on their status in at least some regions, and their importance to indigenous communities. Final monitoring plans for both species are expected in late 2007 or early 2008. The final plans will be shared with the Arctic Council's Circumpolar Biodiversity Monitoring Project, relevant management agencies in all Arctic nations, and all interested parties.

Assessing changes in the diet of polar bears (Mote Marine Laboratory, Sarasota, FL)

The biological and physical consequences of climate change are already being observed in Alaska and other Arctic regions where ma-

rine mammals have exhibited changes in their distribution, local density, and body condition. Small modifications in diet associated with ecosystem changes may have dramatic effects on polar bears (*Ursus maritimus*) and other species that are specialized foragers. Studies of polar bear health, nutrition, and ecology may prove important for polar bear conservation but also may serve as an indicator of ecosystem problems. This project will investigate potential changes in feeding habits by polar bears from the Chukchi/Bering Seas stock, as monitored through fatty acid analysis of historical and current polar bear tissue samples. The study will investigate whether, and to what extent, polar bear diets have changed in the Bering Strait region. The results will be used to make inferences regarding likely changes in the availability of polar bear prey through time, the nutritional and general status of polar bears, and the utility of using polar bear biology and status as an indicator of ecosystem change. A final report of this project is expected in 2007.

Investigations of killer whale predation in southeastern Alaska (North Gulf Oceanic Society, Sitka, AK)

Predation by killer whales (*Orcinus orca*) has been implicated as a possible cause for the decline of several marine mammal populations in western Alaska. Some scientists have speculated that killer whales sequentially depleted several stocks of pinnipeds, switching their predatory focus from one species to the next as each stock was depleted. This hypothesis is the subject of ongoing scientific debate. Whether and how killer whales respond to changes in the availability of their primary prey warrants investigation. In southeastern Alaska, so-called transient killer whales forage primarily on Steller sea lions (*Eumetopias jubatus*), Dall's porpoises (*Phocoenoides dalli*), harbor porpoises (*Phocoena phocoena*), and harbor seals (*Phoca vitulina*). Populations of these prey species in this area are stable or increasing, except in Glacier Bay where harbor seals have declined by

more than 70 percent during the past decade. At the same time, sea otters (*Enhydra lutris*) in Glacier Bay have increased from zero in 1992 to 2,400 in 2004. The purpose of this project is to investigate whether killer whales switch from harbor seals to sea otters as these species change in abundance. The project also will investigate the prey preferences of the killer whales that have been seen in Glacier Bay when they travel to other areas of southeastern Alaska. The aim of this study is to provide insights into variation in killer whale prey selection in response to changing availability of different prey types. A final report of this project is expected in 2007.

Evaluating habitat-based reclassification criteria for the Endangered Species Act: Manatees as a case study (Florida Fish and Wildlife Conservation Commission, St. Petersburg, FL)

The Florida Manatee Recovery Plan called for the identification, evaluation, protection, and monitoring of habitat as a difficult challenge that is nonetheless essential for protecting the Florida manatee. To that end, a habitat working group was convened and is seeking to develop a quantitative process for evaluating and monitoring the status of manatee habitats over the long term. This project will develop a comprehensive GIS database of habitat and other information (such as bathymetry/hydrography, vegetation/forage types, water temperatures, and human uses) that can be used to conduct regular habitat assessments. The resulting database will be useful for analyzing habitat quality, changes in quality, and the implications for recovery of the Florida manatee. The database is expected to be completed in 2007.

A survey of Florida springs to determine accessibility to Florida manatees: Developing a sustainable thermal network (Wildlife Trust, St. Petersburg, FL)

Limitations on the range of the endangered Florida manatee are largely determined by water temperature and the animals' susceptibility

to cold stress. Manatees have learned to use artificial warm-water sources, such as power-plant outfalls, where the abundance of warm water sustains them through the winter. These warm-water sources will become less reliable—or possibly disappear altogether—as power plants age, are decommissioned, and are replaced by new technologies. When that occurs, manatees will be forced to rely on natural warm-water springs. However, those springs are threatened by increasing human population and associated water-use and land-use patterns, pollution, and other forms of habitat modification. This project evaluated current and potential use of springs by the Florida manatee, including impediments to access and opportunities to improve access. Because the loss of warm-water habitat represents a serious long-term threat to survival of the species, increasing and maintaining the availability of warm-water habitat will be essential for conservation. These studies also will assist the Habitat Working Group in conducting its habitat checklist. The checklist will evaluate warm-water sites around the state of Florida and eventually will be used to revise the manatee habitat recovery criteria. A final report from this project was submitted in October 2006 to the Marine Mammal Commission, the Florida Manatee Recovery Team, and the Warm-Water Task Force. The report is available on the Commission's Web site at <http://www.mmc.gov/reports/contract/taylor.html>.

Development of construction plans for a possible solar-powered warm-water manatee refuge in Brevard County, Florida (University of Central Florida)

To survive cold periods, most Florida manatees retreat to isolated warm-water refuges such as natural springs or power-plant outfalls. Many power plants along the east coast of Florida are approaching or have exceeded their planned operational lives, and it is likely that some plants will be retired within the next 10 years. Their closure could result in the deaths

of a large number of the manatees that rely on the outfalls of such plants in winter. The development of temporary alternative warm-water refuges could prevent such deaths in the near term and provide the time necessary to gradually reduce the number of animals dependent on artificial warm-water sources. The purpose of this project is to develop detailed construction plans, including architectural drawings and cost estimates, for building an enclosed warm-water basin for manatees with an associated solar-powered water-heating system. The basin would be built at the warm-water outfall of the Reliant Energy Power Plant in Brevard County, Florida, at the northern end of the population's current winter range. A draft report with the detailed plans is expected in 2007. The report of an earlier related project, "Assessment of Thermal Heating Requirements for Non-Industry Dependent Warm-Water Refuges for Florida Manatees," is available on the Marine Mammal Commission's Web site, <http://www.mmc.gov/reports/contract/lgu.html>.

Evaluation of the potential for emergency use of morbillivirus vaccination in Hawaiian monk seals: Development of a tool to prevent extinction of an endangered species (Robert Braun, D.V.M., Kaneohe, HI)

The endangered Hawaiian monk seal is threatened by habitat loss, fisheries interactions, food limitation, toxins, male aggression, entanglement, shark predation, human disturbance, vessel groundings, and infectious disease. Seals throughout the Hawaiian archipelago do not have detectable antibodies to morbilliviruses, and scientists are concerned that a disease outbreak similar to those that have occurred in European harbor seals could lead to this species' extinction. The investigator convened a workshop on 3–4 November 2005 to determine whether a vaccination regime should be developed for Hawaiian monk seals that could be implemented in the event of a morbillivirus epidemic. Experts in Hawaiian monk seal biol-

ogy, infectious diseases, molecular diagnostics, epidemiology, ecology, and vaccination of terrestrial wildlife and marine mammals evaluated the feasibility of developing a vaccine against morbillivirus and the advisability of initiating a vaccination program in the event that this potentially devastating disease should be detected in Hawaiian monk seals or in a nearby carnivore population (e.g., a canine distemper outbreak on the main Hawaiian Islands). In the workshop report provided to the Commission in 2006, participants recommended that the National Marine Fisheries Service's Pacific Islands Fisheries Science Center proceed immediately with further investigation and planning for development of a morbillivirus vaccine for Hawaiian monk seals. Participants also provided a series of recommendations regarding research and other activities that should occur before or as part of the development of such a vaccination plan. The investigator is collaborating with other researchers to review historic vaccine trials and morbillivirus vaccines used on pinnipeds, particularly phocids. The review includes an evaluation of the safety and efficacy of those vaccines in aquatic and terrestrial species. The investigator also will collaborate with a vaccine subcommittee composed of workshop participants to develop recommendations of vaccines to test and a protocol for conducting vaccine trials. A report of this additional work is expected in 2007.

Continuation of the analysis of Florida manatee mortality data (Montana State University, Bozeman, MT)

Since 1978 detailed necropsies have been performed on all retrieved Florida manatee carcasses, yet the most recent 10 years of data have not been fully analyzed and used to inform management. To that end, two models were proposed to evaluate the dataset. The first was a Bayesian age-length model to address uncertainty in age estimates and to allow for age estimation of carcasses for which only lengths are available. The second was a similar model

to examine the relationship between length and the probability of a small animal dying at or shortly after birth. The objectives of this project are to use these models to determine the age structure of the carcass sample and to develop a model to determine survival rates of young animals using the age structure of the carcass sample. The models have been created, tested,

and reviewed by researchers at Florida Fish and Wildlife Research Institute. Preliminary analyses were presented at an April 2006 meeting of experts convened to discuss options for improving the Florida manatee mortality database. A final report of the project is expected in 2007.

Appendix

2006 MARINE MAMMAL COMMISSION RECOMMENDATIONS AND AGENCY RESPONSES

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
3 January to National Marine Fisheries Service	<p>Regarding the Service's request for comments on a proposed rule to revise the current critical habitat designation for the northern right whale by designating additional areas within the North Pacific Ocean, the Commission recommended that the Service—</p> <ul style="list-style-type: none">• take into account the habitat needed to promote recovery of the population, including areas that may not currently be occupied by the remnant population;• include the eastern Aleutian Island passes from Unimak Pass to and including Umnak Pass among the areas designated as critical habitat;• review sighting/catch records for North Pacific right whales over the past century and designate as critical habitat those areas where whale concentrations overlap with known areas of prey concentration or where whale concentrations suggest that areas once served as important feeding grounds; and• conduct research needed to assess habitat-use patterns, including habitat used for breeding and calving; stock structure; population abundance, composition, and condition; and risk factors that may have impeded the recovery of the North Pacific right whale.	The final rule had not been published at the end of 2006.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
<p>3 January to Fish and Wildlife Service</p>	<p>Regarding the Service’s request for comments on the Draft Supplemental Environmental Impact Statement on the Translocation of Southern Sea Otters, the Commission recommended that the Service—</p> <ul style="list-style-type: none"> • take appropriate steps to implement the proposed management action to retain the population of otters at San Nicolas Island and not remove otters from the “no-otter” management zone; • consult with the National Marine Fisheries Service under section 7 of the Endangered Species Act on the potential impacts of the proposed action on white abalone and black abalone; • seek the views of the California Department of Fish and Game on the potential impacts of sea otter range expansion on abalone species; and • work with these agencies and the Abalone Recovery Team to monitor the impact of the proposed action on protected abalone populations. 	<p>The environmental impact statement had not been finalized at the end of 2006.</p>
<p>13 January to National Marine Fisheries Service</p>	<p>Regarding an advance notice of proposed rulemaking on whether to promulgate regulations to protect spinner dolphins in the main Hawaiian Islands, the Commission recommended that the Service promptly move forward with a proposed rule that—</p> <ul style="list-style-type: none"> • closes those areas identified as the dolphins’ most important resting areas to all human activities, either during specified hours or when dolphins are present; • allows access to other areas used by dolphins, subject to certain operating conditions (which might include speed limits, limits on the number of vessels, etc.); • establishes generally applicable rules for all other areas, specifying minimum approach distances (e.g., no approaches closer than 50 yards) and other limitations (e.g., no touching animals, no pursuing animals, etc.); and • provides the maximum possible clarity for enforcement purposes. 	<p>The proposed rule had not been published at the end of 2006.</p>

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
18 January to Department of the Navy	Regarding the Navy's Draft Overseas Environmental Impact Statement/Environmental Impact Statement—Undersea Warfare Training Range, the Commission recommended that the Navy prepare and circulate a supplemental environmental impact statement that provides better justification for threshold energy flux densities for Level A and Level B harassment; describes the data and procedures used to generate the density estimates and the estimates of the species and numbers of marine mammals that potentially could be taken by Level A and Level B harassment; acknowledges that the death or serious injury of a single North Atlantic right whale would constitute a significant population-level effect; provides detailed plans for surveying and monitoring programs over the long term to include further development of acoustic techniques using range assets; and indicates when and how the marine mammal observational data will be evaluated to confirm the validity of the estimates.	
6 February to National Marine Fisheries Service	Regarding permit application no. 532-1822 (Kenneth C. Balcomb III), the Commission recommended approval with provisions. The application proposed the taking by harassment of up to 88 southern resident killer whales annually during photo-identification studies to monitor the population's size and demographics, movements and distribution, social structure, and individual health and body condition.	The permit was issued on 12 April 2006. The Commission's recommended provisions were adopted.
6 February to National Marine Fisheries Service	Regarding permit application no. 965-1821 (David E. Bain, Ph.D.), the Commission recommended approval with provisions. The application proposed the taking by harassment of up to 88 southern resident killer whales annually and an unspecified number of killer whales from non-listed populations during vessel-based and aerial observations, still and video photography, and culture of microorganisms in exhalations.	The permit was issued on 12 April 2006. The Commission's recommended provisions were adopted.
6 February to National Marine Fisheries Service	Regarding a request to amend permit no. 731-1774 (Robin W. Baird, Ph.D.), the Commission recommended approval with provisions. The request proposed amending the permit to authorize the suction-cup tagging of up to 15 southern resident killer whales annually (to assess inter-annual variability in diving patterns) and up to 100 takes by harassment annually during close approaches for photo-identification and behavioral studies.	The permit amendment was issued on 12 April 2006. The Commission's recommended provisions were adopted.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
6 February to National Marine Fisheries Service	Regarding permit application no. 540-1811 (John Calambokidis), the Commission recommended approval with provisions. The application proposed taking by harassment of up to 26 species of cetaceans and up to 5 species of pinnipeds during studies of the distribution, abundance, habitat use, and feeding behavior of marine mammal populations in the eastern North Pacific.	The permit was issued on 12 April 2006. The Commission's recommended provisions were adopted.
6 February to National Marine Fisheries Service	Regarding a request to amend permit no. 782-1719-03 (National Marine Mammal Laboratory), the Commission recommended approval with provisions. The request proposed amending the permit to authorize the opportunistic taking by harassment of southern resident killer whales by biopsy sampling, photo-identification, and aerial and vessel surveys to study killer whale feeding ecology.	The permit amendment was issued on 12 April 2006. The Commission's recommended provisions were adopted.
6 February to National Marine Fisheries Service	Regarding a request to amend permit no. 774-1714-04 (Southwest Fisheries Science Center), the Commission recommended approval with provisions. The request proposed amending the permit to distribute authorized takings of killer whales by biopsy sampling and photo-identification between southern resident killer whales and other populations of killer whales.	The permit amendment was issued on 12 April 2006. The Commission's recommended provisions were adopted.
6 February to National Marine Fisheries Service	Regarding permit application no. 781-1824 (Northwest Fisheries Science Center), the Commission recommended approval with provisions. The application proposed taking by harassment, tagging, and biopsy sampling 19 cetacean species for studies of abundance, distribution, movement patterns, habitat use, contaminant levels, prey, behavior, energetics, and stock structure of cetaceans in U.S. territorial and international waters.	The permit was issued on 12 April 2006. The Commission's recommended provisions were adopted.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
21 February to National Marine Fisheries Service	<p>Regarding a request by the Scripps Institution of Oceanography for authorization to take small numbers of marine mammals by harassment incidental to conducting a marine seismic survey in the eastern tropical Pacific Ocean, the Commission referred the Service to its 18 December 2005 comments and recommendations on a previous, similar request by Scripps and recommended that—</p> <ul style="list-style-type: none"> • to improve ability to observe marine mammals, the Service require that the applicant not initiate ramp-up of airguns after dark; and • operations be suspended immediately if a dead or seriously injured marine mammal is found in the vicinity of the operations and the death or injury could have occurred incidental to conducting the seismic survey. 	The incidental harassment authorization was issued on 9 March 2006. The Service stated that it had adopted the Commission's recommendations as requirements in the incidental harassment authorization.
23 February to National Marine Fisheries Service	Regarding application no. 948-1814 (Terrie Williams, Ph.D.) the Commission recommended approval with provisions. The application proposed capturing up to 20 adult Weddell seals annually over five years to investigate the behavioral and energetic adaptations that enable Weddell seals to forage in the Antarctic fast-ice environment, particularly in the dark.	The permit was issued on 22 June 2006. The Commission's recommended provisions were adopted.
24 February to National Marine Fisheries Service	<p>Regarding a request from Eglin Air Force Base for authorization to take small numbers of marine mammals incidental to conducting air-to-surface gunnery missions in the Gulf of Mexico, the Commission recommended that the Service require that—</p> <ul style="list-style-type: none"> • operations be suspended immediately if a dead or seriously injured marine mammal is found in the vicinity of the operations and the death or injury could have occurred incidental to conducting the seismic survey. The Commission noted that any such suspension should remain in place until the Service has (1) reviewed the situation and determined that further deaths or serious injuries are unlikely to occur, or (2) issued regulations authorizing such takes under section 101(a)(5)(A) of the Marine Mammal Protection Act. 	The incidental harassment authorization was issued on 3 May 2006. The Commission's recommendation was adopted.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
3 March to National Marine Fisheries Service	<p>Regarding a request from the California Department of Transportation to take small numbers of marine mammals incidental to construction of a replacement bridge for the east span of the San Francisco–Oakland Bay Bridge, the Commission recommended that the Service—</p> <ul style="list-style-type: none"> • address the possibility that proposed visual monitoring for marine mammals would be compromised in the late afternoon and early evening during winter months; and • revise its across-the-board definition of temporary threshold shift (TTS) from Level B to Level A harassment. 	<p>The incidental harassment authorization was issued on 27 April 2006. The Service responded that—</p> <ul style="list-style-type: none"> • marine mammal observers will use nighttime infrared scopes or other tools to conduct monitoring during low light conditions; and • reclassification of TTS is irrelevant for this incidental harassment authorization because mitigation and monitoring requirements should prevent TTS.
29 March to National Marine Fisheries Service	<p>Regarding a request from ASRC Energy Services, Lynx Enterprises, Inc., to take small numbers of marine mammals by harassment incidental to on-ice vibroseis seismic operations, the Commission recommended that—</p> <ul style="list-style-type: none"> • proposed monitoring programs be expanded to collect more general data on changes in density and abundance of potentially affected marine mammals, reproductive rates, prey availability, foraging patterns, distribution, and contaminant levels where oil and gas exploration, development, and production occur; and • operations be suspended immediately if a dead or seriously injured marine mammal is found in the vicinity of the operations and the death or injury could have occurred incidental to conducting the seismic survey, and that any such suspension should remain in place until the Service has (1) reviewed the situation and determined that further deaths or serious injuries are unlikely to occur, or (2) issued regulations authorizing such takes under section 101(a)(5) (A) of the Marine Mammal Protection Act. 	<p>The incidental harassment authorization was issued on 28 April 2006. The Service responded that—</p> <ul style="list-style-type: none"> • an expanded monitoring program such as that recommended by the Commission is beyond the scope of the proposed action; and • the incidental harassment authorization still requires that operations be suspended if a mortality or serious injury of a seal is detected.
10 April to Fish and Wildlife Service	<p>Regarding permit application no. PRT-113725 (Mark Clementz) to acquire, transport, and import sirenian biological samples from Australia and South America to study the feeding ecology of sirenians, the Commission recommended approval with provisions.</p>	<p>At the end of 2006, the permit had not yet been issued.</p>
10 April to Fish and Wildlife Service	<p>Regarding permit application no. PRT-119904 (Alaska Zoo) to import one captive-born male polar bear from SeaWorld Enterprises in Australia, the Commission recommended approval with provisions.</p>	<p>The permit was issued on 17 July 2006. The Commission’s recommended provisions were adopted.</p>

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
18 April to National Marine Fisheries Service	Regarding permit application no. 782-1812 (National Marine Mammal Laboratory), the Commission recommended approval with provisions. The applicant proposed taking California sea lions, harbor seals, northern elephant seals, and northern fur seals during capture, tagging, branding marking, anesthetizing, and sampling activities, and euthanizing premature and moribund pups.	The permit was issued on 9 May 2006. The Commission's recommended provisions were adopted.
24 April to National Marine Fisheries Service	Regarding a request by the National Marine Fisheries Service for comments on its initiation of a status review of the Cook Inlet beluga whale under the Endangered Species Act, the Commission reiterated the recommendation made in its 27 June 2005 letter commenting on the draft conservation plan for this stock that the Service proceed expeditiously to list the population under the Endangered Species Act. The Commission also recommended that the Service— <ul style="list-style-type: none"> • proceed directly to publish a proposed rule without waiting to complete a comprehensive status review and give serious consideration to using the emergency listing provisions available under section 4(b)(7) of that Act; and • propose to list "high value" habitats identified in the draft conservation plan as critical habitat as part of the recommended listing. 	The proposed rule had not been published at the end of 2006.
25 April to National Marine Fisheries Service	Regarding permit application no. 1093-1834-00 (Susan Shaw, Ph.D.), the Commission recommended approval with provisions. The application proposed capturing, measuring, and sampling up to 280 harbor seal pups to demonstrate the utility of the species as a mammalian sentinel species for coastal contamination and associated health risks for top consumers in the marine food chain.	The permit was issued on 12 June 2006. The Commission's recommended provisions were adopted.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
<p>27 April to Fish and Wildlife Service</p>	<p>Regarding proposed regulations to authorize the Alaska Oil and Gas Association to take by non-lethal means small numbers of polar bears and Pacific walrus incidental to year-round oil and gas operations in the Beaufort Sea and adjacent northern coast of Alaska, the Commission recommended that the Service—</p> <ul style="list-style-type: none"> • conduct a more comprehensive analysis of the association’s operations by considering the direct effect of these operations together with (1) other oil and gas activities that affect these populations, (2) other natural and anthropogenic risk factors (such as climate change), and (3) the cumulative effect of all these activities over time; • provide estimates of the annual and five-year probabilities of a large spill (i.e., greater than 1,000 barrels) for each individual project and from all projects combined to provide better insights into the likelihood of a spill resulting in mortality of polar bears or other marine mammals; • require that the regulations include a description of mitigation measures that will be established to minimize the impact on polar bears so that the public can evaluate the potential efficacy of those measures; • require that the regulations include a monitoring program specific to Alaska Oil and Gas Association operations that is capable of detecting when and how polar bears and walrus are taken and verifying that such takings have a negligible impact on the affected populations; • develop, along with other appropriate agencies and organizations, a broad-based population monitoring and impact assessment program to ensure that these activities, in combination with other risk factors, are not (1) individually or cumulatively having any population-level effects on polar bear or walrus populations or (2) adversely affecting the availability of these marine mammals for subsistence uses by Alaska Natives; and • ensure that the monitoring program initially focuses on the need to collect adequate baseline information to allow future analyses of effects, and that such baseline information should be collected before further oil and gas operations commence. 	<p>The final rule was published and became effective on 2 August 2006. The Service responded that—</p> <ul style="list-style-type: none"> • its analysis of oil and gas activities for the rulemaking encapsulates all the known oil and gas industry activities that will occur in the region during the five-year regulation period; • the final rule incorporates the Service’s five-year estimates for the probability of a large spill at two production sites as a representative analysis of the types of risks polar bears would encounter if a large spill occurred in the nearshore areas of the Beaufort Sea; • final regulations have been revised to specify those mitigation measures that will be required for all oil and gas activities and those that may be required, depending on the activities; • final regulations clarify the monitoring requirements for activity, but there is no requirement that monitoring associated with an incidental take be sufficient on its own to assess whether the associated take has a negligible impact on the species or stock; and • monitoring provisions associated with the final regulations were never intended as the sole means of determining whether the activities will have a negligible effect on polar bear or walrus populations, and the Service does not require industry to conduct such monitoring and associated research.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
28 April to Fish and Wildlife Service	Noting that the Fish and Wildlife Service has not updated its stock assessment reports for the California and Washington stocks of sea otters since 1995, the Commission recommended that the Service take immediate action to revise the reports, make them available for public review, and publish them as required by sections 118(a), 118(b)(1), and 118(b)(3) of the Marine Mammal Protection Act.	On 4 August 2006 the Service responded that it had submitted revised draft stock assessment reports for the California and Washington sea otter stocks at the January 2005 meeting of the Pacific Scientific Review Group, and that it plans to revise the drafts based on the comments of the group and to present revised draft reports at the next Pacific Scientific Review Group meeting, after which the draft reports will be provided for public comment.
5 May to Fish and Wildlife Service	Regarding the request for amendment of permit no. PRT-054026 (Hubbs–Sea World Research Institute), the Commission recommended approval with provisions. The request proposed to conduct additional acoustic reflectivity measurements on captive manatees to determine the feasibility of detecting the animals using sonar at ranges useful for preventing manatee/boat interactions.	
15 May to National Marine Fisheries Service	<p>Commending the National Marine Fisheries Service for implementing emergency rules that prohibited gillnet fishing in right whale calving areas off Jacksonville Beach, Florida, after the death of a right whale calf was determined to be the result of entanglement in a gillnet. The Commission recommended that to further protect right whale mother/calf pairs in the calving area and along the southern portion of the whales' migratory route, the Service—</p> <ul style="list-style-type: none"> • promulgate a permanent rule that prohibits all gillnet fishing in the southeast U.S. restricted area from 15 November through 15 April, with an exception for mackerel and shark gillnet fishing south of 29° N latitude; and • promulgate a permanent rule that extends the southeast U.S. restricted area to include waters within 40 miles of shore off northern Georgia and South Carolina and that prohibits all gillnet fishing in this extension from 1 November through 30 April unless and until gear modifications or fishing practices are identified that would ensure that no right whales would be entangled. 	On 1 June 2006 the Service responded that it would consider the Commission's recommendations to permanently prohibit all gillnet fishing in the southeast U.S. restricted area from 15 November to 15 April each year, except for mackerel and shark gillnetting south of 29° N latitude; and permanently extend the restricted area to include waters within 40 miles of shore off northern Georgia and South Carolina, such that all gillnet fishing is prohibited in the area from 1 November to 30 April each year. The Service stated that it will consider the recommendations made by the Atlantic Large Whale Take Reduction Team subgroup and the Commission when developing proposed rulemaking to address interactions between right whales and gillnet fishing in the southeast U.S. restricted area.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
<p>22 May to National Marine Fisheries Service</p>	<p>Regarding proposed regulations to authorize the Minerals Management Service to take up to 28 species of cetaceans incidental to the removal of oil and gas drilling and production structures in the Gulf of Mexico, the Commission recommended that—</p> <ul style="list-style-type: none"> • the Service encourage the Minerals Management Service, in cooperation with industry and acoustic consultants, to continue to collect in situ data from explosive severance activities for comparison with and verification of model predictions of the impacts of explosive severance activities; • before implementing the proposed regulations, the National Marine Fisheries Service evaluate the potential for cumulative indirect effects that could result from the disturbance of hazardous substances that accumulate around production platforms; and • before implementing the proposed regulations, the Service clarify the apparent discrepancies between the numbers and species of animals requested by the applicant to be taken by Level A and Level B harassment versus the numbers and species proposed to be authorized by the Service in its proposed rule. 	

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23 May to National Marine Fisheries Service	<p>Regarding the National Marine Fisheries Service's proposed rule for the 2006 List of Fisheries under the Marine Mammal Protection Act, the Commission commended the Service for providing a more detailed description of the basis for classification decisions; initiating an observer program for the American Samoa longline fishery; conducting research to determine the distribution and stock structure of short- and long-finned pilot whales, estimate the abundance of each species, and identify which species is taken incidental to commercial fisheries; and its intention to convene a take reduction team for Atlantic trawl fisheries. The Commission recommended that the Service—</p> <ul style="list-style-type: none"> • describe the level of observer coverage for each fishery in the List of Fisheries; • review all cases where serious injury or mortality has occurred but either the involved fishery or the affected stock, or both, is not known to determine if potential misallocation of take could result in misclassification of the potentially involved fisheries, and, if such misclassifications are possible, develop alternatives for classifying the fishery or fisheries that ensure that potential risks to affected marine mammal stocks, particularly those that may be more vulnerable to fishery interactions, are evaluated in a precautionary manner; • take the reasonable and precautionary step of reclassifying as Category I the gillnet fisheries in the southeast Atlantic, which may have caused the January 2006 death of a North Atlantic right whale calf, to assess fully their level of interaction with marine mammals; • undertake a more complete investigation of interactions between marine mammals and the western Pacific squid jig fishery and reclassify the fishery if warranted; • monitor aquaculture operations to characterize the rate of interactions with marine mammals and take the necessary steps to prevent, minimize, or mitigate potential impacts on marine mammals and the affected ecosystems; • expedite its investigation of bottlenose dolphin stock structure in the Gulf of Mexico and reevaluate the blue crab trap/pot fishery, menhaden purse seine fishery, and other Gulf of Mexico fisheries whose classification may be affected by new information on bottlenose dolphin stock structure; and • compare the distributions of the southeast Atlantic inshore gillnet fishery and marine mammals in the same region, particularly bottlenose dolphins, and reclassify the fishery as Category II if those distributions overlap to an appreciable degree. 	<p>The final rule for the 2006 List of Fisheries was published on 22 August. In response to the Commission's recommendations, the Service stated that—</p> <ul style="list-style-type: none"> • detailed information on the level or percentage of observer coverage in the List of Fisheries was not provided because it is generally of limited use without information on the confidence associated with mortality/serious injury estimates generated from observer data; • most often, the Service has enough information from fisheries in the area to gauge potential for certain gear to be a risk to marine mammals and it uses this information to classify fisheries by analogy to other fisheries with similar gear in Category II. The Service may also place observers in these fisheries to gather data for which there is not yet sufficient information to determine the level of serious injury and mortality in a given fishery and/or which stocks interact with the fishery, and if misclassification of a fishery were to occur, it is more likely to err on the conservative side as to minimize potential risks to marine mammals. The Service would then evaluate spatial and temporal cues to discern overlap between stranding reports and fishing activity, as well as net or gear marks or any other evidence that might indicate fishery interactions. The Service would use this information in determining which fisheries might be involved. • it has not determined which specific gillnet fishery (i.e., the Southeast Atlantic gillnet fishery or the Southeastern U.S. Atlantic shark gillnet fishery) was responsible for the death of a right whale calf in the Southeast U.S. Restricted Area. Therefore, elevation of the Southeast Atlantic gillnet fisheries to Category I is not warranted at this time; • there are no documented marine mammal serious injuries or mortalities incidental to the Western Pacific squid jig fishery, which has only six participants, and the Service will consider reclassification options for this fishery as future information warrants; • its research in the Gulf of Mexico in 2005–2006, as well as future planned research in the area, will assist in a further understanding of bottlenose dolphin stock structure in the Gulf of Mexico, and the Service will consider these research results in analysis for future List of Fisheries; • it will continue to monitor fishing efforts and evaluate bottlenose dolphin strandings for evidence of gillnet-related fishery interactions in and around inshore waters of the Southeast to determine the need for future reclassification of the fishery.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
<p>24 May to National Marine Fisheries Service</p>	<p>Regarding the request by the U.S. Navy to take small numbers of marine mammals by harassment incidental to conducting Rim of the Pacific (RIMPAC) antisubmarine warfare (ASW) training exercises in waters around the Hawaiian Islands, the Commission recommended that—</p> <ul style="list-style-type: none"> • the Service clarify that it cannot use section 101(a)(5) of the Marine Mammal Protection Act to authorize the taking of marine mammals by non-U.S. citizens or vessels, some of which are expected to participate in the proposed military exercises; • the Service consult with the U.S. Navy to overcome this shortcoming by modifying the proposed activities or seeking an alternative authorization for such taking; • in light of the uncertainties concerning the potential adverse effects of mid-frequency sonar on beaked whales and other deep-diving species and the potential for serious injury or mortality of these species, the Service reconsider its decision to authorize the proposed activity by means of an incidental harassment authorization and instead promulgate regulations to govern the incidental taking under section 101(a)(5)(A) of the Marine Mammal Protection Act; • if the Service chooses to proceed with issuance of the requested incidental harassment authorization despite these problems, it require that the applicant take the following steps: increase to at least 45 minutes the monitoring period for determining whether a marine mammal is within or about to enter the prescribed safety zones to account for deep-diving species that can remain submerged for longer than 30 minutes; as a precautionary measure, “power down” sonar sources by 6 dB at night and during all other times of low-visibility conditions and during all choke-point exercises; and suspend operations immediately if a dead or seriously injured marine mammal is found in the vicinity of the operations that possibly could be attributed to the Navy’s activities, pending authorization to proceed or issuance of regulations authorizing such takes under section 101(a)(5)(A) of the Act; and • the Service revise its interpretation of temporary threshold shift to indicate that it has the potential to injure marine mammals and therefore constitutes Level A harassment due to foreseeable secondary effects of temporary hearing loss. 	<p>The incidental harassment authorization was issued on 29 June 2006. In response to the Commission’s comments, the Service stated that—</p> <ul style="list-style-type: none"> • the Navy has indicated that all foreign vessels participating in RIMPAC 2006 will be under the operational control of Commander, U.S. Third Fleet in his capacity as the officer conducting the exercises and Commander, Combined Task Force RIMPAC; • because of the fast-moving nature of the exercise, increasing the monitoring period to 45 minutes was not feasible; • the incidental harassment authorization requires the Navy to power down sonar by 6 dB if it cannot detect marine mammals out to the prescribed safety zone and in strong surface-ducting conditions; • the incidental harassment authorization includes specific shutdown criteria, which require the Navy to temporarily cease operating sonar in a designated area when a stranding is verified during the RIMPAC ASW exercise. The Service will then conduct an investigation, and if the Service finds that the Navy’s activities may have contributed to the stranding, the Service will modify, revoke, or suspend the incidental harassment authorization; and • temporary threshold shift (TTS) may be considered to be an adaptive process wherein sensory cells change their response patterns to sound. Tissues are not irreparably damaged with the onset of TTS, the effects are temporary, and the Service does not believe that this effect qualifies as an injury.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
5 June to National Marine Fisheries Service	<p>Regarding the requests by Shell Offshore, Inc., and its geophysical [seismic] contractor, WesternGeco, Inc.; Conoco Phillips Alaska, Inc.; and GX Technology to take small numbers of marine mammals by harassment incidental to conducting seismic surveys during the open-water season in the Chukchi Sea, the Commission recommended that—</p> <ul style="list-style-type: none"> • the Service conduct a more comprehensive analysis of the applicants' proposed operations by considering the direct effects of these operations in conjunction with (1) other currently authorized and proposed oil and gas activities that may affect marine mammal populations, (2) other natural and anthropogenic risk factors (e.g., climate change), and (3) the cumulative effect of all likely oil and gas activities and other risk factors over time; • in cooperation with the applicant and other appropriate agencies and organizations, the Service develop a broad-based population monitoring and impact assessment program to ensure that these activities, in combination with other risk factors, are not (1) individually or cumulatively having any population-level effects on marine mammals, or (2) adversely affecting the availability of marine mammals for subsistence uses by Alaska Natives; • the Service require that the monitoring program mandated under the Marine Mammal Protection Act initially focus on the need to collect adequate baseline information to allow for future analyses of effects; and if the Service chooses to proceed with issuance of the requested incidental harassment authorizations absent a more comprehensive analysis of the applicants' proposed operations, to do the following: require all practicable monitoring and mitigation measures to afford bowhead whales and other marine mammal species adequate protection from sources of behavioral disturbance; • revise its interpretation of temporary threshold shift to indicate that it has the potential to injure marine mammals and therefore constitutes Level A harassment due to foreseeable secondary effects of temporary hearing loss; and • require that operations be suspended immediately if a dead or seriously injured marine mammal is found in the vicinity of the operations and the death or injury could be attributable to the applicants' activities. The Commission recommended that any suspension should remain in place until the Service has (1) reviewed the situation and determined that further deaths or serious injuries are unlikely to occur or (2) issued regulations authorizing such takes under section 101(a)(5)(A) of the Marine Mammal Protection Act. 	<p>The incidental harassment authorizations were issued to Conoco Phillips on 7 July 2006, to Shell Offshore on 18 August 2006, and to GX Technology on 15 August 2006. In response to the Commission's recommendations, the Service stated that—</p> <ul style="list-style-type: none"> • the National Marine Fisheries Service adopted the final Programmatic Environmental Assessment prepared by the Minerals Management Service for these actions. That document adequately addresses potential cumulative impacts of industry and other natural and anthropogenic risk factors; • the Commission's argument for considering temporary threshold shift as both Level A harassment and Level B harassment is based on conjecture on what might occur if a marine mammal with compromised hearing was at a disadvantage for survival. It is likely that marine mammals evolved certain behavioral responses to address natural loud noises in the environment by changes in non-specific spatial separation; and • the Service did not adopt the Commission's recommendations concerning the development of a broad-based population monitoring and impact assessment program.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
7 June to National Ocean Service	Regarding proposed lobster research in the Northwestern Hawaiian Islands to investigate the long-term metapopulation dynamics of several lobster species in the region, the Commission endorsed the project. The Commission noted that correlating results of lobster research with those of the monk seal program may provide useful insights into cause-and-effect relationships associated with changes in endangered monk seal populations on particular atolls. The Commission noted that it appreciated the careful manner in which the National Ocean Service is managing the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve.	

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7 June to Fish and Wildlife Service	<p>Regarding the requests by Shell Offshore, Inc. and its geophysical [seismic] contractor, WesternGeco, Inc.; Conoco Phillips Alaska, Inc.; and GX Technology to take small numbers of marine mammals by harassment incidental to conducting seismic surveys during the open-water season in the Chukchi Sea, the Commission recommended that the Service—</p> <ul style="list-style-type: none"> • conduct a more comprehensive analysis of the applicants' proposed operations by considering the direct effects of these operations in conjunction with (1) other currently authorized and proposed oil and gas activities that may affect walrus or polar bear populations, (2) other natural and anthropogenic risk factors (e.g., climate change), and (3) the cumulative effect of all likely oil and gas activities and other risk factors over time; • in cooperation with the applicant and other appropriate agencies and organizations, develop a broad-based population monitoring and impact assessment program to ensure that these activities, in combination with other risk factors, are not individually or cumulatively having more than negligible population-level effects on walruses or polar bears or unmitigable adverse effects on the availability of these species for subsistence uses by Alaska Natives; • require that the monitoring program mandated under the Marine Mammal Protection Act initially focus on the need to collect adequate baseline information to allow for future analyses of effects; and • if it chooses to proceed with issuance of the requested incidental harassment authorizations absent a more comprehensive analysis of the applicants' proposed operations, to do the following: require all practicable monitoring and mitigation measures to afford walruses and polar bears adequate protection from sources of behavioral disturbance; and • require that operations be suspended immediately if a dead or seriously injured walrus or polar bear is found in the vicinity of the operations and the death or injury could be attributable to the applicants' activities. The Commission recommended that any suspension should remain in place until the Service has (1) reviewed the situation and determined that further deaths or serious injuries are unlikely to occur or (2) issued regulations authorizing such takes under section 101(a)(5)(A) of the Marine Mammal Protection Act. 	

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
<p>16 June to National Marine Fisheries Service</p>	<p>Regarding the request from the University of Texas at Austin Institute for Geophysics to take small numbers of marine mammals by harassment incidental to conducting a marine seismic survey in the Arctic Ocean, the Commission recommended that the Service—</p> <ul style="list-style-type: none"> • require the applicant to conduct all practicable monitoring and mitigation measures to afford the potentially affected marine mammal species adequate protection from sources of disturbance, including behavioral disturbance; • revise its interpretation of temporary threshold shift (TTS) to indicate that it has the potential to injure marine mammals and therefore constitutes Level A harassment due to foreseeable secondary effects of temporary hearing loss; • require that operations be suspended immediately if a dead or seriously injured marine mammal is found in the vicinity of the operations and the death or injury could be attributable to the applicant’s activities, and that any suspension should remain in place until the Service has (1) reviewed the situation and determined that further deaths or serious injuries are unlikely to occur, or (2) issued regulations authorizing such takes under section 101(a)(5)(A) of the Marine Mammal Protection Act; • conduct a more comprehensive analysis of the applicant’s proposed activities by considering the direct effects of these operations in conjunction with (1) other seismic surveys proposed to be conducted in the Beaufort and Chukchi Seas during the 2006 open-water period, (2) currently authorized and proposed oil and gas activities that may affect marine mammal populations in these areas, (3) other natural and anthropogenic risk factors (e.g., climate change), and (4) the cumulative effect of all of these activities and other risk factors over time; • cooperate with the applicant and other appropriate agencies and organizations to develop a broad-based population monitoring and impact assessment program to ensure that these activities, in combination with other risk factors, are not individually or cumulatively having any population-level effects on marine mammals or adversely affecting the availability of marine mammals for subsistence use by Alaska Natives; and • initially focus the monitoring program on the need to collect adequate baseline information to allow for future analyses of effects. 	<p>The incidental harassment authorization was issued on 26 July 2006. In response to the Commission’s recommendations, the Service stated that—</p> <ul style="list-style-type: none"> • it believes that the incidental harassment authorization includes the monitoring and mitigation measures necessary to ensure the least practicable adverse impact to marine mammals. The Service states that both it and the National Science Foundation believe that the collection of baseline marine mammal data in the Arctic is an important goal, but that the cost in both money and manpower of implementing an effective passive acoustic program is not practicable for this activity; • it considers TTS to be an adaptive process wherein sensory cells change their response patterns to sound. Tissues are not irreparably damaged with the onset of TTS, the effects are temporary, and the Service does not believe that this effect qualifies as an injury; • it will incorporate the Commission’s recommendation regarding suspension of operations in the incidental harassment authorization; and • both the Service and the National Science Foundation recognize the importance of long-term monitoring in the Arctic and will work towards this end whenever possible. However, sections 101(a)(5)(A) and (D) of the Marine Mammal Protection Act do not address cumulative effects and therefore it is not appropriate to require the applicant, through the incidental harassment authorization, to participate in a long-term monitoring program.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
20 June to National Marine Fisheries Service	Regarding application no. 763-1845-00 (Olav Oftedal, Ph.D.), the Commission recommended approval with provisions. The application proposed capturing, tagging, and releasing up to 260 Weddell seals annually and harassing up to an additional 40 Weddell seals incidental to the research activities annually over two field seasons in McMurdo Sound, Antarctica, to study the species' natural history.	The permit was issued on 8 September 2006. The Commission's recommended provisions were adopted.
7 July to National Marine Fisheries Service	Regarding permit application no. 116-1843-00 (Sea World, Inc.), the Commission recommended approval with provisions. The application proposed to import three male beluga whales from Marineland of Canada in Ontario to SeaWorld in Orlando for purposes of public display.	The permit was issued on 14 November 2006. The Commission's recommended provisions were adopted.
7 July to Fish and Wildlife Service	Regarding the request for renewal of permit no. PRT-038448 (Iskande Larkin, Ph.D.), for the purpose of studying the reproductive endocrine health of manatees, the Commission recommended approval with provisions. The request sought renewal of the permit for an additional five years and authorization of research involving five free-ranging female manatees accompanied by calves and 14 captive manatees.	The permit had not been issued at the end of 2006.
11 July to Fish and Wildlife Service	Regarding the request to amend permit no. MA081663-0 (Howard C. Rosenbaum, Ph.D.), for genetic studies on marine mammals, the Commission recommended approval with provisions. The request proposed amendment of the permit to authorize the importation of shed polar bear hair and feces salvaged in Canada and previously collected and accessioned DNA and tissue samples from tissue banks or collaborators.	The permit was issued on 21 September 2006. The Commission's recommended provisions were adopted.
13 July to National Marine Fisheries Service	Regarding the request from FEX L.P., to take small numbers of marine mammals incidental to activities related to towing barges from West Dock Causeway in Prudhoe Bay, Alaska, to Cape Simpson or Point Lonely in the U.S. Beaufort Sea, the Commission recommended that— <ul style="list-style-type: none"> • all reasonable measures be taken to ensure the least practicable impact on the subject species; and • the required mitigation and monitoring activities (i.e., the use of Native advisors, the comprehensive training of all marine mammal observers, and on-board monitoring throughout the transit operations) are carried out as described in the Service's 13 June 2006 <i>Federal Register</i> notice and the application. 	The incidental harassment authorization was issued on 28 July 2006. The Commission's recommendations were adopted.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
<p>20 July to National Marine Fisheries Service</p>	<p>Regarding the request from URS Corporation to take small numbers of marine mammals incidental to conducting geophysical surveys in the southern San Francisco Bay, California, the Commission recommended that the Service—</p> <ul style="list-style-type: none"> • determine whether the proposed pre-survey and post-survey monitoring are of sufficient duration and extent to yield meaningful results; • specify the minimum approach distances around Newark Slough and Plummer Creek during the harbor seal pupping season to ensure that seals are not disturbed at those sites; • require that the applicant inform stranding network participants of the dates of the proposed activities to alert them that any animals that strand around those dates should be examined for signs of acoustic trauma; and • specify that survey activities be suspended immediately if a dead or seriously injured marine mammal is found in the vicinity of the operations and the death or injury could have occurred incidental to the proposed activities. 	<p>The incidental harassment authorization was issued on 25 September 2006. In response to the Commission’s recommendations, the Service stated that—</p> <ul style="list-style-type: none"> • because the proposed operation is small in scale, will occur in a limited area for eight to ten days, and the potential impacts on marine mammals, if any, are expected to be minimal, the Service believes that the proposed pre-survey and post-survey monitoring are of sufficient duration and extent; • notifying the stranding network participants of the dates of the proposed activities is not warranted because no injury or mortality of marine mammals is expected; and • the incidental harassment authorization requires immediate suspension of activities if it is believed that they may have resulted in the death or serious injury of a marine mammal.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
<p>24 July to National Marine Fisheries Service</p>	<p>Regarding the request from the U.S. Air Force to take by harassment small numbers of Atlantic bottlenose dolphins and Atlantic spotted dolphins incidental to explosive testing of obstacle and mine clearance systems off Santa Rosa Island in the Gulf of Mexico, the Commission recommended that the Service—</p> <ul style="list-style-type: none"> • assess the likelihood of detecting marine mammals at or below the water surface within zones of potential impacts, particularly when operations are conducted at night; • require that operations be suspended immediately if a dead or seriously injured marine mammal is found in the vicinity of the operations and the death or injury could have occurred incidental to the proposed activities; • revise its interpretation of temporary threshold shift to indicate that it has the potential to injure marine mammals (and, in the case of military readiness activities, has a significant potential to injure marine mammals) and therefore constitutes Level A harassment due to the foreseeable secondary effects of temporary hearing loss; and • advise the Air Force, if it has not already done so, to consult with the Fish and Wildlife Service to confirm that manatees are not likely to occur in or near the vicinity of the test site at the time the tests are scheduled to be conducted. 	<p>The incidental harassment authorization was issued on 18 December 2006.</p>

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
<p>24 July to Fish and Wildlife Service</p>	<p>Regarding the request from the University of Texas at Austin Institute for Geophysics to take by harassment small numbers of walrus and polar bears incidental to conducting a marine seismic survey of the Arctic Ocean, including the Chukchi Sea, the Commission recommended that the Service—</p> <ul style="list-style-type: none"> • require the applicant to conduct all practicable monitoring and mitigation measures to afford the potentially affected marine mammal species adequate protection from disturbance; • require that operations be suspended immediately if a dead or seriously injured marine mammal is found in the vicinity of the operations and the death or injury could be attributable to the applicant's activities, and any suspension should remain in place until the Service (1) has reviewed the situation and determined that further deaths or serious injuries are unlikely to occur or (2) has issued regulations authorizing such takes under section 101(a)(5)(A) of the Marine Mammal Protection Act; • conduct a more comprehensive analysis of the applicant's proposed activities by considering the direct effects of those operations in conjunction with (1) other seismic surveys proposed to be conducted in the Chukchi Sea during the 2006 open-water season, (2) currently authorized and proposed oil and gas activities that may affect marine mammal populations in the area, (3) other natural and anthropogenic risk factors (e.g., climate change), and (4) the cumulative effect of all of those activities and other risk factors over time; • cooperate with the applicant and other appropriate agencies and organizations to develop a broad-based population monitoring and impact assessment program to ensure that these activities, in combination with other risk factors, are not individually or cumulatively having any population-level effects on marine mammals or adversely affecting the availability of marine mammals for subsistence uses by Alaska Natives; and • initially focus the monitoring program on the need to collect adequate baseline information to allow for future analyses of effects. 	

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
26 July to National Marine Fisheries Service	Regarding permit application 774-1847-00 (Southwest Fisheries Science Center), the Commission recommended approval with provisions. The application proposed to capture, handle, tag, and release up to 710 Antarctic fur seals and 20 leopard seals annually for five years at Cape Shirreff, South Shetland Islands, Antarctica, to study the life history, abundance, and distribution of Antarctic pinniped species in the South Shetland Islands.	The permit was issued on 5 September 2006. The Commission's recommended provisions were adopted.
3 August to National Marine Fisheries Service	Regarding a request to amend permit no. 1070-1783 (Alejandro Acevedo-Gutierrez) for the purpose of studying how marine predators respond to increased prey density and the impact on marine protected areas, the Commission recommended approval with provisions. The request proposed amendment of the permit to increase the number of harbor seals authorized to be harassed during aerial and vessel surveys and scat collections throughout the San Juan Islands archipelago.	The permit was issued on 5 September 2006. The Commission's recommended provisions were adopted.
3 August to National Marine Fisheries Service	Regarding the request from the Army Corps of Engineers, Jacksonville District, to modify its authorization to take small numbers of bottlenose dolphins incidental to expanding and deepening the Port Sutton navigation channel in Tampa Harbor, Florida, the Commission recommended approval with conditions.	
10 August to National Marine Fisheries Service	Regarding permit application no. 1053-1825 (David Mann, Ph.D.), 1079-1828 (Peter Scheifele, Ph.D.), and 1095-1837 (Dorian Houser, Ph.D.), the Commission recommended approval with provisions. The applicants proposed to conduct hearing measurements on several species of stranded or rehabilitating marine mammals to assess the potential impacts of anthropogenic noise.	The permit to David Mann, Ph.D., was issued on 22 November 2006. Permits to Peter Scheifele, Ph.D. and Dorian Houser, Ph.D. had not been issued at the end of 2006.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
<p>14 August to National Marine Fisheries Service</p>	<p>Regarding the Service's <i>Federal Register</i> notice describing proposed critical habitat for the southern resident killer whale stock, the Commission recommended that the Service establish critical habitat for the stock as described in the notice. The Commission also recommended that the Service—</p> <ul style="list-style-type: none"> • recognize natural sound characteristics as an essential feature or primary constituent element of southern resident killer whale critical habitat; • investigate all potential connections between sources of sound disturbance and actions authorized, funded, or carried out by the federal government to determine if a nexus exists, thereby allowing the Service to avail itself of all conservation tools under the Endangered Species Act, particularly section 7 consultations; • implement a precautionary approach with regard to management of contaminants to prevent them from entering the Puget Sound environment; • designate critical habitat for the southern resident killer whale stock up to the shoreline, rather than limit it to waters more than 20 feet deep; and • initiate its investigation of winter habitat use by southern resident killer whales as soon as possible. 	<p>The final rule was published on 29 November 2006 and became effective on 29 December 2006. The Service noted that—</p> <ul style="list-style-type: none"> • at this time, there is insufficient information to include sound as a primary constituent element of killer whale critical habitat, and the Service will continue to consider sound in any future revisions of the critical habitat designation; • the Service has provided a list of activities that may be affected by the designation, including, but not limited to, fishery management practices, vessel traffic, dredging and disposal, submarine cable/pipeline installation and repair, oil and gas exploration, pollutant discharge, and oil spill prevention and response and will work with the Coast Guard and other agencies that oversee vessel activities to explore actions regarding vessels that may require section 7 consultation under the Endangered Species Act; • the Service will consider the comments pertaining to specific threats to the whales and their habitat and potential management actions in developing a recovery plan for southern resident killer whales; and • at this time, there is insufficient information to determine that the currently occupied habitat is inadequate and that additional unoccupied habitat in the shallow areas less than 20 feet deep is essential for conservation of the species.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
15 August to National Marine Fisheries Service	<p>Regarding the Service's proposed rule to limit vessel speeds to 10 knots in certain areas to reduce collisions between ships and North Atlantic right whales, the Commission commended the Service for developing and proposing these measures. The Commission recommended that—</p> <ul style="list-style-type: none"> • the Service adopt the proposed measures, including a 10-knot speed limit in areas where ship speeds are to be restricted, the boundaries identified for all of the proposed management areas, and the identified time frames for seasonal speed restrictions in management areas; • the type of vessels to be regulated be adopted as proposed for all areas except the proposed southeast management areas off Florida and Georgia, and for the southeast management areas only, the Service modify its proposed rules to make them applicable to all motorized vessels 40 feet or longer; and • the designation of dynamic management areas be made effective immediately after a single observation of right whale densities satisfying the proposed criterion and immediately upon the first Coast Guard broadcast to mariners identifying the boundaries of the area. 	The final rule had not been published at the end of 2006.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
<p>21 August to National Marine Fisheries Service</p>	<p>Regarding the request from Eglin Air Force Base to take small numbers of marine mammals incidental to Naval Explosive Ordnance Disposal School training operations in the northern Gulf of Mexico, the Commission referred the Service to its 8 July 2005 letter commenting on the applicant's earlier request. In that letter, the Commission recommended that if the Service determines that the potential for lethal injuries is sufficiently remote to warrant the issuance of an authorization under section 101(a)(5)(D) of the Marine Mammal Protection Act, any such authorization explicitly require that operations be suspended immediately if a dead or seriously injured animal is found in the vicinity of the test site, pending authorization to proceed or issuance of regulations authorizing such takes under section 101(a)(5)(A) of the Act. The Commission reiterated its belief that the Service's across-the-board definition of temporary threshold shift (TTS) as constituting no more than Level B harassment inappropriately dismisses possible injury and biologically significant behavioral effects to the affected animals; and, prior to issuing the requested authorization, the Service should provide a better explanation of and justification for using (1) the dual criteria established for determining non-lethal injury, the "non-injurious behavioral response" threshold, and (2) the 23 psi criterion for estimating TTS threshold.</p>	<p>The incidental harassment authorization was issued on 5 October 2006. In response to the Commission's recommendations, the Service stated that—</p> <ul style="list-style-type: none"> • the incidental harassment authorization requires immediate suspension of activities if it is believed that they may have resulted in the death or serious injury of a marine mammal; and • the Commission's recommendations concerning TTS and the need for further explanation of and justification for use of the dual criteria and the 23 psi criterion are addressed in the <i>Federal Register</i> notice announcing the issuance of Eglin's 2005 incidental harassment authorization for training operations in the northern Gulf of Mexico.
<p>25 August to National Marine Fisheries Service</p>	<p>Regarding application no. 1100-1849-00 (Shane Moore), the Commission recommended approval of the requested permit. The application proposed taking by Level B harassment up to 10 killer whales from the eastern North Pacific transient stock, 10 gray whales, and 10 minke whales annually for three years by close approach during filming to document the behavior of marine mammals in the presence of the carcass of a gray or minke whale killed by killer whales.</p>	<p>The permit had not been issued at the end of 2006.</p>
<p>25 August to National Marine Fisheries Service</p>	<p>Regarding application no. 1034-1854-00 (Marcus Horning, Ph.D.), the Commission recommended approval with provisions. The application proposed capturing and conducting research on up to 48 adult and juvenile Weddell seals in McMurdo Sound, Antarctica, and incidentally harassing up to 250 Weddell seals during the research activities over two years to investigate physiological limitations associated with aging and the significance of those changes to pin-niped behavior and ecology.</p>	<p>The permit was issued on 19 September 2006. The Commission's recommended provisions were adopted.</p>

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
25 August to Fish and Wildlife Service	Regarding application PRT-118442 (Lance G. Barrett-Lennard, Ph.D.), the Commission recommended that, prior to issuing the permit, the Service obtain additional information from the applicant for review by the Service and the Commission. The application proposed to harass northern sea otters in Alaska waters during 2006 and 2007 to study the vigilance behavior of the animals in response to killer whales.	The permit had not been issued at the end of 2006.
31 August to National Marine Fisheries Service	<p>Regarding requests from Eglin Air Force Base to take marine mammals incidental to taking small numbers of several species of cetaceans in the Gulf of Mexico incidental to (1) precision strike weapons testing and training, and (2) Naval Explosive Ordnance Disposal School training operations, the Commission recommended that the Service grant the requested authorizations provided that—</p> <ul style="list-style-type: none"> • the applicant be required to conduct all practicable monitoring and mitigation measures to afford the potentially affected marine mammal species adequate protection from serious and lethal injury; • the Service require that training operations be suspended immediately if a seriously injured or dead marine mammal is found in the vicinity of the operations and the death or injury could be attributable to the applicant's activities, pending authorization to proceed or issuance of regulations authorizing such takes under section 101(a)(5)(A) of the Marine Mammal Protection Act; and • the Service cooperate with the applicant to develop a long-term strategy to monitor the abundance and distribution of marine mammals in the subject activity area to ensure that the proposed activities are not having any population-level effects on marine mammals over the five years that the regulations are in effect. 	<p>The final rule was published on 24 November 2006 and became effective on 26 December 2006. In response to the Commission's recommendations, the Service stated that—</p> <ul style="list-style-type: none"> • the monitoring effort for the proposed operations is similar to that used in previous ship-shock actions wherein detonations of 10,000 lbs were used without any serious injury or mortality of marine mammals being detected during extensive follow-up monitoring; • the Service and Eglin would be pleased to discuss a long-term monitoring strategy with the Commission; however, it is unclear whether a monitoring program could be designed that would be able to make a determination that the injury of approximately six dolphins and an additional 480 that may be harassed by all Eglin Air Force Base activities was having population-level impacts. Also, the Service noted that undertaking such studies is the responsibility of the National Marine Fisheries Service and other agencies and not the responsibility of holders of Letters of Authorization.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
31 August to National Marine Fisheries Service	<p>Regarding the Service’s request for comments on its draft revised Steller Sea Lion Recovery Plan, the Commission recommended that the Service—</p> <ul style="list-style-type: none"> • use the population viability analysis (PVA) developed through collaboration of a team committee with a contracting analyst as a basis for establishing recovery criteria; • implement a rigorous experimental research program that employs a genuine adaptive habitat, including not only short-term effects arising from the spatial and temporal distribution of fishing effort but also the long-term effects arising from catch levels based on a maximum sustainable yield (MSY) paradigm; and • establish an interagency, interdisciplinary team to implement and coordinate the research needed to guide recovery efforts, including the experimental program to assess fishery effects. 	The Service was working on the draft revised plan at the end of 2006.
31 August to National Marine Fisheries Service	Regarding the Service’s draft recovery plans for fin whales and sperm whales, the Commission recommended that the Service adopt both draft recovery plans, with several modifications.	No response had been received from the Service at the end of 2006.
5 September to National Marine Fisheries Service	Regarding application no. 87-1851-00 from Daniel P. Costa, Ph.D., the Commission recommended approval with provisions. The application proposed (1) studying the foraging ecology of Southern Ocean seals to determine the relationship of specific foraging behaviors and animal movement patterns to oceanographic and bathymetric features; and (2) investigate the foraging and diving behavior and energetics, timing and location of foraging, food habits, and at-sea distribution of California sea lions along the California coast to estimate the impact of those behaviors on listed stocks of salmonids, other protected fish species, and commercially important fish species.	The permit had not been issued at the end of 2006.
8 September to National Marine Fisheries Service	Regarding application no. 1097-1859-00 from Coral World (V.I.), Inc., the Commission recommended approval with provisions. The application proposed importing four male South American sea lions from Thailand for public display.	The permit was issued on 20 October 2006. The Commission’s recommended provisions were adopted.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
19 September to National Science Foundation	Regarding two applications (Olav Oftedal and Marcus Horning) received by the Office of Polar Programs under the Antarctic Conservation Act of 1978, the Commission noted that in both cases the investigators previously sought research permits to conduct research on Antarctic pinnipeds from the National Marine Fisheries Service pursuant to the Marine Mammal Protection Act. The Commission forwarded copies of its recommendations on those applications to the National Science Foundation.	The permit had not been issued at the end of 2006.
22 September to National Marine Fisheries Service	<p>Regarding the request from the Knik Arm Bridge and Toll Authority to take small numbers of beluga whales, harbor seals, Steller sea lions, harbor porpoises, and killer whales incidental to construction of the Knik Arm Bridge in Alaska over five years, the Commission recommended that—</p> <ul style="list-style-type: none"> • a rulemaking to issue the requested authorization be deferred until such time as the Service can, with reasonable confidence, support a conclusion that the proposed activities would have no more than a negligible impact on the Cook Inlet beluga whale population, which is continuing its unexpected and unexplained decline; • if the Service nevertheless decides to issue proposed regulations to authorize taking incidental to bridge construction based on the submitted application, the Service should provide more detailed information on (1) beluga whale habitat-use patterns in the project area and Upper Cook Inlet, (2) the cause or causes of the continuing decline of the beluga population, and (3) the likely impacts of the proposed activities on the beluga population, particularly in conjunction with other ongoing or planned activities in Upper Cook Inlet; and • in either case, before issuing regulations, the Service should provide specific evidence that the proposed monitoring program will be effective in detecting beluga whales in or approaching the project area and that the proposed mitigation measures will be effective in preventing injury to the whales. 	A proposed rule was not published at the end of 2006.
27 September to National Marine Fisheries Service	Regarding application no. 493-1848-00 (Darlene R. Ketten, Ph.D.), the Commission recommended approval with provisions. The application proposed to acquire, import, and export specimen material from all species of cetaceans, pinnipeds, sirenians, and sea otters that strand and die (or are euthanized) or that die in captivity of natural causes to investigate how structural elements of marine mammal ears contribute to underwater hearing.	The permit had not been issued at the end of 2006.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
28 September to National Marine Fisheries Service	Regarding measures to prevent additional gillnet-related deaths of Atlantic right whales in the Southeast U.S. Restricted Area, the Commission recommended that the Service immediately publish emergency rules to either (a) extend the closure adopted in the 16 February temporary rule to all future fishing seasons in the region, or (b) close the Southeast U.S. Restricted Area to all gillnet fishing with the exception agreed to by the Southeast Subgroup of the Atlantic Large Whale Take Reduction Team at its April 2006 meeting.	On 24 October 2006, the Service responded that it has been working expeditiously to evaluate the next steps consistent with the requirements of the Atlantic Large Whale Take Reduction Plan's implementing regulations.
10 October to National Marine Fisheries Service	Regarding a request from the Moss Landing Harbor District to take small numbers of Pacific harbor seals and California sea lions incidental to redevelopment of the Moss Landing Harbor, Monterey County, California, the Commission recommended issuance of the incidental harassment authorization.	The incidental harassment authorization was issued on 31 October 2006.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
11 October to Fish and Wildlife Service	<p>Regarding applications from Point Defiance Zoo and Aquarium (facility no. 118210 – PRT-134592, PRT-134593, PRT-134594, PRT-134595), Oregon Coast Aquarium (facility no. 134615), The Seattle Aquarium (facility no. 116642), and Sea World, Inc., San Diego (facility no. 114750) to maintain rehabilitated sea otters and walruses in captivity for purposes of public display, the Commission recommended approval of the requested permits for the three walruses and four sea otters from populations other than the southwest Alaska stock with provisions. The Commission recommended that the requested permits for the five sea otters from the southwest Alaska population be denied because such permits are precluded by section 101(a)(3)(B) of the Marine Mammal Protection Act, and that the continued maintenance of these animals at the requesting facilities be authorized under section 109(h) of the Marine Mammal Protection Act, and, if no authorization for their continued maintenance exists under the Endangered Species Act, a permit be sought under section 10 of that Act. The Commission further recommended that the Service consider amending its special rules applicable to northern sea otters to authorize the maintenance of unreleasable sea otters (both these animals and otters that may strand in the future) under the Endangered Species Act if authorized pursuant to section 19(h) of the Marine Mammal Protection Act.</p>	<p>Point Defiance Zoo and Aquarium (facility no. 118210): Permit application no. PRT-134592 was withdrawn in 2006; action on applications PRT-134593, PRT-134594, and PRT-134595 were pending at the end of 2006.</p> <p>Oregon Coast Aquarium (facility no. 134615): Permit application no. PRT-134596 was withdrawn in 2006.</p> <p>The Seattle Aquarium (facility no. 116642): Permit applications PRT-134587, PRT-134589, PRT-134590, and PRT-134591 were withdrawn in 2006; action on permit application no. PRT-134588 was pending at the end of 2006.</p> <p>Sea World, Inc., San Diego (facility no. 114750): Permit nos. PRT-134585 and PRT-134586 were issued on 15 November 2006.</p>
13 October to National Science Foundation	<p>Regarding an application from the Southwest Fisheries Science Center received by the Office of Polar Programs under the Antarctic Conservation Act of 1978, the Commission noted that the Center previously sought a permit to conduct research on Antarctic pinnipeds from the National Marine Fisheries Service pursuant to the Marine Mammal Protection Act. The Commission forwarded copies of its recommendations on those applications to the National Science Foundation.</p>	

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
<p>23 October to Joint Subcommittee on Ocean Science and Technology</p>	<p>Regarding the draft Ocean Research Priorities Plan, the Commission commented that the Plan represents a significant achievement in ocean science and management and will provide a milestone in our nation's efforts to develop a sustainable relationship with our natural marine environment. The Commission suggested that the Joint Subcommittee consider strengthening the plan as follows:</p> <ul style="list-style-type: none"> • focus additional attention on understanding the human activities that may affect marine ecosystems; • expand the breadth of the plan to incorporate research cooperation and coordination with other nations; • ensure that long-term goals are not compromised by excessive focus on short-term results; • focus greater attention on pollutants, harmful algal blooms, and dead zones because they reflect the connectedness of ecosystems and the diffuse nature of human impacts on the marine environment; and • give additional attention to adaptive, experimental approaches to ocean research and management. 	
<p>26 October to National Marine Fisheries Service</p>	<p>Regarding the Service's draft 2006 stock assessment reports for marine mammals, the Commission commended the Service for its information-gathering and analysis efforts. The Commission recommended that the Service—</p> <ul style="list-style-type: none"> • work with federal and state fisheries management agencies and industry to develop a fair and sustainable funding strategy to support effective observer programs for collecting information on incidental mortality and serious injury; • proceed expeditiously to establish biologically meaningful stock boundaries for harbor seals in Alaska; • convene a take reduction team for false killer whales in the Pacific Islands region, including at least the U.S. waters surrounding Hawaii and Palmyra Atoll; and • adjust stock assessment guidelines to ensure consistent methods for identifying strategic stocks. 	<p>The final rule had not been published at the end of 2006.</p>

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
30 October to National Marine Fisheries Service	Regarding a request from the Scripps Institution of Oceanography to take small numbers of marine mammals by harassment incidental to conducting a marine seismic survey in the South Pacific Ocean, the Commission recommended that the Service issue the requested authorization, provided that the applicant be required to conduct all practicable monitoring and mitigation measures that reasonably can be expected to protect the potentially affected marine mammal species from serious injury.	The incidental harassment authorization was issued on 13 December 2006.
30 October to National Marine Fisheries Service	Regarding the Service's request for comments on a proposal to issue regulations to govern the taking of marine mammals incidental to operation of the U.S. Navy's Surveillance Towed Array Sensor System Low-Frequency Active (SURTASS LFA) sonar, the Commission recommended that the Service publish proposed regulations to govern the taking of marine mammals incidental to the deployment and use of the LFA and Compact Low-Frequency Active (CLFA) sonar systems. (See Chapter X for discussion of the Commission's comments.)	The proposed rule had not been published at the end of 2006.
1 November to National Marine Fisheries Service	Regarding application no. 978-1857 (Paul E. Nachtigall, Ph.D.), the Commission recommended approval with provisions. The application proposed to obtain audiometric data on up to three bottlenose dolphins and one false killer whale to determine thresholds for hearing and performance on echolocation tasks along with standard auditory brainstem response procedures.	The permit had not been issued at the end of 2006.
7 November to National Marine Fisheries Service	Regarding a request from the Lamont-Doherty Earth Observatory to take small numbers of marine mammals by harassment incidental to conducting an acoustic calibration and seismic testing program in the northern Gulf of Mexico in the fall of 2006, the Commission recommended that: <ul style="list-style-type: none"> • before issuing the requested authorization, the Service take steps to ensure that the planned monitoring program will be sufficient to detect, with reasonable certainty, all marine mammals within or entering the identified safety zones; • observations be made during all ramp-up procedures to gather data regarding the effectiveness of ramp-up as a mitigation measure; and • the monitoring period prior to the initiation of seismic activities be extended to one hour. 	

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
13 November to National Marine Fisheries Service	Regarding a request from Bay Marina Management, Inc. to take small numbers of marine mammals by harassment incidental to maintenance dredging in the area of the Pier 39 Marina, San Francisco, California, the Commission recommended that the Service issue the requested authorization as proposed.	The incidental harassment authorization was pending at the end of 2006.
17 November to National Marine Fisheries Service	Regarding a request from Glenn R. VanBlaricom, Ph.D., to take small numbers of California sea lions, Pacific harbor seals, and northern elephant seals by harassment incidental to research activities to assess the trends in black abalone populations at San Nicolas Island, California, the Commission recommended that the Service issue the requested authorization as proposed.	The incidental harassment authorization was issued on 1 December 2006.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
<p>17 November to Alaska Federal Highway Administration</p>	<p>Regarding the Alaska Federal Highway Administration’s Knik Arm Crossing Draft Environmental Impact Statement (DEIS), the Commission commented that—</p> <ul style="list-style-type: none"> • except for a brief acknowledgment in the summary conclusions, the DEIS does not discuss the potential for bridge-related activities cumulatively to have significant adverse impacts on beluga whales; • the assessment of the population of Cook Inlet beluga whales and its trends is in stark contrast to the conclusions reached in a recent study published by IUCN–The World Conservation Union, which found the population to be critically endangered; • it is essential that the DEIS be revised to include the more accurate assessment of Cook Inlet beluga whale population trends in the IUCN study and to incorporate the most recent population estimates resulting from annual surveys conducted by the National Marine Fisheries Service; • the analyses also should discuss the existing risks to the beluga whale population in Cook Inlet generally and recognize that any additional perturbations might exacerbate an already dire situation; • it is doubtful that the mitigation measures proposed in the DEIS will be sufficient to bring the bridge construction project into compliance with the requirements of the Marine Mammal Protection Act; • it is doubtful whether data from a single year are sufficient to draw generally applicable conclusions about beluga whale habitat-use patterns in and around Knik Arm. <p>The Commission provided a copy of its 23 August 2006 letter to the National Marine Fisheries Service regarding the Knik Arm Bridge and Toll Authority’s request for an incidental take authorization.</p>	<p>The Final Environmental Impact Statement had not been published at the end of 2006.</p>

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
24 November to National Marine Fisheries Service	<p>Regarding the Service intent to prepare an environmental impact statement to assess the potential impacts on the human environment that could result from regulations being considered to protect wild Hawaiian spinner dolphins, the Commission recommended that—</p> <ul style="list-style-type: none"> • in drafting its environmental impact statement, the Service develop a preferred alternative that includes time/area closures, restrictions on operating conditions (e.g., speed limits), and codification of the Service’s existing guidelines for viewing spinner dolphins; and • the draft environmental impact statement focus not only on the taking prohibition of the Marine Mammal Protection Act as the statutory basis for possible regulations to protect spinner dolphins but also on discussing the independent authority under sections 2(2) and 112(a) of the Act as an additional basis for regulations designed to protect essential habitats, such as spinner dolphin resting areas. 	The Service was reviewing comments at the end of 2006.
1 December to Naval Facilities Engineering Command	<p>Regarding the Navy’s intention to evaluate the potential environmental consequences of mine warfare and antisubmarine warfare active sonar training exercises along the U.S. East Coast and Gulf of Mexico, the Commission suggested that—</p> <ul style="list-style-type: none"> • the Navy consider the potential range of effects and mitigation measures on a species-by-species basis; • the proposed alternatives be broadened to include an approach based on a mixture of species-specific geographical and seasonal adjustments; • in the analysis of cumulative effects, the Navy describe the multiple training ranges and training activities under way in the action area and the means for coordinating the activities to avoid or minimize cumulative effects. 	
4 December to National Marine Fisheries Service	Regarding a request to amend permit no. 775-1600-00 (Northeast Fisheries Science Center), the Commission recommended approval with provisions. The request proposed to increase the number of right whale calves less than six months of age, excluding newborns, authorized to be biopsy sampled from 15 to 30 times annually.	The permit had not been issued at the end of 2006.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
4 December to National Marine Fisheries Service	Regarding application no. 373-1868-00 from PRBO Conservation Society, the Commission recommended approval with provisions. The application proposed to conduct three projects to study and monitor population trends, health, and ecology of pinnipeds at the Farallon Islands, Point Reyes Peninsula, Año Nuevo Island, San Francisco Bay, and in Sonoma County near the Russian River, over a five-year period.	The permit had not been issued at the end of 2006.
11 December to National Science Foundation	Regarding an application from Bruce R. Mate of the Hatfield Marine Science Center, Oregon State University, received by the Office of Polar Programs under the Antarctic Conservation Act of 1978, the Commission noted that Dr. Mate previously sought a research permit to conduct research on humpback, blue, and fin whales in waters off Antarctica from the National Marine Fisheries Service pursuant to the Marine Mammal Protection Act. The Commission forwarded copies of its recommendations on those applications to the National Science Foundation. The Commission noted that it does not appear that permit no. 369-1757 specifically authorizes the conduct of activities on these species in waters off Antarctica. The Commission therefore recommended that the National Science Foundation (1) contact the National Marine Fisheries Service for clarification of the precise locations where research on these species is authorized under the permit, and (2) refrain from issuing an Antarctic Conservation Act permit for any activities for which a Marine Mammal Protection Act authorization has not also been issued.	The permit had not been issued at the end of 2006.
19 December to National Marine Fisheries Service	Regarding the Service's proposed rule to amend regulations under the Atlantic Large Whale Take Reduction Plan covering gillnet fishing in the right whale calving grounds off the southern United States, the Commission supported the Service's proposal to extend the boundaries of the southeast U.S. restricted area northward to the South Carolina–North Carolina border and recommended that the Service adopt its proposed rule subject to the following modifications: <ul style="list-style-type: none"> • extend the closure period for the northern portion of the proposed restricted area (i.e., waters off South Carolina) to 1 November to 30 April; and • extend the outer boundary of the entire proposed restricted area (i.e., including the northward extension) to the seaward edge of the U.S. Exclusive Economic Zone. 	The final rule had not been published at the end of 2006.

DATE	COMMISSION RECOMMENDATION	AGENCY RESPONSE
20 December to Fish and Wildlife Service	Regarding application no. PRT-107933 (Wildlife Trust, Inc.), the Commission recommended approval with provisions. The application proposed to conduct research on the distribution, abundance, movement patterns, survival rates, site fidelity, and reproductive activities of free-ranging Florida manatees.	The permit had not been issued at the end of 2006.