

# The Marine Mammal Commission

## Annual Report to Congress 2004



# **MARINE MAMMAL COMMISSION**

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## **Annual Report to Congress**

**2004**

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

**31 May 2005**

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# Chapter I

## INTRODUCTION

This is the 32nd Annual Report of the Marine Mammal Commission, covering the period 1 January through 31 December 2004. The Commission submits its reports to Congress pursuant to section 204 of the Marine Mammal Protection Act of 1972.

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

The purpose of this report is to provide timely information on management issues and events under the purview of the Marine Mammal Commission in 2004. The Commission provides its report to Congress, federal and state agencies, public interest groups, the academic community, private citizens, and the international community. When combined with past reports, it describes the evolution and progress of U.S. policies and programs to conserve marine mammals and their habitats. To ensure accuracy, the Commission asks federal and state agencies and knowledgeable individuals to review report drafts before publication.

The Commission consists of three members nominated by the President and confirmed by the Senate. The Marine Mammal Protection Act requires that Commissioners be knowledgeable in marine ecology and resource management. The Commission Chairman, after consultation with the Council on Environmental Quality, the Smithsonian Institution, the National Science Foundation, and the National Academy of Sciences, and with the concurrence of other Commissioners, appoints people to the nine-member Committee of Scientific Advisors on Marine Mammals. The Marine Mammal Protection Act requires

that committee members be scientists knowledgeable in marine ecology and marine mammal affairs.

Appropriations to the Marine Mammal Commission in the past five fiscal years have been as follows: FY 2000, \$1,265,000; FY 2001, \$1,696,260; FY 2002, \$1,956,000; FY 2003, \$3,050,000; and FY 2004, \$1,856,000 plus a transfer of \$1,194,000 from the National Oceanic and Atmospheric Administration. The Commission's appropriation for the current fiscal year, FY 2005, is \$1,890,000 plus a transfer of \$1,190,826 from the National Marine Fisheries Service.

### Commission Activities during FY 2004

In response to congressional directives, in 2004 the Commission continued or initiated activities related to four areas. Those activities are discussed here.

#### Marine Mammals and Sound

In its fiscal year 2003 appropriation, Congress provided additional funds to the Commission over the President's requested amount and directed the Commission to hold "...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 Commission worked with the U.S. Institute for Environmental Conflict Resolution to hire a facilitation team to organize and manage the meetings. The Commission chartered the group in compliance with the Federal Advisory Committee Act. The Advisory Committee on Acoustic Impacts on Marine Mammals met three times in 2004. The Commission will continue holding meetings of the Advisory Committee

and anticipates receiving a final report from the committee in 2005. For a more complete discussion of the Advisory Committee, see Chapter IV of this report.

### **Beaked Whale Workshop**

As a related activity to its sound project, the Commission held a technical workshop on beaked whales (Family Ziphiidae) 13–16 April 2004 in Baltimore, Maryland. The workshop's goals were to (1) assess current knowledge of recent stranding events involving beaked whales and their biology and ecology, (2) identify and characterize factors that may have caused those strandings, (3) identify data needed to investigate possible causal relationships, and (4) recommend research, management, and mitigation strategies specific to beaked whales and acoustic impact. Additional information on the beaked whale workshop is provided in Chapter III.

### **Endangered Species Viability and Program Cost Effectiveness**

In FY 2004 Congress directed the Commission to “review the biological viability of the most endangered marine mammal populations and make recommendations regarding the cost-effectiveness of current protection programs.” During 2004 the Commission formed an organizing committee to design a project for undertaking this review. The Commission will hold a series of meetings on population viability of marine mammals in 2005. Following the review and a determination of what are the most endangered marine mammals, the Commission will evaluate various aspects of current protection programs, including their cost-effectiveness. For a more complete discussion of this project, see Chapter IV of this report.

### **Killer Whale Predation in the North Pacific Ocean**

An additional part of the FY 2004 congressional appropriation directed the 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.” The Commission formed an organizing committee that planned two workshops on this topic to be held in spring 2005. For a more complete discussion of this project, see Chapter IV of this report.

## **The U.S. Commission on Ocean Policy and the U.S. Ocean Action Plan**

The U.S. Commission on Ocean Policy submitted its final report, *An Ocean Blueprint for the 21st Century*, to President Bush and the Congress in 2004. Representatives of the Marine Mammal Commission testified at a Commission on Ocean Policy public session and worked with the staff on components of its analysis dealing with marine mammal and endangered species protection and ecosystem management. The report makes a series of recommendations to (1) improve governance, (2) use sound science for decision making, (3) improve ocean-related education, (4) improve coastal and ocean resource management, and (5) establish an Ocean Policy Trust to fund improved coastal and ocean management by state and federal agencies.

For marine mammals and endangered species, the Commission on Ocean Policy made a series of recommendations. It called on Congress to update both the Marine Mammal Protection Act and Endangered Species Act in ways that account for ecosystem-based management. The Commission on Ocean Policy recommended consolidating research and management of marine mammals within the National Oceanic and Atmospheric Administration and maintaining the Marine Mammal Commission in its current independent oversight role while coordinating with all relevant federal agencies through the National Ocean Council. The Commission on Ocean Policy also made several recommendations regarding modifying the definition of harassment under the Marine Mammal Protection Act and streamlining the permitting process. It called on agencies to expand research to better understand marine mammals and potential human-caused impact on their populations including, specifically, the potential impact of ocean noise.

The Administration issued its *U.S. Ocean Action Plan: The Bush Administration's Response to the U.S. Commission on Ocean Policy* on 17 December 2004. Marine Mammal Commission staff participated on several interagency working groups that formulated the response, which the White House Council on Environmental Quality coordinated. Also on 17 December President Bush signed Executive Order 13366 establishing a cabinet-level Committee on Ocean

Policy to coordinate activities of Executive Branch agencies on ocean-related matters and to coordinate and consult with states, tribes, local governments, the private sector, and international organizations. The Ocean Action Plan lays out a series of action items to enhance ocean leadership and coordination, advance understanding of oceans and coasts, and enhance the use and conservation of ocean and coastal resources.

It calls on government agencies to “continue to work towards an ecosystem-based approach in making decisions related to water, land, and resource management in ways that do not erode local and state authorities and are flexible to address local conditions.” The plan states that the Administration will propose updated legislation to reauthorize the Marine Mammal Protection Act for consideration by the 109th Congress.



## Chapter II

### SPECIAL FOCUS: THE PACIFIC ISLANDS REGION

Each year the Marine Mammal Commission holds its annual meeting in a different region of the country. This shift in venue allows more in-depth inquiry into issues pertinent to each region. In 2004 the Commission and its Committee of Scientific Advisors met in Kailua-Kona, Hawaii, with discussions focusing on issues in the Pacific Islands area. In this report, the Commission has carried over this special regional focus to allow more in-depth description of important regional conservation issues.

The recent designation of the Pacific Islands Region in the National Marine Fisheries Service provided an opportunity for this shift in focus. The Service is developing its strategies for research and management in this new region, and the Commission views this transition as a useful opportunity to assist the Service in the development of those strategies. This chapter of the annual report focuses on the challenges faced by the new Pacific Islands Regional Office and the Pacific Islands Fisheries Science Center. It begins by describing some of the key issues and species requiring careful research and management. It then provides an overview of reserves, refuges, and sanctuaries in the region, as they provide a broadscale management foundation for marine mammal and marine ecosystem conservation. Finally, the chapter describes several of the key considerations and actions needed to bring about effective ecosystem-based management in this region.

#### **Pacific Islands Regional Office and Fisheries Science Center**

On 21 April 2003 the National Marine Fisheries Service established its Pacific Islands Region by elevating the former Pacific Islands Area Office to

the Pacific Islands Regional Office and the Honolulu Laboratory of the Southwest Fisheries Science Center to the Pacific Islands Fisheries Science Center. The establishment of the new region does not change the Service's statutory authorities or responsibilities under the Magnuson-Stevens Fishery Conservation and Management Act, the Marine Mammal Protection Act, the Endangered Species Act, or other laws. Rather, it reflects a growing recognition of the vastness of the nation's holdings in the central Pacific Ocean, the resources therein, and the challenge of managing them.

The Exclusive Economic Zone (EEZ) of the Pacific Islands Region is vast (Fig. 1). It includes about 1.7 million square nautical miles (nmi), an area equal to that of the entire EEZ for the U.S. mainland including Alaska. The single largest portion of the Pacific Islands EEZ surrounds the Hawaiian archipelago, stretching from the island of Hawaii in the east to Kure Atoll in the west. In addition, the Pacific Islands EEZ includes the waters out to 200 nmi around Johnston Atoll, Kingman Reef and Palmyra Atoll, Baker and Howland Islands, Jarvis Island, American Samoa, the Northern Mariana Islands, and the island of Guam.

Within this region, commercial, recreational, and artisanal fishermen use a range of fishing methods including longline, trolling, pot, gillnet, hook and line, and various artisanal methods (e.g., throw nets). The largest domestic fisheries include the Hawaiian bottomfish fishery, Hawaiian tuna longline fishery, Hawaiian swordfish longline fishery, and Samoan longline fishery. In addition, extensive international fisheries, primarily using longlines to catch tuna and swordfish, occur in the waters outside the EEZ with potential effects on resources that overlap the EEZ boundary or move back and forth across it.

Research on and management of the marine resources within this area are an enormous challenge.



Figure 1. Light gray areas represent the Exclusive Economic Zones of the Pacific Islands Region. Figure courtesy of the Western Pacific Fishery Management Council.

rine sanctuary. The State of Hawaii owns Kure Atoll and has management authority for most waters of the Hawaiian archipelago from the shoreline seaward to a distance of three miles. Other agencies, such as the Navy and Coast Guard, have important responsibilities throughout the Pacific Islands Region and also contribute to the overall effort to conserve and manage the nation's resources in that region. In addition, territorial governments such as those of Guam and American Samoa play an important role in regional conservation and management efforts. Clearly, much important conservation and management work is being done. Nonetheless, as indicated in the following sections, a great deal more cooperation and coordination among agencies is needed to ensure conservation of marine mammals and marine ecosystems in the Pacific Islands Region.

Until recently, Hawaiian monk seals (*Monachus shauinslandi*) and humpback whales (*Megaptera novaeangliae*) have been the major focus of research and management on marine mammals in the central Pacific Ocean. Both species are listed as endangered and are in need of additional research and protection to ensure their conservation. At the same time, the establishment of a new regional office and science center, with the associated increases in staffing and funding, provides an opportunity to reassess this challenge; develop new research and management strategies; revitalize, redirect, and extend existing research and management programs; and implement new programs.

To fulfill its statutory requirements, the National Marine Fisheries Service must work with other agencies and organizations with related responsibilities. The U.S. Fish and Wildlife Service plays a crucial role in protecting much of the terrestrial habitat upon which Hawaiian monk seals depend and nearshore habitat vital to certain marine mammal species (e.g., spinner dolphins [*Stenella longirostris*]). The National Ocean Service manages the Hawaiian Islands Humpback Whale National Marine Sanctuary and the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve and will continue to manage them if and when the reserve is converted to a national ma-

## Cetacean Research and Management in the Pacific Islands Region

A new strategy is needed for cetacean research and management in the Pacific Islands Region. Previous efforts have fallen well short of meeting the Marine Mammal Protection Act requirements for information needed to manage and conserve these stocks. Developing a new strategy will be a great challenge in view of the vastness of the EEZ in the region, the large number of cetacean stocks that occur there, their potential vulnerability to fishery interactions, and the limited resources available for implementation of the strategy. For any strategy to be effective, it will have to include suitable and sufficient resources for both research and management purposes, including staffing, funding, infrastructure, and monitoring capabilities (e.g., observer programs, stranding programs). Because of the great distances between sections of the EEZ, transportation systems based solely on large vessels are likely to be expensive and inefficient, as many of their at-sea days would be spent steaming from one location to another. It is therefore likely that the new strategy will require development of local resources or resource centers throughout the region, partnerships with other U.S. agencies that work

within this region (e.g., the Navy and Coast Guard), and, on matters of international concern, cooperation with international research and management organizations. At least in the foreseeable future, partnering of the Pacific Islands Fisheries Science Center and the Southwest Fisheries Science Center will be particularly important because of the greater expertise at the Southwest Center on matters pertaining to cetacean surveys. Successful development and implementation of such a strategy will require a sustained increase in resources and support from National Marine Fisheries Service headquarters. The establishment of the Pacific Islands Regional Office and Fisheries Science Center provides an opportunity to make the changes needed to ensure that the resources within this EEZ are properly conserved and managed. The following are some of the key issues and topics to be addressed in research and management on cetaceans in the Pacific Islands Region.

### Stock Assessment

As required under section 117 of the Marine Mammal Protection Act, stock assessment provides the foundation for management, particularly with regard to the vulnerability of these stocks to direct fishery interactions but also related to other human activities. Stock assessment reports for the Pacific list 27 stocks of 24 cetacean species in this region, including two that are currently considered provisional (Table 1). With the exception of humpback whales and spinner dolphins, relatively little research and management have been directed toward these stocks.

The principal elements of stock assessment are identification of stocks (or stock structure), determination of abundance and trends, assessment of serious injury and mortality due to fishery interactions, and determination of stock status and requirements for management. Scientists are just beginning to investigate stock structure in this region, and undoubtedly a number of new stocks will be identified as that work proceeds. For example, recent evidence suggests that bottlenose dolphins (*Tursiops truncatus*) in the main Hawaiian Islands constitute several groups with limited home ranges and similarly limited genetic exchange between or among them. Additional research on stock structure is needed to ensure that stock assessment efforts are aimed at the appropriate units of conservation.

Once stocks have been identified, the most basic information required under section 117 includes

abundance, trends, and levels of serious injury and mortality due to human activities, particularly fisheries. This information is needed to estimate each stock's potential biological removal (PBR) level and identify strategic stocks needing additional protection. Although abundance estimates are available for most of the stocks in the Pacific region, the estimates are imprecise (i.e., contain considerable amounts of error about the estimated level, as indicated by large [ $>0.3$ ] coefficients of variation) and likely biased in that they are rarely based on a stock's entire distribution, which, more often than not, is unknown. In essence, abundance estimates for the majority of these stocks should be considered rough, at best. In the absence of periodic, reliable estimates of abundance for the majority of stocks in this region, trends in abundance are reported as "not available" for all but two of them. The existing data for humpback whales in the central Pacific are sufficient to suggest that their abundance has increased since the 1980s but are not sufficient to determine the rate of increase. With regard to the remaining cetacean stocks in this region, it is not possible to determine with confidence whether they are increasing, stable, or declining.

In this regard, two recent research programs are exceptional. In 2002 the Southwest Fisheries Science Center conducted the Hawaiian Islands cetacean and ecosystem assessment survey (known as HICEAS) throughout the U.S. EEZ around the Hawaiian archipelago. This was the first survey of its kind in this region and marks an important progression in the assessment of cetaceans in the Pacific Islands (Table 2). The second assessment is aimed at humpback whales in the North Pacific and referred to as SPLASH (structure of populations, levels of abundance, and status of humpbacks). The SPLASH assessment, described in more detail following, is an international effort that began field studies in 2004 and is expected to continue those studies in 2005.

The third type of information essential for comprehensive stock assessment is the level of serious injury and mortality from human-related activities. Here, too, this information is largely unavailable for the majority of stocks and fisheries throughout the Pacific Islands Region. The primary means of assessing serious injury and mortality levels from fisheries is through observer programs. Since the mid- to late 1990s observer coverage for the longline fisheries has been increased from about 4 percent annually to about 10 percent in 2000. The current target level of cover-

**Table 1. Pacific Region stock assessment report data<sup>1</sup>**

Species	Stock	Status	Estimated Abundance	CV	Population Trend	Bycatch/Mortality (CV)
Hawaiian monk seal	Hawaii	Endangered	1,304	—	-1.1 %/Yr	N/A
Rough-toothed dolphin	Hawaii	Not strategic	19,904	0.52	N/A	N/A
Risso's dolphin	Hawaii	Not strategic	2,351	0.65	N/A	0.0
Bottlenose dolphin	Hawaii	Not strategic	3,263	0.60	N/A	0.2
Spotted dolphin	Hawaii	Not strategic	10,260	0.41	N/A	0.0 (in Hawaii), 0.8 (in Palmyra)
Spinner dolphin	Hawaii	Not strategic	2,805	0.66	N/A	0.0
Striped dolphin	Hawaii	Not strategic	10,385	0.48	N/A	N/A
Fraser's dolphin	Hawaii	Not strategic	16,836	1.11	N/A	N/A
Melon-headed whale	Hawaii	Not strategic	2,947	1.11	N/A	N/A
Pygmy killer whale	Hawaii	Not strategic	817	1.12	N/A	N/A
False killer whale	Hawaii	Strategic	268	1.08	N/A	4.4
False killer whale	Palmyra (provisional)	Strategic?	N/A	N/A	N/A	2.4
Killer whale	Hawaii	Not strategic	430	0.72	N/A	N/A
Short-finned pilot whale	Hawaii	Not strategic	8,846	0.49	N/A	0.0
Short-finned pilot whale	Palmyra (provisional)	Not strategic	N/A	N/A	N/A	0.8
Blainville's beaked whale	Hawaii	Not strategic	2,138	0.77	N/A	0.8
Cuvier's beaked whale	Hawaii	Not strategic	12,728	0.83	N/A	N/A
Longman's beaked whale	Hawaii	Not strategic	766	1.05	N/A	N/A
Pygmy sperm whale	Hawaii	Not strategic	7,251	0.77	N/A	N/A
Dwarf sperm whale	Hawaii	Not strategic	19,172	0.66	N/A	N/A
Sperm whale	Hawaii	Endangered	7,082	0.30	N/A	0.0
Humpback whale	Eastern North Pacific	Endangered	1,034	0.11	Fluctuating	0.8
Blue whale	Eastern North Pacific	Endangered	1,744	0.28	N/A	N/A
Blue whale	Western North Pacific	Endangered	N/A	N/A	N/A	N/A
Fin whale	Hawaii	Endangered	174	0.72	N/A	N/A
Bryde's whale	Hawaii	Not strategic	493	0.34	N/A	N/A
Sei whale	Hawaii	Endangered	77	1.06	N/A	N/A
Minke whale	Hawaii	Not strategic	N/A	N/A	N/A	N/A

<sup>1</sup> Data provided by the National Marine Fisheries Service.

age is 20 percent for the longline fisheries, which has been achieved in some cases and is currently being increased to that level in other fisheries. However, ob-

server coverage is nonexistent for other nations fishing in international waters of the region. Stocks that overlap the U.S. EEZ boundary or move back and

**Table 2. Preliminary results from the 2002 HICEAS survey<sup>1</sup>**

Species	Number of Sightings	Abundance	Density of Individuals per 1,000 km <sup>2</sup>	CV
Offshore spotted dolphin	8	10,260	4.18	0.41
Striped dolphin	11	10,385	4.23	0.48
Spinner dolphin	4	2,804	1.14	0.66
Rough-toothed dolphin	14	19,904	8.11	0.52
Bottlenose dolphin	9	3,263	1.33	0.60
Risso's dolphin	5	2,351	0.96	0.65
Fraser's dolphin	1	16,836	6.86	1.11
Melon-headed whale	1	2,947	1.20	1.10
Pygmy killer whale	1	817	0.33	1.12
False killer whale	1	268	0.11	1.08
Short-finned pilot whale	14	8,846	3.61	0.49
Killer whale	2	430	0.18	0.72
Sperm whale	18	7,082	2.89	0.30
Pygmy sperm whale	2	7,251	2.96	0.77
Dwarf sperm whale	3	19,172	7.82	0.66
Unidentified beaked whale	1	33	0.13	1.05
Blainville's beaked whale	1	2,138	0.87	0.77
Cuvier's beaked whale	2	12,728	5.19	0.83
Longman's beaked whale	1	766	0.31	1.05
Bryde's whale	8	493	0.20	0.34
Sei whale	1	77	0.03	1.06
Fin whale	2	174	0.07	0.72
Delphinids pooled	71	79,112	32.25	0.00
Beaked whales pooled	5	15,962	6.51	0.00

<sup>1</sup> Data provided by the National Marine Fisheries Service.

forth across it are subject to levels of take that are unknown but that may be significant and increasing due to increased fishing effort outside the U.S. EEZ.

The lack of information on stock structure, abundance and trends, and serious injury and mortality levels for these stocks effectively precludes proper application of the PBR framework established in sections 117 and 118 of the Marine Mammal Protection Act for limiting the incidental taking of marine mammals in commercial fisheries. In the absence of reasonably accurate and precise information, the tolerance of the various stocks in this region for fisheries-related mortality cannot be estimated reliably, some strategic stocks (i.e., those needing additional

protection) are likely to go undetected, and, over time, some stocks are more likely to become depleted.

#### **False Killer Whales and Longline Fisheries**

False killer whales (*Pseudorca crassidens*) (Fig. 2) provide an example of the need for better stock assessment information. False killer whales are found in tropical and temperate waters worldwide, including the Pacific Islands Region. The stock structure of this species is poorly known, although recent genetic evidence suggests that animals around Hawaii may be distinct from other groups. Currently, the National Marine Fisheries Service recognizes three stocks in the central Pacific: (1) a Hawaiian stock occurring within U.S. waters surrounding

the Hawaiian archipelago, (2) a Palmyra stock occurring within U.S. waters surrounding Palmyra Atoll, and (3) an undefined stock throughout international waters and the rest of the Pacific Islands Region.

False killer whales are taken incidentally by Hawaiian longline fisheries and similar international fisheries. Generally, the take appears to result during false killer whale depredation on the fisheries' catch. In recent years the number of animals taken from the Hawaiian stock has exceeded the calculated PBR level. In 2004 the estimated abundance of the Hawaiian stock was 268 whales, PBR for the stock was 1.0 whale, and the estimated fisheries take was 4.4 whales. As a result, the Service elevated the Hawai-



Figure 2. False killer whale. Photo courtesy of Eric Forney, National Marine Fisheries Service's Hawaii Longline Fishery Observer Program.

ian longline fisheries to category I under the Marine Mammal Protection Act. The Commission supported the Service's decision to reclassify these fisheries.

At the Marine Mammal Commission's 2004 annual meeting, Service staff indicated that they did not intend to convene a take reduction team and develop and implement a take reduction plan for the Hawaiian stock of false killer whales, as required by section 118 of the Act. Instead, they indicated that the Service's Northeast Region was planning to convene a take reduction team to reduce cetacean mortality in Atlantic longline fisheries and anticipated that the resulting mitigation measures could be applied in both locations. The Commission noted that well-executed take reduction teams provide a regional forum for local fishermen, agency staff, and environmental groups to work together to reach solutions, and it questioned whether methods and gear used in the two locations were sufficiently similar to permit common mitigation measures. At the end of 2004 the Commission was preparing a letter to the Service recommending that a Pacific Islands take reduction team be formed to address bycatch of false killer whales from the Hawaiian stock.

With regard to the Palmyra and international stocks, the Hawaiian longline fisheries were estimated to take 2.4 whales from the Palmyra region and 4.8 whales from international waters. Takes around Palmyra (3.5 takes/1,000 sets) were much more common than in the Hawaiian archipelago (0.1 takes/1,000

sets), suggesting that the Palmyra stock is more likely to be experiencing unsustainable mortality from U.S. fisheries, all other things being equal. The number of false killer whales taken by international fisheries cannot be estimated for any of the three stocks. Such takes may have significant impact on the international stock as well as the Hawaiian and Palmyra stocks if they move in and out of the U.S. EEZ. The lack of abundance estimates for these stocks and the uncertainty regarding total takes in the fisheries preclude a definitive determination of their status. Existing information is sufficient to suggest that these stocks are vulnerable to fisheries take and that take reduction efforts are needed in the Pacific Islands Region. However, the information is not sufficient to fully evaluate the stock status and guide take reduction efforts in accordance with the Marine Mammal Protection Act.

### **Interactions with Spinner Dolphins in Hawaii**

Under the Marine Mammal Protection Act, all activities involving the "taking" of marine mammals are prohibited unless specifically authorized or permitted under the Act's provisions. Taking is defined to include harassing, hunting, capturing, or killing any marine mammal, or attempting to do so. The term "harassment" also is defined statutorily and includes any act of pursuit, torment, or annoyance that has (1) the potential to injure a marine mammal or marine mammal stock in the wild, or (2) the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering. As discussed in Chapter IX, permits may be issued to authorize taking for purposes of scientific research, species enhancement, public display, and commercial and educational photography. In addition, small-take authorizations can be issued to authorize unintentional taking incidental to a variety of activities. However, the Marine Mammal Protection Act does not provide a specific exception that allows taking for recreational viewing or other such interactions with wild marine mammals.

As discussed in previous Commission annual reports, public interactions with marine mammals in the wild (e.g., close approaches to observe, photograph, pose with, touch, swim with, or otherwise interact with the animals) have increased over the past several years. Growing evidence indicates that such activities may be adversely affecting the animals' welfare. Ani-

mals may be driven from preferred habitat; be injured by people trying to touch, prod, or feed them; or have their behavior changed in ways that encourage them to interact with humans and become pests or to be exposed to risks that they otherwise might not face. Because human interactions with marine mammals have the potential to disturb or injure wild marine mammals, they arguably constitute harassment under the Marine Mammal Protection Act.

The National Marine Fisheries Service promulgated regulations in 1991 to specify that feeding marine mammals in the wild constitutes a taking and, thus, is prohibited. However, determining when other types of interactions constitute a taking is not always so clear. Efforts to date by the Service to resolve this issue include the issuance of useful, but unenforceable, guidelines for responsible wildlife viewing; publication of a proposed rule in 1992 that would have established specific approach distances but that was subsequently withdrawn in the face of adverse public comments; and publication in 2002 of an advance notice of proposed rulemaking soliciting input as to what interactions between the public and wild marine mammals constitute takings under the Marine Mammal Protection Act and should be regulated. The advance notice of proposed rulemaking included a discussion of the Service's current policy that activities involving closely approaching or directly interacting with wild marine mammals have the potential to disrupt the animals' behavioral patterns and, as such, constitute harassment under the Act.

The Commission considered the issue of marine mammal/human interactions at its 2002 annual meeting, focusing on problems in California and Hawaii. That review prompted the Commission to write to the Administrator of the National Oceanic and Atmospheric Administration (NOAA) in May 2003 stressing the need to address the issue and recommending that greater enforcement effort be directed at the problem by the agency, particularly in Hawaii and in the agency's Southeast Region. The Commission further recommended that, if the agency was reluctant to pursue such cases in the absence of a clear-cut standard as to when harassment has occurred, the National Marine Fisheries Service take prompt action to promulgate regulations that set forth objectives for making such determinations.

The Administrator of NOAA responded by letter of 6 January 2004, indicating that the agency has made a significant investment in public education and

outreach to address interaction problems and, when appropriate, is prepared to investigate and prosecute cases of unlawful harassment. The response noted, however, that "enforcement efforts are based in part upon available personnel and budget resources, and upon established priorities," suggesting that, because of perceived difficulties in successfully bringing harassment cases under the Marine Mammal Protection Act, such cases were not high priorities for the agency. Inasmuch as changes to the statutory definition of the term harassment were being considered by Congress as part of the reauthorization of the Act, the agency was reluctant to expend resources to pursue a rulemaking to delineate more clearly what activities constitute harassment under the existing definition. The Administrator noted in this regard that the redefinition proposed by the Administration, if enacted, would bring greater certainty to the issue.

The Marine Mammal Commission again explored the issue of public interactions with spinner dolphins at its 2004 annual meeting in Kona, Hawaii. The Commission heard from National Marine Fisheries Service managers, enforcement personnel, and scientists and from independent researchers, tour operators, and other stakeholders concerning human/dolphin interactions in the wild in Hawaii. The Commission, its Committee of Scientific Advisors and staff, and invited guests also visited one of the spinner dolphin resting areas north of Kailua-Kona frequented by tour operators to see firsthand the types of interactions that are occurring.

Schools of spinner dolphins move offshore to feed on squid and other species that move into shallower waters at night. Recent research into spinner dolphin behavior has identified an intricate, cooperative feeding strategy in which a dolphin school encircles a cluster of prey. Pairs of dolphins take turns entering the aggregation of prey to feed while the others work to maintain the aggregation. The dolphins return to resting areas close to shore each morning. Consequently, tour operators and others wishing to view or swim with the dolphins can target these areas and have high confidence that dolphins will be present. Some of these encounters may result in harassment of individual dolphins. Ongoing research in Hawaii and elsewhere suggests that fewer dolphins may be using traditional resting areas or dolphins may be using them less often.

During discussion of this issue at the meeting, several people who had been on the Commission's

field trip expressed the view that at least some of the activities they had seen constituted intentional pursuit and harassment of dolphins. National Marine Fisheries Service representatives present on the trip noted, however, that the issue was not clear-cut and that opinions differ as to what activities constitute harassment. They did not believe that what observers had seen, although arguably harassment, would make a compelling enforcement case. Most participants in the discussion agreed that some of the difficulty in addressing potentially harmful interactions stems from statutory vagueness. Service representatives also reiterated a belief that proceeding with a rulemaking to clarify what types of encounters are and are not permissible would be an inefficient use of agency resources in light of pending proposals to amend the definition of harassment under the Marine Mammal Protection Act. They also suggested that, contrary to past agency statements on the topic, the Service did not have a national harassment policy for approaching or swimming with wild dolphins. That policy, if it still exists, is not binding on the public but provides guidance as to what activities the Service believes have the potential to disturb marine mammals.

The head of the National Marine Fisheries Service's Office of Law Enforcement noted that the Service has entered into a cooperative agreement with State of Hawaii officials to make additional resources available for enforcement activities under the Marine Mammal Protection Act, the Endangered Species Act, and other federal statutes in Hawaii. State officials reported, however, that federal funding for state activities under the cooperative agreement had not been provided. In fact, the Service's spokesman suggested that the agency was precluded from providing such funding under the provisions of the Marine Mammal Protection Act.

In addition to their consideration of stepped-up enforcement, participants at the Commission's meeting considered alternative approaches for addressing the problems presented by human/dolphin interactions in the ocean. Rather than relying on rigorous enforcement of the Act's taking prohibition to stem potentially harmful interactions, many people preferred a cooperative approach that would involve all stakeholders in an exploration of creative solutions. Several participants suggested that the Service convene a meeting of federal, state, and local government agencies, researchers, tour operators, and other

interested parties to identify when, where, and how interactions might be conducted without adversely affecting the dolphins. Among other things, such a process could consider the desirability of (1) establishing protected areas where dolphins can rest undisturbed by humans and/or where there would be temporal or spatial access restrictions, (2) limiting the number of vessels allowed in areas frequented by dolphins, and (3) restricting access to dolphin resting areas to tour operators that adopt and comply with specified wildlife viewing practices. Such a workshop should not limit itself to a specific statutory framework but should look beyond the limitations of existing laws to fashion a system that looks at the full scope of federal, state, and voluntary measures available to protect dolphins.

At the end of 2004 the Commission was working on a comprehensive set of letters to various state and federal agencies following up on the issues discussed at the annual meeting. The Commission expected to include several recommendations concerning actions to be taken to enhance the conservation of spinner dolphins in Hawaiian waters. The Commission anticipates that the following observations and recommendations will be included in those letters:

- Some of the ongoing activities involving spinner dolphins and boaters and swimmers in Hawaii unambiguously satisfy the Marine Mammal Protection Act's definition of harassment (i.e., they constitute an act of pursuit, torment, or annoyance that has the potential to disturb, or that actually disturbs, spinner dolphins). Accordingly, the National Oceanic and Atmospheric Administration and the National Marine Fisheries Service need to give greater enforcement attention to such interactions in Hawaii, and more cases should be brought, at least for the obvious instances of harassment.
- Although proceeding with a comprehensive rulemaking to clarify what constitutes harassment under the Marine Mammal Protection Act may not be warranted, given the amendments to the Act currently under consideration, the National Oceanic and Atmospheric Administration and the National Marine Fisheries Service should consider alternative interim actions to resolve the ambiguities in the existing definition of harassment. For example, the Service should consider issuing a policy statement tailored to address the situation involving spinner dolphins in Hawaii that provides explicit guidance and public notice of

what the agency considers pursuit or annoyance of marine mammals and what activities have the potential to disturb marine mammals.

- The basis for the view that funding state enforcement activities is precluded under the Marine Mammal Protection Act is not readily apparent in the statute. The Service should consider all provisions of the Act, some of which seem to authorize such funding, and/or provide additional explanation for its position.
- As recommended by participants at the annual meeting, the Service should convene a workshop to include government agencies and other interested parties to develop a comprehensive approach to solving the problems associated with human/dolphin interactions in Hawaii. Among other things, workshop participants should consider the establishment of protected areas for dolphins, placing other limits on vessel access to dolphin resting areas, and developing a certification program for tour operators that adhere to responsible dolphin-watching guidelines.
- Additional funding should be provided to the newly created Pacific Islands Regional Office and the Pacific Islands Fisheries Science Center to enable them to meet their research and conservation responsibilities for spinner dolphins and other species of marine mammals in the region.

### **State Management Authority under the Marine Mammal Protection Act**

In 1990 Hawaii enacted a law to prohibit parasailing in the navigable waters surrounding the western and southern shores of Maui between December 15 and May 15. These waters are within the Hawaiian Islands Humpback Whale National Marine Sanctuary. In 2003 one company affected by that seasonal ban, UFO Chuting of Hawaii, filed suit in federal district court challenging the validity of that law, claiming that it was inconsistent with section 109(a) of the Marine Mammal Protection Act, which preempts states from enforcing any state law relating to the taking of marine mammals unless management authority for such species has been transferred to the state. The defendants countered that, although the State's regulation was preempted under the Marine Mammal Protection Act, a parallel provision under the Endangered Species Act authorized states to adopt laws and regulations with respect to the taking of listed species that are more restrictive than those applicable under that Act. The State of Hawaii contended that section

17 of the Endangered Species Act and various statements in the legislative history of the two statutes supported the view that the apparent conflict should be resolved to give priority to the Endangered Species Act provision.

The court issued its ruling on 9 July 2004, finding in favor of the parasail operators. The court believed that section 109(a) of the Marine Mammal Protection Act preempted Hawaii's regulation and that neither the conflicting provision of the Endangered Species Act nor anything in the legislative history supported an alternative finding. The court further determined that the State's ban also was preempted by a freestanding provision enacted as part of the Marine Mammal Protection Act Amendments of 1994, which specifies that it is lawful to approach, by means other than aircraft, to within 100 yards of a humpback whale in waters surrounding the State of Hawaii.

The State of Hawaii appealed the ruling to the Ninth Circuit Court of Appeals. While that appeal was pending, Congress passed Public Law 108-447, providing federal agency appropriations for fiscal year 2005. Section 213 of that act specifies that, notwithstanding any other federal law related to the conservation and management of marine mammals, the State of Hawaii may enforce laws or regulations with respect to the operation in state waters of recreational and commercial vessels for the purpose of conserving and managing humpback whales, provided that the state law is no less restrictive than applicable federal law. (See Chapter VII concerning reauthorization of the Marine Mammal Protection Act for a more detailed discussion of this provision.) Based on enactment of this provision, the State of Hawaii filed a motion with the district court seeking reconsideration of the matter. Final resolution of the case was pending as of the end of 2004.

### **Humpback Whales and SPLASH (Structure of Populations, Levels of Abundance, and Status of Humpbacks)**

The humpback whale is one of the most celebrated marine species in Hawaii. It is listed as endangered under the Endangered Species Act and is the flag species for the Hawaiian Islands Humpback Whale National Marine Sanctuary. Each winter, humpbacks from a number of feeding areas in the North Pacific aggregate around the main Hawaiian Islands to calve and mate. During that period, they are the focus of considerable attention, particularly by tourists and

researchers. As noted earlier, existing evidence suggests that the number of humpback whales in Hawaiian waters each winter has increased over time, but the evidence is not sufficient to adequately characterize the rate of increase or current abundance.

Over the past several decades, research on humpback whales often was contentious due to the potential for unnecessary duplication of studies, the lack of coordination among researchers, the sometimes blurred distinction between tourism and bona fide research, and the challenge of managing research permits. The potential for contention remains, but considerable progress has been made in addressing these issues. Photo-identification studies, for example, have provided useful estimates of population abundance and promoted sharing of data and coordination among researchers. Their results are now providing important natural history information on humpback whales. Such information provides a basis for management of human activities to ensure protection of the whales. The SPLASH program, described here, reflects the considerable progress made in coordinating research on humpback whales in recent years.

Past management of humpback whales also was limited by lack of cooperation and trust among the multiple agencies with shared management responsibilities, including the National Marine Fisheries Service, the National Marine Sanctuary Program of the National Ocean Service, and the State of Hawaii. Some progress appears to have been made to build cooperation and trust. For its part, in 1992 the National Marine Sanctuary Program revised its management plan for the Hawaiian Islands Humpback Whale National Marine Sanctuary. The revision emphasizes the importance of cooperation on a number of topics. In addition, administrators of the sanctuary have generally sought to enhance the role of the sanctuary as a cultural and educational resource. They have offices on multiple islands to provide the public information on humpback whales and other marine mammals. More recently they have increased the role of sanctuary personnel in supporting humpback whale research, such as SPLASH, and in coordinating and responding to humpback whale entanglements and strandings (see later in this discussion).

The SPLASH program exemplifies the kind of progressive, creative research strategies that are needed for the Pacific Islands Region. The aim of SPLASH is to better describe the stock structure of endangered humpback whales in the North Pacific, to understand

the abundance and trends of those stocks, and to investigate the potential effects of human activities on them. The program is a cooperative effort of researchers from the United States, Canada, Mexico, Russia, and Japan.

The SPLASH program is directed by a steering committee of 15 scientists including representatives from each of the cooperating countries. Initial planning for SPLASH included two years of summer and winter research cruises in different regions of the North Pacific. In winter 2004 cruises were completed in waters off Hawaii, Asia (Philippines, Okinawa), Mexico, and Central America (El Salvador, Guatemala, Nicaragua, and Costa Rica) (Fig. 3). In summer 2004 cruises were conducted off the U.S. West Coast (California, Oregon, Washington), British Columbia, southeastern Alaska, northern and western Gulf of Alaska, the eastern/central Aleutian Islands, and the Kamchatka Peninsula of Russia. Additional cruises are planned for 2005. Individual identification using photographs of whale flukes and biopsy sampling are the principal means of data collection. Research cruises will also provide an opportunity to photo-document evidence of human interactions or effects (e.g., entanglement, vessel strikes, and exposure to noise).

The SPLASH program is being funded by the National Fish and Wildlife Foundation, the Southwest Fisheries Science Center and the National Marine Mammal Laboratory (National Marine Fisheries Service), the National Marine Sanctuary Program (NOAA National Ocean Service), the National Park Service, the World Wildlife Fund U.S., and the Marine Mammal Commission. Funding for year two of the program had not been fully secured by the end of 2004. Participants in the SPLASH program presented an overview of their program at the Marine Mammal Commission's 2004 annual meeting in Hawaii. Based on the progress evident in their presentations, the Commission was planning to write to NOAA and other cooperators recommending additional funding to complete the project.

### **Marine Mammal Stranding Response**

Marine mammal stranding events are common in the Hawaiian Islands. Such events evoke considerable attention from management agencies and the public, provide an opportunity to promote animal welfare, and provide a means for gathering information about the species that strand. Over the past several decades, various attempts have been made to

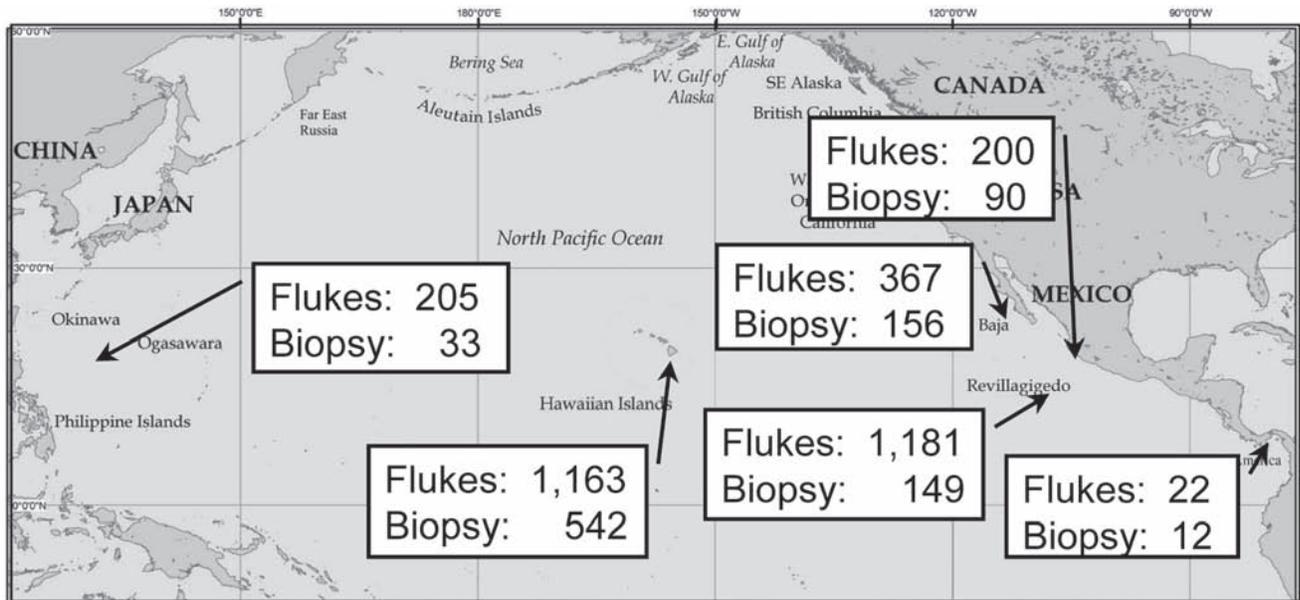


Figure 3. SPLASH program winter 2004 cruises. Figure courtesy of the National Marine Fisheries Service.

develop and coordinate a stranding response network in the main Hawaiian Islands. Those efforts have had mixed success. Successful response efforts have generally been due to the dedicated efforts of individual volunteers rather than an effective, coordinated response strategy.

At the Marine Mammal Commission's 2004 annual meeting, the state of stranding response in Hawaii was discussed in detail. Indications are that response efforts are becoming more organized and coordinated and more effective in promoting animal welfare and collection of information on stranded animals. These improvements appear to be due to two important efforts. First, staff of the Hawaiian Islands Humpback Whale National Marine Sanctuary are now responding to entangled humpback whales. Such responses require skilled personnel, equipment, funding, and cooperation among a number of agencies. In many respects, responses to entangled whales are similar to responses to stranded marine mammals, and the benefits derived from these efforts are likely to extend to other marine mammals.

Second, the Hawaiian Islands Stranding Response Group was formed as a nonprofit organization of volunteers in 2002, and this group is leading stranding responses throughout the main Hawaiian Islands. The group's priorities include (from most to least important) protecting human health and safety, protecting wild populations, enhancing individual

animal welfare, and collecting and disseminating scientific information derived from stranding events.

At the Commission's meeting, a leader and representative of the Hawaiian Islands Stranding Response Group attributed the success of recent response efforts to contributions from a range of federal, state, local, and private organizations. Federal cooperators include the National Marine Sanctuary Program, the Kaneohe Marine Corps Base, the National Marine Fisheries Service, and the U.S. Coast Guard. State contributors include the University of Hawaii's Marine Mammal Research Program and Sea Grant Program, the Hawaii Institute of Marine Biology, and the Department of Land and Natural Resources (including the Division of Aquatic Resources and the Division of Conservation and Resource Enforcement). Local cooperators have included the fire, police, and public works departments and the Civil Air Patrol. In addition, various private organizations such as Dolphin Quest have contributed significantly to stranding responses.

A stable and adequate funding base for stranding responses has not yet been established, but the Hawaiian Islands Stranding Response Group has received some grants from the Prescott Marine Mammal Health and Stranding Response Program. Individual members of the group have provided additional funds, totaling tens of thousands of dollars. The two key factors in maintaining the group and its efforts to

enhance stranding responses in the main Hawaiian Islands appear to be the establishment of consistent, reliable funding and continued collaboration of a range of agencies, organizations, and individuals dedicated to this purpose. In view of the difficulty of studying marine mammals around the Hawaiian archipelago, an effective stranding response effort seems essential to take advantage of the limited opportunities to collect important data on the different species and stocks present in the Pacific Islands Region, their natural history, and their interactions with human activities. At the end of 2004 the Marine Mammal Commission was preparing letters to the National Marine Fisheries Service, the National Marine Sanctuary Program, and the State of Hawaii to recommend that they facilitate continued development of a coordinated network for responding to strandings and entanglement of humpback whales and other marine mammals.

## **Hawaiian Monk Seal Research and Management**

The Hawaiian monk seal is the most endangered species of seal in U.S. waters and breeds only in the Hawaiian archipelago. More than 90 percent of all monk seals are born at six major breeding colonies located at small, isolated islands and atolls in the remote Northwestern Hawaiian Islands (i.e., French Frigate Shoals, Laysan Island, Lisianski Island, Pearl and Hermes Reef, Midway Atoll, and Kure Atoll). Since the late 1950s when monk seals were first counted, their abundance has declined by nearly two-thirds. Causes of the decline are thought to involve both human and natural factors that have changed over time and differ by colony. Human disturbance at haul-out beaches by military personnel and their dogs was likely a major cause of declines at several atolls before the late 1970s. Sources of human disturbance were reduced in the 1970s and early 1980s. Since then, the decline has slowed. The reasons for the continued decline probably involve a combination of factors including entanglement in derelict fishing gear, depletion of prey resources by commercial fishing, natural oceanographic changes, shark predation, deaths from naturally occurring biotoxins, and deaths and injuries to pups, juveniles, and adult seals due to aggressive behavior by some adult male seals.

During its 2004 annual meeting, the Marine Mammal Commission and its Committee of Scien-

tific Advisors reviewed information on the status of the monk seal population and ongoing research and management activities. The National Marine Fisheries Service has lead responsibility for monk seal recovery but is assisted by other agencies and groups including the Fish and Wildlife Service, the National Marine Sanctuary Program, the State of Hawaii Division of Aquatic Resources, county officials, and various nongovernmental entities such as the volunteer Kauai Monk Seal Watch Program.

Preliminary research findings for 2004 suggested that, for the first time in five years, there was a slight increase in aggregate monk seal beach counts in the Northwestern Hawaiian Islands (Fig 4). This was accompanied by a slight increase in pup production at all major breeding colonies and increases in survival rates of seals up to two years of age at most colonies. Nevertheless, even with the increases in juvenile survival, survival rates remained low at several sites, particularly Midway Atoll and Kure Atoll where less than 40 percent of pups born in 2003 survived to age one and less than 30 percent of pups born in 2002 survived to age two.

As noted in past annual reports, monk seal numbers appear to be increasing in the main Hawaiian Islands where only two births had been recorded before 1991. Excluding Niihau, a privately owned island from which information on monk seals is very limited, the number of births reported in the main Hawaiian Islands has increased from an average of 3.4 births per year between 1996 and 2000 to 7.8 per year from 2001 through 2004. In 2004, 10 births were reported in the main Hawaiian Islands, including five on Molokai.

## **Research and Management Activities in the Northwestern Hawaiian Islands**

The National Marine Fisheries Service's Pacific Islands Fisheries Science Center carries out most Hawaiian monk seal research and monitoring in the Northwestern Hawaiian Islands. Field teams visit each of six major breeding colonies annually. During those visits, the teams study population abundance, reproduction, survival, behavior, and factors affecting the seals. They also study particular issues of concern, such as factors that may be causing the sharp decline of the species' largest breeding colony, located at French Frigate Shoals. The latter research includes telemetry studies to identify at-sea foraging areas and studies to identify monk seal prey species and prey prefer-

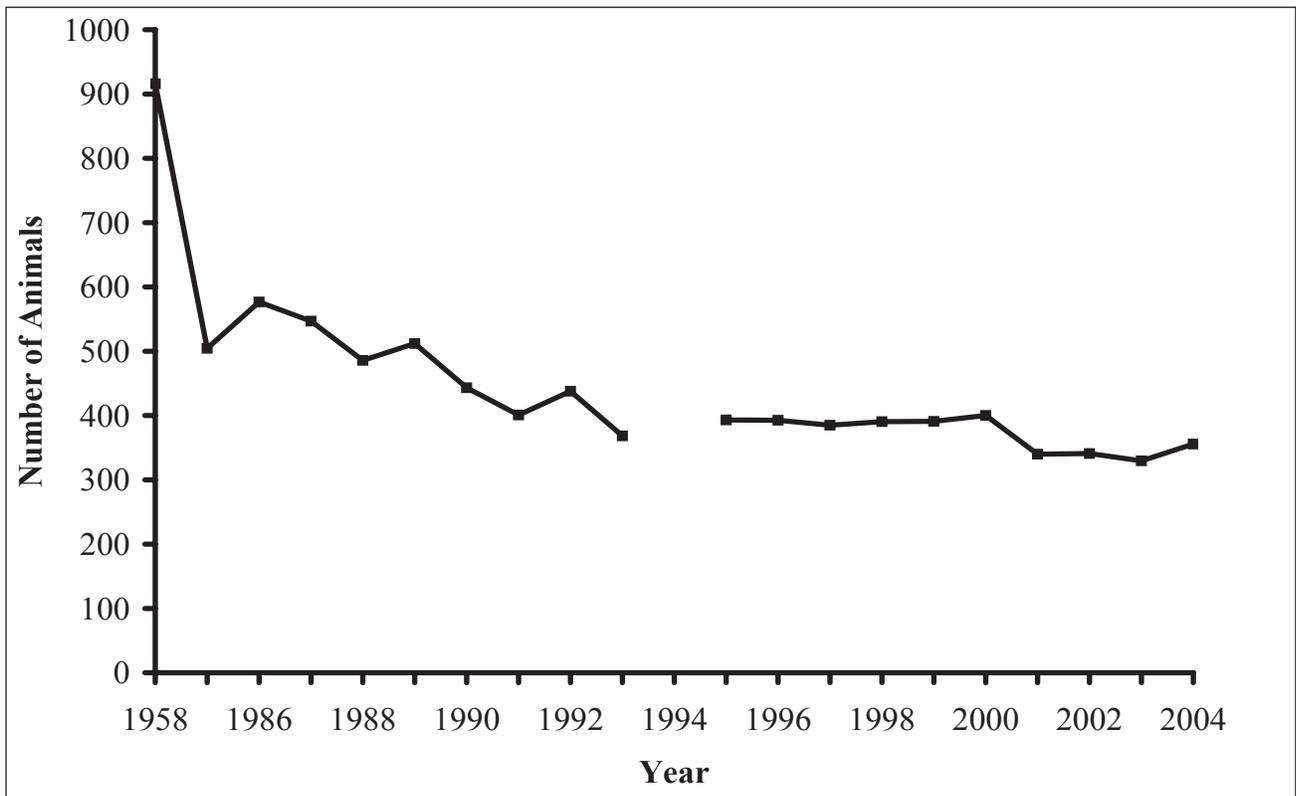


Figure 4. Hawaiian monk seal (non-pups) status, 1958–2004. Data courtesy of the National Marine Fisheries Service.

ences. In addition, staff conduct a number of management-related activities, including disentangling seals caught in derelict fishing gear, removing entangling debris from beaches, identifying and either killing or harassing predatory sharks patrolling major pupping beaches, and identifying and translocating adult male monk seals known to attack pups, juveniles, and adult females. The Center received \$2.25 million for fiscal year 2004 for research and mitigation activities in both the Northwestern and main Hawaiian Islands, most of which was used to support work in the Northwestern Hawaiian Islands.

In 2004, 15 seals were observed entangled, 11 were disentangled, three escaped the debris unaided, and one was still entangled when last seen. These numbers are comparable with entanglement levels in recent years but are substantially lower than in 1999 when a record 25 seals were seen entangled. Efforts initiated in 2000 to catch and kill sharks at Trig Island in French Frigate Shoals also were continued. Shark predation on monk seals had increased sharply in the mid-1990s, a problem thought to be caused by a few individual Galapagos sharks that apparently had learned to catch pups swimming near pupping beaches (Fig. 5). Since 2000, 10 sharks have been caught,

principally at Trig Island, but none in 2004. Since this effort began, the number of known or suspected pup deaths due to sharks at French Frigate Shoals decreased from an average of 24 per year between 1996 and 1999 to an average of 10.4 per year since 2000, including 10 in 2004. In recent years, however, shark predation reports have increased at other islands in the atoll, and in 2004 shark predation also occurred at Midway Atoll, Pearl and Hermes Reef, and Kure Atoll, where such deaths previously were considered rare. In 2004 the number of injuries and deaths due to aggressive adult male monk seals was low at all sites, and no action was considered necessary or was taken to relocate any adult males.

Based on presentations at its 2004 annual meeting, the Commission concluded that the Center's studies to assess monk seal colonies in the Northwestern Hawaiian Islands were well organized and are providing important information necessary to identify needed recovery actions. At the end of 2004 the Commission was in the process of writing to the director of the Pacific Islands Fisheries Science Center to recommend that existing levels of funding and support for monk seal work in the Northwestern Hawaiian Islands be maintained. It was also considering



Figure 5. Galapagos sharks and Hawaiian monk seals at Trig Island. Photo courtesy of the National Marine Fisheries Service.

recommendations on the need to increase efforts to assess the abundance, behavior, and movements of Galapagos sharks in the Northwestern Hawaiian Islands and was examining a growing problem related to the loss of suitable haul-out and pupping habitat due to beach erosion. As discussed in the following section, the Commission provided related recommendations to these and other agencies on the need for improved protection and cooperative management of natural resources within the Northwestern Hawaiian Islands marine ecosystem.

### Research and Management Activities in the Main Hawaiian Islands

The main Hawaiian Islands are the only habitat largely unoccupied by monk seals within their current range. Recent increases in monk seal sightings and births in this area, which have been most apparent on the island of Kauai, therefore represent an encouraging prospect for the species' recovery. However, monk seals need to haul out on beaches to rest, pup, and molt and to forage in nearshore waters. These behaviors have increased the frequency of interactions with recreational beachgoers, swimmers, and divers and with both recreational and commercial fishermen. They also have increased the risk of interactions with dogs and feral animals that could introduce diseases normally not occurring in the Northwestern Hawaiian Islands.

The increasing occurrence of seals in the main Hawaiian Islands has fostered both interest and concern among residents and local businesses, particularly on Kauai. In response, residents there formed a volunteer response network, the Kauai Monk Seal Watch Program, to help protect seals and minimize

interactions with people. In cooperation with the Service and state and local officials, participants in the program respond to incidents of hauled-out monk seals by posting temporary perimeters around animals and distributing information on the need to avoid disturbing them. Given the limited staff of both the Service and the State of Hawaii, such efforts provide an important first line of protection for seals that haul out in publicly accessible areas.

As noted in previous annual reports, the Commission, in cooperation with the Service and the Hawaii Division of Aquatic Resources, convened a workshop on Kauai in October 2002 to assess management needs for monk seals in the main Hawaiian Islands and to help organize related research and management efforts. Based on results of the workshop, the Commission wrote to the National Marine Fisheries Service and the Hawaii Department of Land and Natural Resources early in 2003 recommending follow-up actions. Among other things, the Commission encouraged the State to (1) increase and formalize its involvement in monk seal response efforts by developing a cooperative agreement with the Service under section 6 of the Endangered Species Act, (2) in cooperation with the Service, hire a full-time monk seal response coordinator for Kauai to work with local volunteers, and (3) serve as co-chair with the Service on a new task force to oversee monk seal management activities in the main Hawaiian Islands.

In its letter to the Service, the Commission recommended that the Service encourage the State to develop a cooperative agreement and grant application under section 6 of the Endangered Species Act to help manage monk seals and other protected species. It also recommended that funding for the Service's

Regional Office be increased to (1) support at least one additional staff member to coordinate and oversee monk seal management work in the main Hawaiian Islands, (2) provide operational funds for travel, meetings, equipment, and other costs associated with management needs, (3) help the State hire a Kauai monk seal response coordinator, and (4) enable the Pacific Islands Fisheries Science Center to expand its monk seal research and monitoring work in the main Hawaiian Islands.

To follow up on workshop recommendations in 2003, the Commission also hired an interim monk seal response coordinator for Kauai for the summer of 2003 and transferred funds to the National Marine Fisheries Service to help develop monk seal response and monitoring networks on islands other than Kauai.

During its October 2004 meeting, the Commission was advised that the Hawaii Division of Aquatic Resources was taking steps to increase its monk seal protection activities and had begun developing a cooperative agreement with the Service pursuant to section 6 of the Endangered Species Act. With funding provided by the Service, early in 2004 the Division had hired a temporary monk seal response coordinator for Kauai and expects to hire a permanent coordinator early in 2005. Both the Service and the State had continued to work with volunteers and local officials to manage interactions between seals and the public. The Service had hired two additional staff members in its new Pacific Islands Regional Office to work on monk seal and other protected species issues. The Service also planned to hire additional staff for this purpose in 2005. With regard to funds that the Commission had provided the Service to help expand voluntary response efforts, the Commission was told that, due to accounting problems within the Service, those funds had not yet been used, but that they would be applied to the intended purpose as soon as possible.

At the Commission's meeting, representatives of the Service described three recent monk seal cases that required intensive management efforts. In one case, a seal on Kauai that had swallowed a fishing hook was captured so that the hook could be surgically removed from its throat. The surgery was successful, and the seal was subsequently released back into the wild on Kauai. In the second case, a young male seal was behaving aggressively toward swimmers on the island of Hawaii. Twice the animal was cap-

tured and moved to different locations farther away from people. The seal moved back to areas used by swimmers and exhibited the same behavior. It therefore was relocated to Johnston Atoll, about 800 miles southwest of the main Hawaiian Islands. In the third case, a seal that had been repeatedly fed by people in Port Allen and Nawiliwili Harbor on Kauai was found dead. A necropsy suggested that the animal had died of toxoplasmosis, a disease commonly transmitted through cat feces. Regular feeding of the animal may have caused it to stay in the harbor where risk of exposure to the disease may have been high.

Based on information gained at its annual meeting on monk seal protection work in the main Hawaiian Islands, the Commission began developing a series of letters to involved agencies that it expected to send early in 2005. The Commission found the State's efforts to develop a cooperative agreement with the Service and to hire a monk seal response coordinator for Kauai both encouraging and gratifying. At the end of 2004 the Commission was preparing a letter to the State of Hawaii commending its efforts to develop a cooperative agreement with the Service and urging the State to seek a grant from the Service to help expand its monk seal management work and fund the permanent response coordinator position for Kauai.

At the end of 2004 the Commission also was considering letters to various offices within the National Marine Fisheries Service recommending that they pursue the following:

- work with the State of Hawaii to complete a cooperative agreement for managing monk seals and other protected species under section 6 of the Endangered Species Act as soon as possible
- continue to fund State efforts to support the Kauai monk seal response coordinator pending the development of a grant under section 6
- develop a tiered system for guiding and authorizing different levels of response (e.g., posting seal protection zones, herding seals away from danger, and capturing seals in distress) by volunteers and other agency partners, as suggested at the October 2002 workshop
- provide additional funding and support to expand efforts to study and monitor monk seals in the main Hawaiian Islands and determine movement patterns and prey preferences.

In light of the increasing number of monk seals in the main Hawaiian Islands and the efforts required

to assure their protection, the Commission also was considering a recommendation to the National Ocean Service that it expand the scope of the Hawaiian Islands Humpback Whale National Marine Sanctuary to include protection of monk seals and other prominent marine species in the main Hawaiian Islands.

### **Hawaiian Monk Seal Recovery Plan**

In 2001 the National Marine Fisheries Service initiated steps to update the Hawaiian Monk Seal Recovery Plan that had been in place since 1983. To do so, it reconstituted the Hawaiian Monk Seal Recovery Team and charged it with developing a revised draft plan. The team met several times in 2002 and 2003, and in 2004 it made substantial progress to complete a draft revision. Immediately following the Marine Mammal Commission's annual meeting in October, the team met to review a final draft document, which it expected to provide to the Service early in 2005. The revised draft provides guidance on a number of issues not addressed in the previous plan, including the management of monk seals in the main Hawaiian Islands. It identifies new research and management priorities based on information obtained and progress made since the plan was initially prepared. At the Commission's annual meeting, the Service stated that it expected to circulate the draft plan for public and agency review in spring 2005.

## **Sanctuaries, Reserves, and Refuges**

The Pacific Islands Region includes a range of marine ecosystems that are vulnerable to the adverse effects of human activities, require additional protection to ensure their conservation, and provide important opportunities to study and understand tropical and subtropical marine ecology and ecosystems. To date, most of the protective measures in the region have been focused on the Hawaiian archipelago, as evidenced by the number of sanctuaries, reserves, and refuges there. The archipelago is generally divided into two regions: the main Hawaiian Islands, which have been inhabited by humans for about 2,000 years, and the remote, largely uninhabited Northwestern Hawaiian Islands, which have been known to Native Hawaiians for centuries but were discovered only re-

cently (late 1700s) by Westerners (Fig. 6). The main Hawaiian Islands and surrounding waters are relatively well known, have been heavily exploited, and require extensive, multipurpose management.

In contrast, the Northwestern Hawaiian Islands are less well known and, although they have been exploited, still include biological communities and ecosystems that are largely intact. The Northwestern Hawaiian Islands are a chain of small isolated islands, atolls, and rocky pinnacles stretching more than 1,200 miles to the northwest of the main islands and ranging in size from less than an acre to nearly two square miles. They provide nesting habitat for the world's largest colonies of several seabirds and sea turtle species and pupping beaches for all of the major breeding colonies of Hawaiian monk seals. The surrounding waters support the world's northernmost tropical coral reef system as well as a number of deep-water coral reefs. Since their discovery, the islands and atolls have sustained various forms of human impact including seal, sea turtle, and seabird hunting, episodes of human occupation, and the introduction of exotic species. The surrounding marine areas also have been affected by commercial fishing for finfish and shellfish (principally during the past 25 years), shipwrecks, small oil spills, and, at some locations, channel dredging and waste disposal. Nevertheless, the Northwestern Hawaiian Islands and surrounding waters constitute one of the least disturbed coral reef ecosystems in the world.

The following sections describe the major sanctuaries, reserves, and refuges in the Hawaiian archipelago and issues pertaining to their role as important marine mammal habitat.

### **Hawaiian Islands Humpback Whale National Marine Sanctuary**

At the Marine Mammal Commission's 2004 annual meeting, staff from the Hawaiian Islands Humpback Whale National Marine Sanctuary provided an overview of general issues affecting research and management of humpback whales and other marine mammals in the sanctuary. The ensuing discussion focused on (1) the extent to which species other than humpback whales should be granted further protection under the sanctuary, (2) the need for criteria and review procedures to determine what human activi-

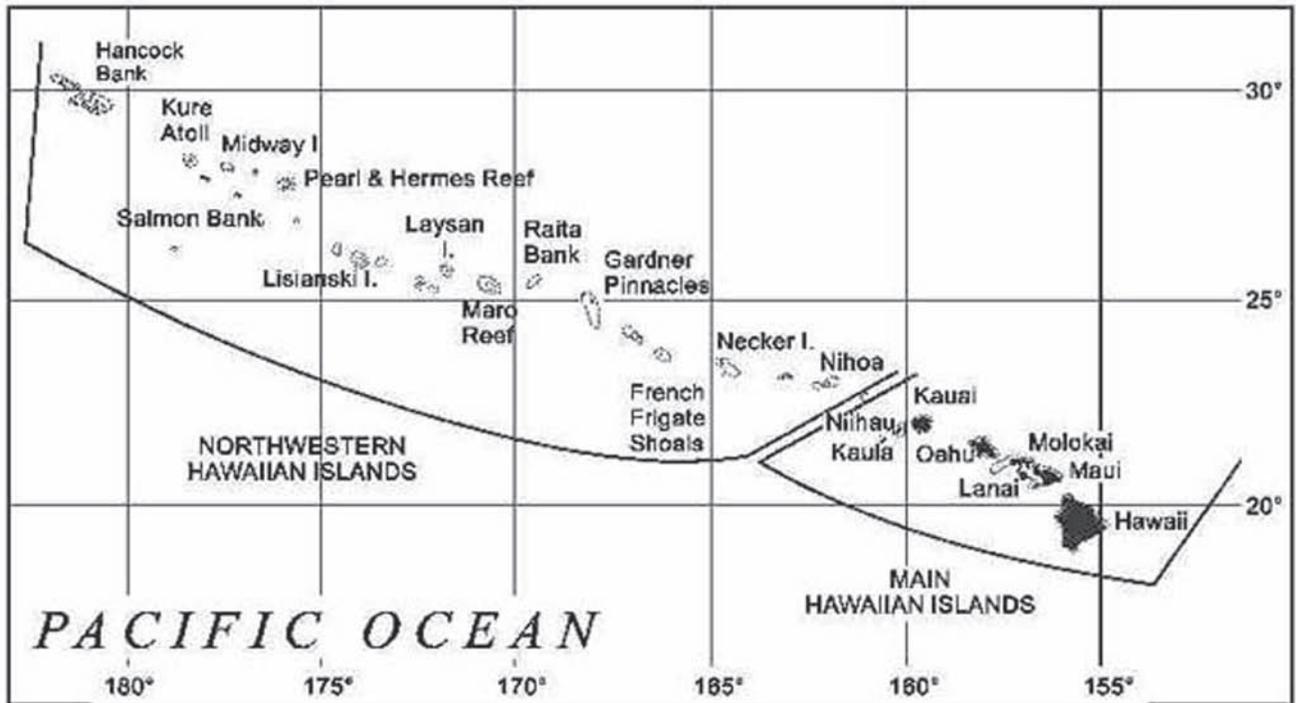


Figure 6. Map of the main Hawaiian Islands and the Northwestern Hawaiian Islands. Figure courtesy of NOAA's National Ocean Service.

ties are appropriate within sanctuary waters, and (3) efforts to develop a more effective response to entangled and stranded humpback whales.

A number of species could benefit from additional protection provided by the existing sanctuary. The Hawaiian monk seal population is increasing in the main Hawaiian Islands, and its occupation of those islands may be essential to the species' survival in light of the declining trends and lack of recovery at important monk seal sites in the Northwestern Hawaiian Islands. Spinner dolphins could also benefit from additional protection of areas essential to them for foraging, resting, and nursing. In addition, sea turtles that are listed under the Endangered Species Act occur commonly in the waters and on some beaches around the main Hawaiian Islands. In view of the growing emphasis on ecosystem-based management of marine resources over the past decade, extension of the sanctuary's scope to include these species seems reasonable and warranted. Based on the discussion of this topic at its annual meeting, the Commission was considering a recommendation to the National Ocean Service to expand the sanctuary's scope accordingly.

The discussion regarding determination of appropriate activities within sanctuary waters focused on aquaculture ventures, the initiation of high-speed

ferry service in the main Hawaiian Islands (including some areas within the sanctuary), and human activities that are increasing the level of noise in the marine environment within the sanctuary. The introduction and management of aquaculture ventures in or near the sanctuary raise a number of concerns including (1) the potential for animals (e.g., whales, dolphins, seals, sea turtles, seabirds) to become entangled in nets, (2) the potential for interactions between marine mammals and aquaculture operations, and (3) the introduction of disease, contaminants, and nutrients, the latter of which could lead to harmful algal blooms. Management authority for such operations does not appear to be sufficiently well defined to ensure the integrity of the sanctuary waters and suitable protection of marine mammals within the sanctuary. In view of the apparent lack of a management framework, at the end of 2004 the Commission was developing recommendations to the National Marine Sanctuary Program to establish a mechanism for evaluating activities proposed for the sanctuary and to the National Marine Fisheries Service to establish a management framework for aquaculture management, with particular attention to protected areas such as sanctuaries.

The discussion regarding the initiation of high-speed ferry service into the main Hawaiian Islands

focused on the service that would be provided, the associated risks, and mechanisms to evaluate and mitigate those risks to ensure that they do not result in unacceptable adverse effects on protected species, both within the sanctuary and in other regions where the ferries will operate. The ferry service will run among four islands: Kauai, Oahu, Maui, and Hawaii. It will use large (340-foot) catamarans traveling at speeds up to 45 miles per hour. The proposed ferry service would pose risks to protected species throughout the islands. In particular, the proposed route from Oahu to Maui will include the four-island area that is an important calving and nursing ground for humpback whales. With these risks in mind, the Commission's discussions focused on the need for appropriate assessment of those risks under both the National Environmental Policy Act (environmental assessment or environmental impact statement) and the Endangered Species Act (section 7 consultation). During the discussion, National Marine Fisheries Service staff indicated that the nexus for a section 7 consultation was not clear and, at least at that time, no such consultation was planned. At the end of 2004 the Commission was preparing a letter to the Service recommending full and complete analysis of the ferry service under applicable statutes.

### **Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve**

The Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve was created by Presidential Executive Order in December 2000. The reserve includes most federal waters from the three-mile limit of State jurisdiction out to 50 nmi around all emergent lands and submerged reefs. The purpose of the reserve is to ensure the long-term conservation of the coral reef ecosystem and related marine resources in their natural state. The order directs that reserve management follow a precautionary approach wherein resource protection is favored when there is a lack of information regarding the effects of any activity. In January 2001 a second Executive Order was signed restricting catch levels and fishing effort to those that were in effect in the year prior to designation and establishing reserve preservation areas in which all commercial and recreational fishing is prohibited.

The Executive Orders also directed the National Marine Sanctuary Program to establish a Reserve Advisory Council and, in consultation with that Council, to consider designating the reserve as a national ma-

rine sanctuary. The Executive Orders stipulate that if a sanctuary is created, its management measures must "supplement or complement" measures established in the orders. The National Marine Sanctuary Program established a 25-member Reserve Advisory Council with 15 voting members and 10 nonvoting members, including a representative of the Marine Mammal Commission. It also began developing a reserve operations plan and a sanctuary designation proposal. As discussed later, in 2004 Sanctuary Program staff and the Council took steps to complete a reserve operations plan and to begin drafting a proposal to convert the reserve into a national marine sanctuary.

**Reserve Operations Plan**—The purpose of the reserve operations plan is to guide management decisions pending action to designate the area as a national marine sanctuary. The Marine Mammal Commission commented to the National Marine Sanctuary Program on an initial draft reserve operations plan in 2002. In light of those and other comments received on the draft plan, including detailed comments from the Reserve Advisory Council, the draft plan was not finalized in 2003. Instead, on 19 March 2004 the Sanctuary Program requested comments on a substantially revised draft final plan.

By letter of 14 May 2004 the Commission responded to the Sanctuary Program's request, noting that a Commission representative had participated in the Reserve Advisory Council's efforts to recommend revisions to the draft operations plan and that it endorsed all the changes recommended by the Council. In this regard, the Commission noted that the Executive Order restrictions did not have any penalties associated with them and that, to make the measures enforceable, high priority should be assigned to the development of conforming regulations and a specific penalty schedule. The Commission also recommended that the plan be changed to clarify the need for permit requirements, rather than guidelines, for controlling and monitoring access to the reserve, and that it include an action plan describing the regional fisheries and steps that would be taken to manage them within the context of Executive Order restrictions.

On 15 October 2004 the Sanctuary Program published a *Federal Register* notice announcing availability of the final reserve operations plan. In its notice, the Sanctuary Program advised that it would not pursue the development of regulations for the reserve because it was focusing on steps to designate the area as a national marine sanctuary and that its preferred

sanctuary designation alternative would include proposed regulations. It also reiterated a previously expressed view that there was no need for regulations or a penalty schedule because the Executive Order restrictions were “self executing.” The Sanctuary Program also decided that mandatory permit requirements for reserve access were not necessary because they were not specified in the Executive Orders establishing the reserve. With regard to describing the regional fisheries and steps needed to manage them, the notice indicated that the environmental impact statement for the proposed sanctuary would include a description of regional fisheries and consider fishery management issues.

**Sanctuary Designation Proposal**—The Executive Orders establishing the reserve require that the Sanctuary Program consult with the Reserve Advisory Council when developing a proposal to convert the area to a marine sanctuary. The most controversial aspects of the reserve and its conversion to a marine sanctuary have involved restrictions on fishing activity. Section 304(a)(5) of the National Marine Sanctuary Act requires that regional fishery management councils (the Western Pacific Fishery Management Council in this case) be provided an opportunity to draft proposed fishing regulations for sanctuary proposals. The section provides the relevant council 120 days to draft regulations, starting at the time it receives a request to do so from the Sanctuary Program Office. If the fishery council chooses to draft regulations, they are to be included as part of the sanctuary proposal, provided that they are consistent with the policies of the Act and the goals and objectives identified for the proposed sanctuary by the Sanctuary Program.

During 2004 a representative of the Commission participated in several Reserve Advisory Council meetings at which advice on fishery-related goals and objectives for the proposed sanctuary was developed. The Advisory Council finalized its advice to the Sanctuary Program on this matter during a 7–8 July meeting. Its recommendations called for regulations that were consistent with, and in some cases more restrictive than, measures set forth in the Executive Orders. In part, it recommended that sanctuary regulations seek to prohibit commercial fishing for lobsters and precious corals and to phase out commercial bottomfish fishing within one year of designation. The Advisory Council also recommended the following sanctuary goals and objectives:

- prohibiting commercial fishing for pelagic species (e.g., tuna, billfish, and mahimahi) except by trolling, pole and line, and handline, to be allowed at levels that occurred in the year prior to reserve designation and subject to reporting
- prohibiting commercial fishing for the aquarium and live fish trade and for nonprecious coral, live rock, algae, sponges, and other invertebrates
- allowing recreational fishing subject to a cap set at levels that occur in the first year after sanctuary designation, subject to bag and size limits, time-area closures, catch and release requirements, and permit and reporting measures as may be appropriate
- allowing sustenance fishing (i.e., the catch of fish for consumption while in the sanctuary) subject to permit and reporting requirements
- allowing noncommercial catches by Native Hawaiians for subsistence, cultural, and religious purposes subject to permitting and catch reporting requirements

On 9 August 2004 the Marine Mammal Commission wrote to the National Oceanic and Atmospheric Administration endorsing the Advisory Council’s recommendations and expressing its views as to what should be included in the sanctuary program’s guidance to the Western Pacific Fishery Management Council. In doing so, the Commission noted that, although some recommendations called for complete and indefinite closure of some fisheries, it did not necessarily believe that all prohibited fisheries would need to remain closed forever because sanctuary management procedures call for reexamining management plan provisions at five-year intervals. At those intervals, fishery measures might be modified, provided they were consistent with established precautionary, ecosystem-based management principles, new information on the status and ecology of affected species, and an appropriately placed burden of proof.

After considering advice from the Reserve Advisory Council and others, the National Oceanic and Atmospheric Administration, through the Sanctuary Program, provided the Western Pacific Fishery Management Council a report on 20 September 2004 setting forth fishery-related goals and objectives for the proposed sanctuary. At the request of the Fishery Management Council, the document suggested a range of alternatives to be considered, including a no-action alternative, a preferred alternative, an alternative recommended by the Fishery Management

Council that relied on existing fishery management plans, the Reserve Advisory Council's recommendation, and one other alternative. The specific goals and objectives for fishing were similar to those developed by the Reserve Advisory Council, with the exception that they allowed continued bottomfish fishing in areas of the reserve not considered to be "sensitive habitat." Perhaps more significantly, all of the specific fishery-related goals were prefaced by a statement calling for fisheries to be managed "as appropriate to maintain the natural character or biological integrity of any ecosystem within the region." The meaning of this statement was not explained in the document.

At the Commission's annual meeting, a representative of the Western Pacific Fishery Management Council discussed the process the council uses to amend fishery management plans—a process that, in his view, was necessary to change existing plans to address a new sanctuary.

At the end of 2004 the Western Pacific Fishery Management Council was in the process of drafting proposed regulations and soliciting public comments on what they should include. Contrary to advice in the Sanctuary Program's document regarding alternatives to be considered, the council was taking steps to develop a new set of alternatives, most of which could allow lobster and precious coral fishing to occur within the proposed sanctuary.

### **State of Hawaii Northwestern Hawaiian Islands Marine Refuge**

In 2001 the Division of Aquatic Resources in the Hawaii Department of Land and Natural Resources proposed regulations to designate all state waters in the Northwestern Hawaiian Islands (i.e., most waters from the shoreline of Kure Atoll and the boundary of the Hawaiian Islands National Wildlife Refuge out to the three-mile limit of state jurisdiction) as a fishery management area to provide a basis for protecting the area's marine life from impacts of fishing and other activities. The proposal sought to ensure sustainable use of living resources and would have required a state permit to take any living resources from state waters in the Northwestern Hawaiian Islands. The Commission commented in support of the proposal on 30 January 2002 but also recommended that measures be incorporated to require a precautionary management approach that would complement measures established for the adjacent Northwestern Hawaiian

Islands Coral Reef Ecosystem Reserve and the potential national marine sanctuary.

Based on comments from the Commission and others urging that the regulations include more explicit protection measures, the Division of Aquatic Resources withdrew the proposal and began developing a new proposal to designate the area as a state marine refuge. Proposed regulations to do so were circulated for comment in the spring of 2004. The stated purpose of the marine refuge is to ensure the long-term conservation and protection of the area's unique coral reef ecosystems and related marine resources using the best available science and a precautionary management approach. The new proposal also includes provisions whose intent appears to be prohibiting commercial and recreational fishing in most refuge waters. Certain other activities involving the removal of resources, such as Native Hawaiian subsistence and cultural activities, would be allowed conditionally and subject to a new permit requirement.

On 5 August 2004 the Commission commented to the State, noting that the revised proposal squarely addressed its comments on the earlier proposal and that the strong level of protection for state waters would complement protection of adjacent areas in the region's two national wildlife refuges and the Coral Reef Ecosystem Reserve. With regard to new measures establishing no-take areas within the State's proposed refuge, the Commission suggested closing a loophole that could be used to authorize fishing activity in those areas. It also recommended various technical changes, including language to ensure that the removal of marine life within no-take areas could be authorized when necessary for management purposes (such as translocating Hawaiian monk seals) subject to permit requirements. Because of possible effects of fishing activity on Hawaiian monk seals at Nihoa Island, the Commission also recommended expanding the boundary of a no-take zone around that island to a uniform one mile distance instead of the 10-fathom contour that approaches to within 30 meters of the shoreline at some points.

### **The Hawaiian Islands National Wildlife Refuge**

The Hawaiian Islands National Wildlife Refuge, established in 1909, includes certain nearshore waters and all of the Northwestern Hawaiian Islands atoll islands between Pearl and Hermes Reef and Necker Is-

land. Two issues of particular concern to the Commission with regard to this refuge have involved the need to repair a crumbling seawall at Tern Island (Fig. 7) in French Frigate Shoals and to clean up contaminants in an old Coast Guard dump site on that island.

Tern Island is a largely manmade island that includes an airstrip built by the Navy before World War II and several buildings now used as a field station by the Fish and Wildlife Service. The island's airstrip, protected by a sheet-metal bulkhead that has been rusting away over the past several decades, provides an important means of access to the atoll for research and management purposes. Erosion pockets behind the decaying bulkhead have become an entrapment hazard for both monk seals and sea turtles. Because French Frigate Shoals supports the largest monk seal colony, and because monk seal numbers at this atoll have declined sharply over the past 15 years, the logistical facilities at Tern Island have been particularly important for facilitating monk seal recovery work.

Efforts to plan and secure funding to replace the Tern Island seawall have been ongoing for more than 15 years. During the Commission's 2004 annual meeting, representatives of the Fish and Wildlife Service advised that work was successfully completed in the summer of 2004 to replace the most badly deteriorated portions of the seawall. The cost of this work was about \$9 million. Currently, there is no funding to replace the remaining portions of the original seawall, a task likely to cost an additional \$10 million.

**Tern Island Contaminant Cleanup**—Before becoming a refuge field station, Tern Island was used by the U.S. Coast Guard for a loran station. The Coast Guard buried old electrical equipment and other



Figure 7. Aerial photo of Tern Island. Photo courtesy of the National Marine Fisheries Service.

wastes in a landfill on the island. The location of the dump was subsequently forgotten until 2000, when it was exposed by erosion from a breach in the seawall. The Coast Guard quickly responded with a cleanup effort in 2001. However, the extent of contaminated soil was larger than estimated, and the entire site was not cleaned or sampled to agreed standards established by the Environmental Protection Agency. The Fish and Wildlife Service and the Commission have written to the Coast Guard urging that the cleanup be completed, but the Coast Guard has declined to do so, asserting that the benefit to wildlife was not worth the expense, which would likely exceed \$1 million.

During its 2004 annual meeting, the Commission was advised by representatives of the Service that it was not aware of any plans by the Coast Guard for additional cleanup work at Tern Island. At the end of 2004 the Commission was developing a letter to the Coast Guard, again recommending that it secure the funds necessary to complete the cleanup of remaining contaminants at Tern Island to the standards agreed upon with the Environmental Protection Agency and the Service.

### The Midway Atoll National Wildlife Refuge

As recently as the 1950s Midway Atoll (Fig. 8) was a major pupping colony for Hawaiian monk seals. Beach counts at that time were as high as 68 seals. After the Navy expanded access to East Island (the second largest of the Midway islands and the site where most pupping occurred) in the 1950s, monk seal abundance at the atoll fell sharply to nearly zero. After the Navy took steps in the 1990s to close the station and transfer ownership to the Fish and Wildlife Service, monk seals began to return. In 2004 the mean beach count was about 25 animals and 17 pups were born at the atoll.

Although the atoll is now managed as a wildlife refuge, Congress has required that the Service maintain the islands' airfield as an emergency landing strip for trans-Pacific air traffic. The Federal Aviation Administration has determined that the facility must meet standards equivalent to those of major commercial airports. Dedicated funding to meet these standards and maintain the airfield, however, has not been provided to the Service. Initially, this need was met by a concessionaire as part of an agreement with the Service allowing it to operate a refuge visitation program. That program, however, proved unprofitable, and the concessionaire terminated the agreement,



Figure 8. Aerial photo of Midway Atoll. Photo courtesy of the National Marine Fisheries Service.

leaving the Service with responsibility for airfield operation and maintenance costs, which have exceeded \$1 million annually in recent years.

Before 2004 the National Marine Fisheries Service visited the atoll at minimal cost to monitor monk seal recovery and carry out related management actions. In 2004, however, the Fish and Wildlife Service announced that it would begin charging fees to any agency or private group visiting the atoll to help cover the costs of maintaining the airfield and related facilities. To visit Midway and conduct monk seal research in 2004, the Fish and Wildlife Service charged the National Marine Fisheries Service more than \$30,000.

During the Marine Mammal Commission's 2004 annual meeting, representatives of the Fish and Wildlife Service described the rationale for user fees it was charging to maintain the airfield. Although the Marine Mammal Commission appreciated the Service's predicament with regard to maintenance of the airfield, the Commission concluded that it was inappropriate and counterproductive for the Service to charge fees for carrying out research and management actions undertaken for the recovery of a species that the refuge was established to help protect. At the end of 2004 the Commission was developing a letter to the Fish and Wildlife Service recommending that it eliminate the new fees it was charging to conduct monk seal work at Midway. In addition, the Commission was developing a letter to the Secretary of Transportation recommending that the Department of Transportation provide the Fish and Wildlife Service the funding necessary to improve and operate the airfield on Midway at required standards.

## Management of the Pacific Islands Region in an Ecosystem Context

In 2003 and 2004 the Pew Commission on Ocean Policy and the President's Commission on Ocean Policy released independent reports on the state of the nation's marine resources and their management. Both reports called for a transition to ecosystem-based management to better understand and moderate the impact of human activities on the marine environment. In the U.S. Ocean Action Plan, the Bush Administration concurred, stating that, "The Administration will continue to work towards an ecosystem-based approach in making decisions related to water, land, and resource management." These are but a few examples of the many calls for ecosystem-oriented approaches to natural resource management. Nonetheless, in spite of the increasing demand for and value placed in ecosystem-based management, the concept remains relatively vague and its implementation has been relatively slow.

### Defining Ecosystem-Based Management

Traditionally, management of natural resources has focused on a single target resource (e.g., a fish stock), an individual project (e.g., construction, oil and gas lease sale), or an individual risk factor (e.g., contaminants, harmful algal blooms) viewed in isolation from the rest of the ecosystem. Fisheries provide a clear example, wherein the traditional "single-species" approach has focused on the target stock, and fishery effects have been characterized primarily with regard to that stock only (e.g., has it been overfished relative to its expected pristine, or unfished, abundance?). That is, the single-species approach is based on the fundamental assumption that potentially significant human impact is limited to the target stock itself.

Such narrowly conceived approaches to management have occurred throughout the world's oceans and their consequences are well documented. In the Pacific Islands Region, such problems are evident around the main Hawaiian Islands, where multiple stocks have been fished down to such levels that the healthy or pristine state of the associated ecological community is virtually impossible to describe. In the waters around the Northwestern Hawaiian Islands, overfishing has occurred for pearl oysters, armorhead, and lobsters.

Single-species management is the antithesis of ecosystem-based management in that it largely disregards secondary ecological effects. In contrast, ecosystem-based management recognizes that ecosystems are more than random collections of unrelated species that can be managed in isolation. Instead, they are ecological communities of species that are linked to each other and the abiotic environment through ecological interactions (e.g., primary productivity, predation, competition, multiple forms of symbiosis) and that are affected by a number of natural and anthropogenic factors. An ecosystem represents a higher level of biological organization with its own properties (e.g., biodiversity, trophic web, resilience, stability) that vary over time and space but essentially reflect the components of the ecological community, the nature of their interactions, the environment in which they occur, and the consequences of individual and cumulative natural and anthropogenic influences on them.

Ecosystem-based management requires that managers address at least three main challenges. First and foremost, they must recognize the potential for indirect or secondary effects of human actions due to the ecological links that bind ecosystems together. Fisheries, for example, may affect not only the target stock but other ecologically related species as well. Removal of fish that are prey for marine mammals may have significant effects on those marine mammals if they are prey-limited. Similarly, removal of keystone predators may release their prey from predation pressure, which may in turn have an effect on other predators or competitors of those prey. Therefore, even if a fishery is managed such that the target stock remains “healthy” in the single-species context, the fact that fish were removed may result in complex, and undesirable, changes in other parts of the ecosystem.

Second, managers must develop comprehensive assessments and management strategies to address all the factors that pose significant risks to the ecosystem. Depending on the area involved, those risks may be related to fishing, aquaculture, coastal development, shipping and marine transportation, oil spills and pollution, military activities, marine debris, or any number of additional factors. Because ecosystems contain resources that are linked ecologically, the ecosystems may be degraded directly or indirectly if the individual and cumulative effects of important risk factors are not addressed in a comprehensive fashion.

Third, they must integrate the fragmented management approaches traditionally taken by the agencies with management responsibility and authority under existing legislation and policy. In the Northwestern Hawaiian Islands, for example, this will require cooperative efforts of the Fish and Wildlife Service, which manages the Hawaiian Islands and Midway Atoll National Wildlife Refuges; the State of Hawaii, which controls and manages Kure Atoll and nearshore waters out to 3 nmi; and the National Oceanic and Atmospheric Administration, including both the National Marine Fisheries Service, which manages fishery resources beyond 3 nmi, and the National Ocean Service, which manages the existing Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve and will manage the sanctuary, if and when it is designated. The need for such coordination was recognized in the Executive Orders that created the Coral Reef Ecosystem Reserve and directed the agencies to develop a cooperative agreement to guide management. These parties completed a draft memorandum of agreement in March 2002 for the purpose of facilitating joint management efforts in this region, but the draft has yet to be finalized. Completion of this memorandum of agreement is essential if the overall management approach is to be well integrated and coordinated to the extent necessary to take an ecosystem-based management approach in the Northwestern Hawaiian Islands.

### **Ecosystem-based Science**

The transition to ecosystem-based management will depend, in part, on the availability of scientific information needed to guide the transition. Essential information includes an understanding of (1) basic biology of the stocks involved, (2) the ecological interactions among the biotic and abiotic features of the ecosystems, and (3) the human activities in the region and the risks and effects associated with them.

To date, the science conducted on marine mammals generally has been of the first category (i.e., natural history and life history studies that emphasize elements needed for stock assessment). In the Pacific Islands Region, most research effort has focused on monk seals and humpback whales and, as a result, their basic biological characteristics are relatively well known. As already noted, however, even the most basic information is lacking for the majority of cetacean stocks, and a long-term, concerted effort is needed to describe their stock structure, abundance

and trends, vital rates, and distribution and movement patterns.

Considerable additional research is required to assess the ecological interactions that give these ecosystems their essential character. This research should include interactions of both the biotic and abiotic components of these ecosystems. Important biotic interactions begin with primary productivity and continue with the subsequent flow of energy and cycling of nutrients through the ecosystem trophic web via predation, competition, mutualism, commensalism, parasitism, and decomposition. Important abiotic components of the ecosystem include currents, tides, winds, temperature, salinity, depth, bottom topography and substrate, and availability of nutrients. In view of the dynamic nature of ecosystems, studies are needed not only to assess their biotic components, abiotic properties, and their interactions but also to assess the manner in which those components, properties, and interactions change over time and space under natural conditions. A range of abiotic forces may contribute to those dynamics (e.g., regime shifts, El Niño and La Niña events) and have potentially profound effects on the region's marine ecosystems.

Finally, collection of information on risk factors that may impact individual species and the ecosystem requires both domestic and international monitoring and research efforts. As part of its 2003 Consultation on Future Directions in Marine Mammal Research (see Chapter IV), the Commission identified a number of important threats to marine mammals (i.e., direct and indirect fisheries interactions, disease, contaminants, manmade sound, harmful algal blooms, habitat transformation, long-term environmental change, ill-defined conservation units, and human growth and demography). All are pertinent to the Pacific Islands Region. The most obvious threat may be from direct interactions with fisheries. Although the Pacific Islands Regional Office is increasing observer effort, that effort will address only fisheries within the U.S. EEZ. At the Commission's 2004 annual meeting, the Regional Administrator of the Pacific Islands Region indicated that fisheries in international waters are very large and increasing rapidly. International monitoring and management mechanisms are needed to protect cetacean stocks where such fisheries occur, whether those stocks occur inside or outside the EEZ or move back and forth across the EEZ boundary.

### **Furthering Ecosystem-based Science and Management in the Pacific Islands Region**

The Pacific Islands Region is rich with opportunities to develop ecosystem-based approaches to science and management. The following discussion highlights several of the opportunities and some of the benefits of this approach, as well as some of the tools and tasks needed to realize those benefits. The discussion focuses on the main Hawaiian Islands and the Northwestern Hawaiian Islands although additional opportunities exist in other parts of the Pacific Islands Region. To date, the Fish and Wildlife Service has taken the lead for development of a number of those other opportunities, based on its responsibilities for various terrestrial ecosystems and surrounding nearshore waters in the region.

The Hawaiian Islands Humpback Whale National Marine Sanctuary provides an obvious opportunity to facilitate the transition to ecosystem-based science and management in the main Hawaiian Islands. As currently implemented, the sanctuary is centered around a single species—the humpback whale—and sanctuary management has limited authority over activities that occur within the sanctuary areas. An expansion of the sanctuary's scope and authority could extend important protections to a broader range of species and, indirectly, to the habitats in which they occur. Such species could include a number that are currently listed as endangered or threatened (e.g., Hawaiian monk seals and sea turtles) or vulnerable to human activities (e.g., spinner dolphins) and thereby in need of additional protection. An ecosystem-based approach to management of this sanctuary also would foster more comprehensive assessments (i.e., sanctuary permitting, environmental assessments or impact statements under the National Environmental Policy Act, and section 7 consultations under the Endangered Species Act) of the risk factors that may degrade its essential character, such as aquaculture and high-speed ferry service. In effect, the sanctuary is a network of partially protected marine areas. If given adequate protection, these areas would provide essential baseline information that could be used to guide restoration and recovery of marine communities throughout the main Hawaiian Islands. With such protection, the sanctuary could be used to study important ecological processes, provide refuge for exploited species, and serve as a source of fish and invertebrates for ex-

exploited populations outside the sanctuary. In view of the already degraded state of the marine environment around the main Hawaiian Islands, a shift toward ecosystem-based management and science is essential for restoration and recovery.

The Northwestern Hawaiian Islands provide a range of important opportunities to advance ecosystem-based science and management, including the development of research and management tools. A comprehensive ecosystem-based science and management approach would provide important information needed to guide restoration efforts in this area, in the main Hawaiian Islands, throughout the Pacific Islands Region, and in other tropical and subtropical areas of the world's oceans. As in the main Hawaiian Islands, such an approach could also provide essential protection for rare, threatened, and endangered species, a number of which occur in the Northwestern Hawaiian Islands.

Finally, a number of important tools and tasks are needed to develop ecosystem-based science and management in the Pacific Islands Region. They include the following:

- Collection of baseline data. Such data are essential for understanding the natural character of ecosystems, which provides a reference for assessing the effects of human activities on them. In view of the dynamic character of these ecosystems, collection of adequate baseline information will require assessment of natural variation in ecosystem components and properties over space and time and is therefore a relatively long-term undertaking.
- Investigation of ecological relationships that link species and habitat into ecological communities or ecosystems. Such an understanding is essential to understand the complex secondary or indirect effects of natural phenomena and human activities in marine ecosystems.
- Investigation of the natural forces (e.g., oceanographic regime shifts) and anthropogenic factors (e.g., fishing) that influence or “stress” marine ecosystems to allow differentiation of such factors and assessment of their individual and combined influences.
- Development of metrics of ecosystem health to provide specific, objective, and measurable indicators of ecosystem status as a function of both natural and human influences.
- Development of adaptive management strategies. As more is learned—either through observation or experimentation—about the status of ecosystems,

their ecological character, and the impact of human activities on them, managers will be required to adapt their strategies in accordance with that new information.

- Development and verification of multispecies and ecosystem models. Models provide an important tool for testing our understanding of ecosystems and for predicting the influence of various factors, including human activities, on them. Although progress has been made in developing ecosystem models, much remains to be done to test and verify them to determine their reliability and utility for those purposes. Access to natural, intact marine ecosystems, such as those in the Northwestern Hawaiian Islands, is essential for such verification.
- Development of an effective marine protected area network throughout the Pacific Islands Region. The numerous marine protected areas in the main Hawaiian Islands and Northwestern Hawaiian Islands have been created at intervals over the past 100 years to address specific conservation issues apparent at the time. The resulting system, although extensive, has not been evaluated to determine if it meets the current protection needs of key species and ecosystems. Also, there are very few marine protected areas in the Pacific region EEZ outside the Hawaiian archipelago, and that region should be evaluated to determine if and where there are areas meriting special management measures.
- Development of multiagency and, where appropriate, multinational cooperative management strategies that encompass all important research and management needs for the ecosystem and its various components. Currently management responsibility for the region's natural resources is shared by a number of state and federal agencies including the State of Hawaii's Department of Land and Natural Resources, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the National Ocean Service, and the U.S. Coast Guard. A formal mechanism to provide coordination among these agencies would allow a comprehensive, ecosystem-based approach to management at all levels, from identification of issues to implementation of programs.

The transition to ecosystem-based management has been and continues to be a great challenge. Although the concept of such ecosystem-based management has gained widespread acceptance, the implementation has been obstructed by a range of obstacles. Even the identification or delimiting of

marine ecosystems has proven difficult because the marine environment is by nature fluid and dynamic. Ecosystem-based management also requires considerably more scientific information because it seeks to understand and control not only the direct consequences of human actions but also their indirect or secondary consequences and their cumulative consequences. The challenge is further complicated by ever-growing demands on marine ecosystems by in-

creasing human populations and resource consumption. In spite of these and other difficulties, the Pacific Islands Region has numerous, important opportunities to lead development of an ecosystem-based approach to marine science and management. Whether those opportunities are used to good advantage is, in many respects, a test of commitment to the concept of ecosystem-based management by the region's decision makers, managers, scientists, and the public.

## Chapter III

### SPECIES OF SPECIAL CONCERN

Section 202 of the Marine Mammal Protection Act directs the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, to make recommendations to the Department of Commerce, the Department of the Interior, and other federal agencies on research and management actions needed to conserve species of marine mammals.

To meet this charge, the Commission devotes special attention to particular species and populations that are vulnerable to the impact of various types 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 3). In addition, the Commission often directs special attention to other species or populations of marine mammals not so listed whenever special conservation challenges arise that may affect them.

During 2004 special attention was directed to a number of endangered, threatened, or depleted species or populations, including North Atlantic and North Pacific right whales, the Cook Inlet (Alaska) stock of beluga whales, the Florida manatee, and beaked and bottlenose whales. Activities regarding conservation of these species are addressed in this chapter. Activities related to conservation and management of cetacean species in the Pacific Islands Region, as well as the Hawaiian monk seal, are discussed in Chapter II as part of the special focus on the Pacific Islands Region.

In addition to those species mentioned above, significant numbers of marine mammal species and populations in other areas of the world also face major conservation challenges. Although the Commission has not been involved in oversight or management of many such species and populations, several are discussed briefly in Chapter V of this report to

provide the reader with a broader perspective on the status of marine mammals worldwide.

#### North Atlantic Right Whale (*Eubalaena glacialis*)

Unrelenting hunting pressure from the eleventh century to the mid-1900s reduced the status of the North Atlantic right whale to that of one of the world's most endangered mammals. Its current abundance is in the low 300s. Although commercial whaling for all right whales was banned by international agreement in the 1930s, the North Atlantic right whale has shown little sign of recovery. In recent years, the number of recorded births has increased from an average of about 11 calves per year between 1980 and 2000 to 22 per year since then, including a high of 31 births in 2001 and 16 births in 2004. However, since a dedicated right whale research program began in the early 1980s, there has been no clear evidence of overall population growth. Chronic human-related deaths due to ship collisions and entanglement in commercial fishing gear appear to be the principal obstacles to the species' recovery. Recent models suggest that loss of a single adult female per year could mean the difference between a stable population and a declining one. In 2004 three adult females were found dead, two of which were killed by ships.

Efforts by the National Marine Fisheries Service, the lead federal agency responsible for right whale conservation, have failed to reduce human-related mortality. As discussed in past annual reports, the Commission has made numerous recommendations aimed at reducing entanglements and ship collisions, but most of its key recommendations either have been rejected by the Service or are not yet acted

**Table 3. 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 2004**

Common Name	Scientific Name	Status	Range
<b>Manatees and Dugongs</b>			
West Indian manatee	<i>Trichechus manatus</i>	E/D	Caribbean Sea and North Atlantic from southeastern United States to Brazil; and Greater Antilles Islands
Amazonian manatee	<i>Trichechus inunguis</i>	E/D	Amazon River basin of South America
West African manatee	<i>Trichechus senegalensis</i>	T/D	West African coast and rivers; Senegal to Angola
Dugong	<i>Dugong dugon</i>	E/D	Northern Indian Ocean from Madagascar to Indonesia; Philippines; Australia; southern China
<b>Otters</b>			
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
<b>Seals and Sea Lions</b>			
Caribbean monk seal	<i>Monachus tropicalis</i>	E/D	Caribbean Sea and Bahamas (probably extinct)
Hawaiian monk seal	<i>Monachus schauinslandi</i>	E/D	Hawaiian Archipelago
Mediterranean monk seal	<i>Monachus monachus</i>	E/D	Mediterranean Sea; northwestern African coast
Guadalupe fur seal	<i>Arctocephalus townsendi</i>	T/D	Baja California, Mexico, to southern California
Northern fur seal	<i>Callorhinus ursinus</i>	D	North Pacific Rim from California to Japan
Western Steller sea lion	<i>Eumetopias jubatus</i>	E/D	North Pacific Rim from Japan to Prince William Sound, Alaska (west of 144° W longitude)
Eastern Steller sea lion	<i>Eumetopias jubatus</i>	T/D	North Pacific Rim from Japan to Prince William Sound, Alaska (east of 144° W longitude)
Saimaa seal	<i>Phoca hispida saimensis</i>	E/D	Lake Saimaa, Finland
<b>Whales, Porpoises, and Dolphins</b>			
Baiji	<i>Lipotes vexillifer</i>	E/D	Changjiang (Yangtze) River, China
Indus river dolphin	<i>Platanista minor</i>	E/D	Indus River and tributaries, Pakistan
Vaquita	<i>Phocoena sinus</i>	E/D	Northern Gulf of California
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
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
Sperm whale	<i>Physeter macrocephalus</i>	E/D	Oceanic; all oceans

Source: 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.

upon. As discussed later, in 2004 the Service continued to review possible measures to reduce entanglements and ship strikes but adopted no significant new measures even in the face of an unsustainable level of mortality that year.

### Right Whale Deaths and Injuries in 2004

At least half of all documented right whale deaths from 1990 through 2004 (Fig. 9) have been due to ship collisions (40 percent, 16 of 40 deaths) and entanglement in fishing gear (10 percent, four of 40 deaths). Excluding eight carcasses that were seen floating offshore but were not recovered for close examination, nearly two-thirds of all documented deaths during this period were due to ship strikes and entanglements. Several other right whales have disappeared after being last seen entangled in fishing gear. Many of these likely died as a result of the entanglement although the deaths were unobserved and thus unrecorded.

In 2004 four right whale deaths were documented, including two whales that were killed by ships off mid-Atlantic states as they were migrating to the species' calving grounds. Both of these whales were carrying full-term fetuses, magnifying the significance of the losses. One whale (#1004) had given birth to five

calves since 1980. It was found floating five miles off Virginia Beach, Virginia, on 7 February. It was towed ashore, necropsied, and found to have major bruising on the head and a fractured rostrum. The other whale (#1909), apparently struck by a Navy amphibious assault ship on 17 November, 10 miles off the mouth of the Chesapeake Bay, washed ashore on 24 November at Corolla on North Carolina's Outer Banks with a severed fluke (Fig. 10).

In addition to the two documented ship strikes, a newborn calf stranded alive on Amelia Island, Florida, on 3 February. It died while a rescue team was attempting to move it to a rehabilitation facility. The fourth death was that of an unidentified adult whale photographed by the Coast Guard on 10 December floating 65 miles southeast of Nantucket, Massachusetts. Due to poor weather, the carcass could not be towed ashore for examination, and the cause of death could not be determined.

From 2000 through 2003, 22 entangled right whales were documented. Of these, 2 were found dead, 12 were still entangled when last seen, 5 were able to free themselves, and 3 were disentangled and released with injuries (one of which was subsequently found dead from its injuries). Two new entanglements were reported in 2004. A one-year-old male (#3314)

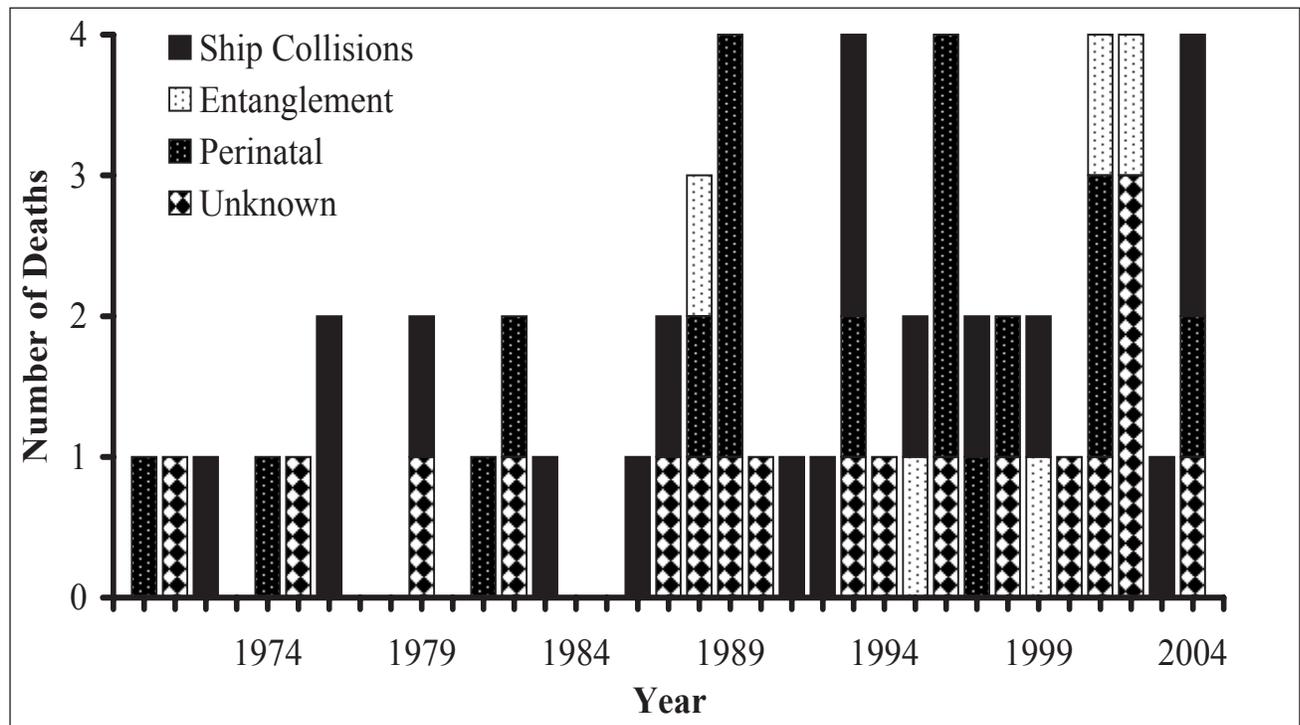


Figure 9. Known mortality of North Atlantic right whales, 1970–2004. Figure based on data from various sources and compiled by the Marine Mammal Commission.



Figure 10. Right whale found at Corolla on North Carolina's Outer Banks on 24 November 2004 after being struck by a ship. Photo courtesy of Susan G. Barco, Virginia Aquarium and Marine Science Center.

sighted on 17 March off St. Augustine, Florida, had a line with a buoy attached wrapped around both flippers and across its back. It disappeared before a disentanglement could be attempted. The second, a juvenile right whale (#3346), was first seen on 5 December off Virginia Beach, Virginia, entangled in New England lobster gear. A satellite tag was attached to the trailing gear to help relocate the animal for disentanglement. On 31 December a team of experts was able to reach the animal and successfully removed all attached gear. As of the end of 2004 the number of whales still entangled when last seen increased to 13 since 2000.

### Collisions between Ships and Whales

As already indicated, ship collisions are the largest documented source of human-related right whale mortality. To date, the principal actions taken by the National Marine Fisheries Service to reduce the risk of ship strikes have included (1) preparing educational materials urging mariners to be alert for whales so as to avoid hitting them, (2) adopting regulations in 1997 prohibiting vessels from approaching right whales closer than 500 yards, (3) transmitting sighting locations relayed from right whale aerial survey teams to mariners traveling through the right whale calving grounds off Florida and Georgia and feeding areas off New England, (4) consulting with federal agencies that operate vessels along the East Coast (i.e., the Navy, the Army Corps of Engineers, and the Coast Guard), and (5) establishing mandatory ship reporting systems for the calving grounds and feeding areas off Massachusetts. The latter require operators of large commercial vessels (i.e., vessels greater than 300 gross tons) to report to a shore station before entering the areas to obtain information

and advice on right whale protection. The U.S. Navy, which operates bases in both Georgia and northeastern Florida, has adopted additional measures for its ships when operating in the right whale calving grounds. Among other things, the Navy has directed its ships to limit operations in the calving grounds during the winter calving season and to use slow safe speed when traveling within five miles of the location of any right whale sighting made within the previous 12 hours. The Navy has also issued directives to the fleet requiring trained observers to be stationed on deck while at sea and the immediate reporting of any right whales observed or struck.

All collisions between ships and whales are unintentional and reflect the limited abilities both of vessel operators to see and maneuver around whales and of whales to detect and subsequently avoid an oncoming vessel. As a result, asking vessel operators to watch for and avoid whales, as already noted, likely does little to protect right whales unless the vessel slows down. Recognizing these limitations, the Commission recommended in 1996 that the Service work with the shipping industry operating out of key East Coast ports to identify ways of modifying vessel operations (e.g., reducing speed and altering routes) in areas where right whales are known to be or are likely to occur. The Commission's staff also organized a review of information on collisions between ships and whales. In part, that review found that the number of serious and lethal injuries to whales appears to increase sharply at vessel speeds between 10 and 13 knots.

In 2001 a study recommended by the Commission and completed under the auspices of the regional right whale recovery plan implementation teams established by the Service recommended specific mea-

asures for establishing speed and routing measures. After a review of the report's recommendations, the Service announced in the 1 June 2004 *Federal Register* that it was considering a right whale ship strike reduction strategy that incorporated most of the recommended actions. The strategy included possible regulations to (1) limit the speed of ships within 25 to 30 nautical miles (nmi) of 10 major East Coast port entrances during times that right whales were likely to be present, (2) establish a dynamic area management system that would require ships to limit their speed when near observed right whale concentrations, and (3) designate vessel traffic corridors for ships transiting the southeastern calving grounds and feeding grounds off Massachusetts. The Service also advised that, while maintaining measures already in place, it would consider steps to negotiate a right whale conservation agreement with Canada, review the need for section 7 consultations with federal agencies, and expand its education and outreach programs.

The Commission commented to the Service on the announced strategy on 5 August. It noted that, depending on the details of proposed operational measures, such as the speeds to which ships would

be limited, the boundaries of established management areas, and the criteria for triggering dynamic area management zones, the Service's proposed actions should address the need for reducing collision risks. Along with its letter, the Commission provided a graph incorporating all available ship/whale collision records, including information on both the speed of ships at the time of the collision and resulting injuries to whales (Fig. 11). Although the data include all species of whales and are limited, the graph illustrates that serious and lethal injuries to whales are rare or nonexistent at speeds of less than 10 knots, increase sharply between speeds of 10 and 13 knots, and are most common at speeds of 14 knots and greater.

With regard to the operational measures identified for consideration, the Commission recommended that the Service limit ship speeds to 12 knots or less in areas requiring speed limits and that it revise its educational materials on right whales to recommend that mariners use those speeds when right whales are seen or reported near a ship. The Commission also recommended that (1) the boundaries of speed zones around ports extend 25 to 30 nmi from the East Coast ports identified in the Service's announced strategy,

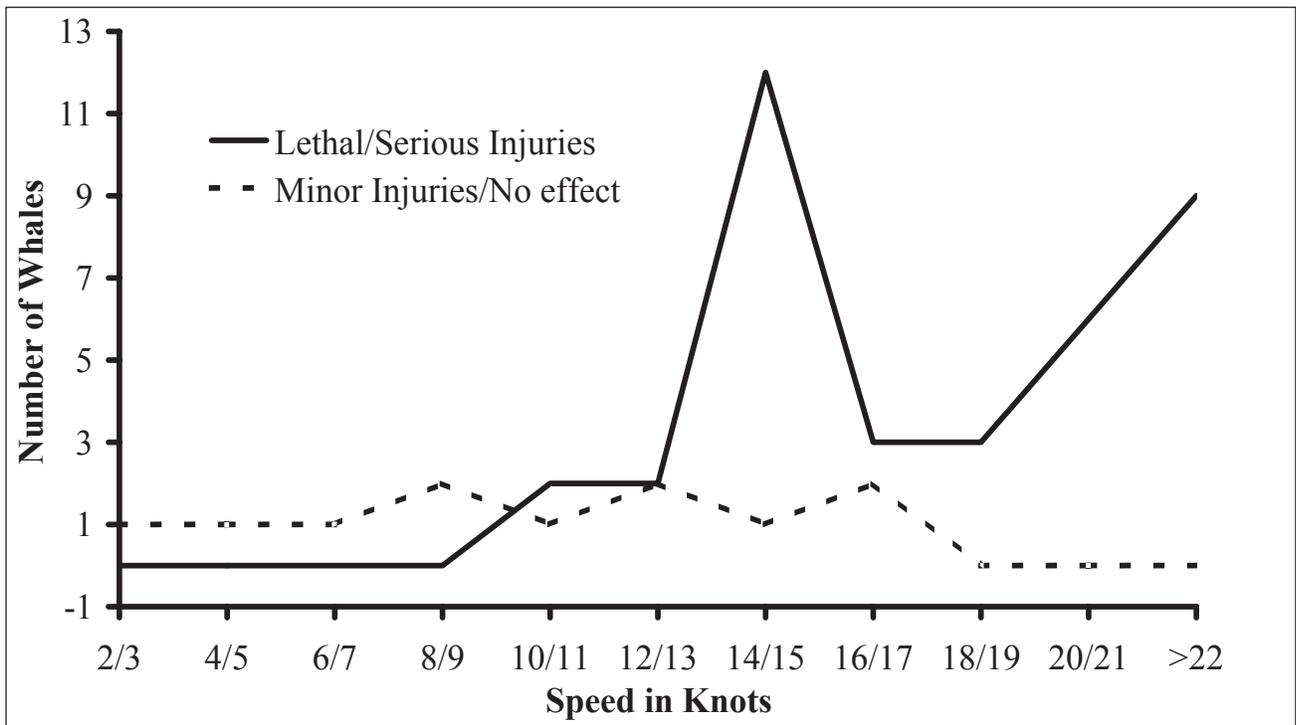


Figure 11. Number of serious and minor injuries to whales caused by ship collisions at different speeds. Lethal/Serious Injuries=observation of a dead whale or evidence of bleeding wounds. Minor Injuries/No Effect=reports of wounds with no mention of blood or whales seen swimming away with no reports of wounds. Data compiled by the Marine Mammal Commission and the National Marine Fisheries Service.

(2) speed restrictions for the calving grounds apply throughout the southeastern right whale critical habitat and mandatory ship reporting areas during the calving season, (3) dynamic area management zones be triggered immediately when a sighting is made that meets the criteria initially proposed by the Service for such zones for commercial fisheries (i.e., a density of 0.4 whales per nmi<sup>2</sup>), (4) information triggering dynamic area management zones for the Cape Cod Bay feeding area also include information on right whale prey density, which has been shown to be a useful indicator of times when right whales are likely to be present in that area, and (5) vessel operators be required to report any collision with a whale to help gather additional data on factors affecting collisions.

During the remainder of 2004 the Service held several public meetings in coastal communities to obtain views leading to a formal proposal.

### **Entanglement in Fishing Gear**

Entanglement in commercial fishing gear, principally gillnets and lines from lobster pots, is the second largest source of known right whale mortality. Such deaths, however, are less likely to be documented. Whereas whales killed by ships die rapidly and tend to float, entangled animals decline slowly and become emaciated due to interference with feeding as well as the effects of towing attached gear and infections from abrasions. As a result, they are more likely to sink when they die. Entanglement scars on living whales indicate that about three-fourths of all right whales have encountered and become entangled in gear. Considering the high frequency of entanglement and the lower probability of finding whales that die of entanglement, such deaths may be as frequent as or even more frequent than ship collisions.

To reduce entanglement risks, the National Marine Fisheries Service convened the Atlantic Large Whale Take Reduction Team to help develop a take reduction plan pursuant to provisions of the Marine Mammal Protection Act. Adopted initially in 1997, the plan relies on three fundamental approaches to reduce entanglement risks: (1) disentangling whales that become entangled, (2) gear modifications intended to make gear less likely to catch whales, and (3) time/area fishing closures in areas where right whales most commonly occur.

Because of increases in the number of observed right whale entanglements, the Service expanded and reconvened the take reduction team on 28–29 April

2003 to develop new take reduction measures. As in the past, the team was not able to reach agreement on all measures. On 30 June 2003 the Service announced its intent to prepare an environmental impact statement on new measures to reduce whale entanglement risks and requested comments on possible management options. As discussed in its previous annual report, the Commission commented on 29 July 2003. In addition, during its 21–23 October 2003 annual meeting, the Marine Mammal Commission reviewed the Service's efforts to reduce entanglement risks. Results of that review were provided to the Service by letter of 13 January 2004.

In its letter, the Commission noted that evidence of continued entanglements demonstrated that management efforts to date had been ineffective and that the Service's program was placing too much reliance on disentanglement efforts and unproven gear modifications and too little attention was being given to eliminating fishing gear in areas where whales are known to occur in high numbers. With regard to disentanglement efforts, the Commission noted that experience since 2000 had demonstrated that such responses were possible and useful in only a very few cases and that, although important, disentanglement was clearly not an appropriate solution to the problem. It also noted that most gear modifications, especially breakaway links, which are the most widely applied type of modification, were based on unsupported assumptions and have probably resulted in no appreciable protection. For example, it noted that right whales have continued to become entangled in gear with breakaway links. The Commission also noted that the one modification for which there is good justification for believing it would be helpful (i.e., the use of sinking line between lobster pots instead of floating line that extends up into the water column where it can entangle whales) has been required only in relatively small areas for brief periods. With regard to time/area closures, the Commission noted that, because of exceptions that allow continued fishing by vessels with gear modifications, there had been no reduction in fishing effort in designated areas.

The Commission therefore repeated its previous recommendations that the Service prohibit all gillnet and trap fishing in designated right whale critical habitat and adjacent areas known to be repeatedly used by large aggregations of right whales during seasons of peak whale occurrence. The Commission also noted that recommendations put forth by the Atlantic Large

Whale Take Reduction Team had consistently been ineffective because the membership was predominantly composed of fishing interests. Therefore, the Commission recommended that the Service immediately convene a scientific review team, composed of experts in marine mammal conservation, fisheries management, and ecosystem management, that would act as a separate and independent entity. Its charge would be to develop strategies to implement the fundamental changes in fisheries management that are needed to achieve compliance with the Marine Mammal Protection Act and the Endangered Species Act. In part, the review team would be asked to articulate a long-term plan that considers the optimal mix of fishing approaches, techniques, and practices that are most likely to result in sustainable fishing with minimum risk to right whales and regional ecosystems.

On 26 March the Service responded to the Commission letter, noting that it was dedicating more than \$1 million to the development of gear modifications to reduce entanglements and that it considered disentanglement efforts a stop-gap measure until better gear modifications are developed. With regard to the recovery of breakaway links on entangled whales, the Service noted that, in those cases, the whales had not become entangled in a way that allowed the links to break and thus their recovery on whales did not indicate that they were ineffective. With regard to establishing a separate scientific review team, the Service noted that it was not clear how the responsibilities of such a group would differ from those of the take reduction team, but that the Service was interested in discussing the idea further. However, after subsequent discussions with Service staff members, no action was taken to establish such a group.

As of the end of 2004 no action had been taken to strengthen the Atlantic Large Whale Take Reduction Plan since the April 2003 take reduction team meeting, and the Service was still reviewing and developing possible measures to reduce entanglement risks to right whales.

### **North Pacific Right Whale** *(Eubalaena japonica)*

The North Pacific right whale is probably the most endangered large whale in the world. Based on genetic studies, the National Marine Fisheries Service has recognized North Pacific right whales as a distinct

species for purposes of listing under the Endangered Species Act. Before this change, announced by the Service in the *Federal Register* on 10 April 2003, right whales in the North Atlantic and North Pacific Oceans were considered to be separate populations of the same species. Historical whaling records suggest that North Pacific right whales were divided into two populations—one in the eastern North Pacific and the other in the western North Pacific. The latter population, which is not well studied, inhabits waters off the coast of Russia and eastern Asia and is thought to number in the low hundreds.

In the early 1960s the International Whaling Commission received reports from Soviet and Japanese scientists of more than 350 sightings of right whales in the eastern Bering Sea and Gulf of Alaska, suggesting that a small population still survived in the eastern North Pacific Ocean. Over the next 20 years, however, only a few tens of sightings, scattered between Alaska, Hawaii, and Mexico, were reported. Almost all of the sightings involved single individuals or pairs of animals, and none involved calves. In the mid-1990s scientists learned that the Soviet sightings reported from the late 1950s and early 1960s were actually illegal landings by Soviet whalers. Given the rarity of sightings since then, it appeared that this spate of illegal whaling had killed almost all of the remaining right whales in the eastern North Pacific and that the regional population is all but extinct.

In the summer of 1996 a group of four right whales was seen in the southeastern Bering Sea. Subsequent summer surveys of the area organized by the National Marine Fisheries Service between 1997 and 2004 yielded sightings of from three to 13 whales per year. All of those sightings were within a 60-by-100-nmi area north of Unimak Pass in the eastern Aleutian Islands (Fig. 12). Photo-identification and genetic sampling revealed that these sightings involved at least 11 and six individuals, respectively.

Based on these sightings, the Center for Biological Diversity petitioned the Service in October 2000 to designate most of the eastern Bering Sea as right whale critical habitat under the Endangered Species Act. The Marine Mammal Commission commented in support of the action on 11 July 2001, but on 20 February 2002 the Service published a *Federal Register* notice announcing that it had determined that the action was not warranted at that time. Although acknowledging that such a designation might be prudent, the Service concluded that the extent of critical

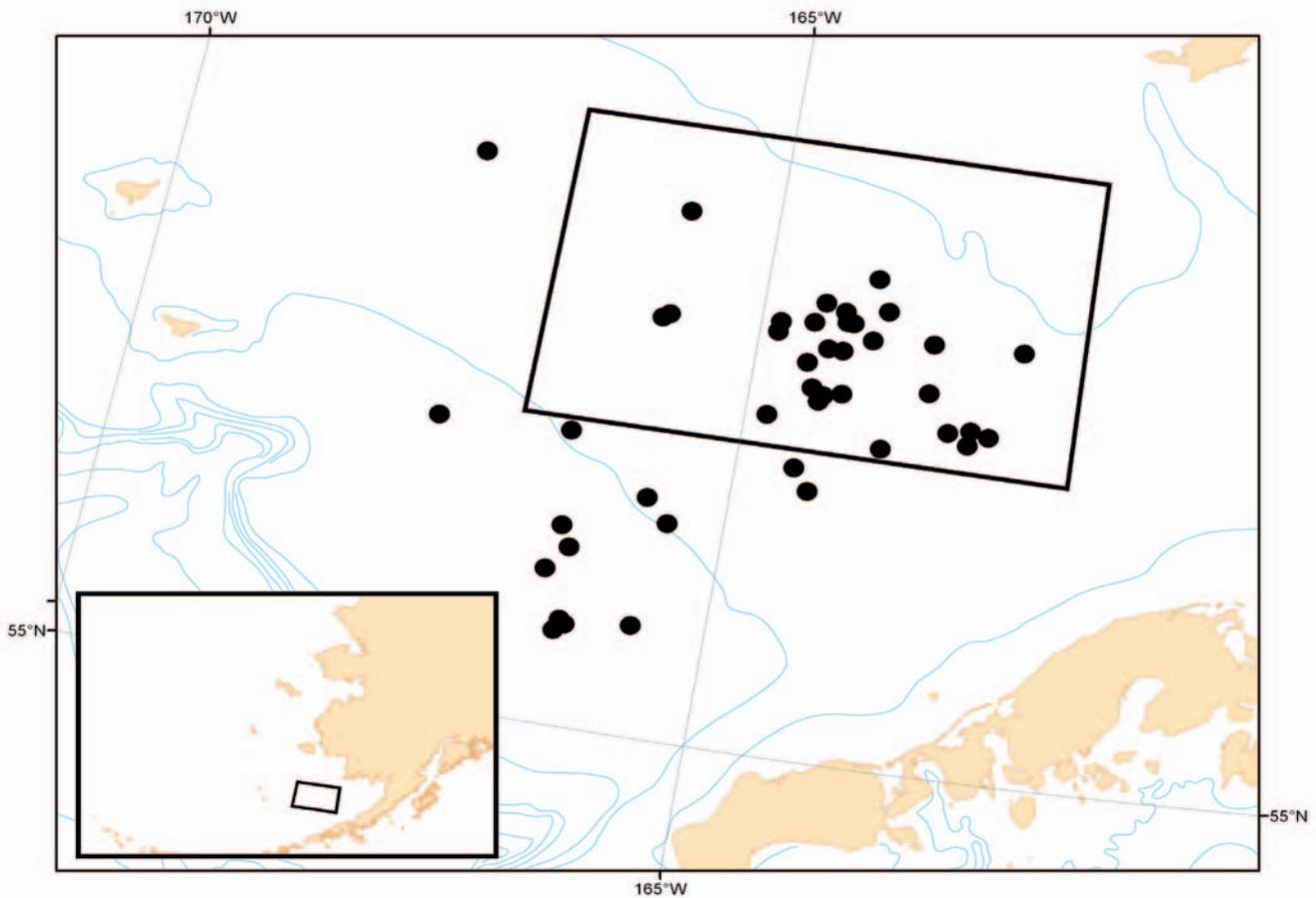


Figure 12. Location of North Pacific right whale sightings in the southeastern Bering Sea, 1996–2004. Figure courtesy of Kimberly Sheldon, National Marine Mammal Laboratory.

habitat could not be determined with available information. It therefore advised that it would continue to analyze issues raised by the petition based on the results of future surveys and research.

In the summer of 2004 hopes for the survival of an eastern North Pacific right whale population again improved. Consistent with recommendations by the Marine Mammal Commission, scientists from the Service’s Alaska Fisheries Science Center, the Greenland Institute of Natural Resources, and Scripps Institution of Oceanography traveled to the southeastern Bering Sea where right whales had been seen in past years and attempted to locate individual whales and attach satellite-linked tags to document their movements. By means of acoustic monitoring, two right whales were located from their vocalizations detected more than 70 miles away. Both individuals were subsequently tagged. Over the following month, the whales re-

mained in the eastern Bering Sea but moved west and southwest of the area where virtually all recent sightings had been made (Fig. 12). Using tag location data relayed to them, another team of whale researchers studying humpback whales along the Aleutian Islands was led to a concentration of about 25 right whales. The animals were observed over three days early in September feeding in relatively shallow waters near humpback and fin whales. The sightings nearly doubled the number of individuals identified over the past seven years and included three cow/calf pairs. There had been only one previous report of a right whale cow/calf pair in the North Pacific since the 1960s.

Although scientists hoped to track the whales to their wintering grounds, which are unknown, tag transmissions lasted only about two months. The last tag location was received on 19 September from a whale that was still in the southeastern Bering Sea.

The tags continued to transmit water temperature data until early October.

In late October 2004 the Center for Biological Diversity filed a lawsuit asserting that the National Marine Fisheries Service's 2002 decision not to designate critical habitat for North Pacific right whales constituted a violation of protection requirements under the Endangered Species Act.

Although the new information offers hope for the species' future, their rarity in the eastern and western North Pacific suggests that prospects for their long-term survival are poor. As of the end of 2004 the Service's Alaska Fisheries Science Center hoped to carry out another right whale tagging effort in the summer of 2005. However, it was not clear whether funding for such research would be available.

### **Cook Inlet Beluga Whale** *(Delphinapterus leucas)*

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

The most isolated population of beluga whales in U.S. waters is found in Cook Inlet and is separated from the other four populations by the Alaska Peninsula. Because of their proximity to Anchorage, beluga whales in Cook Inlet are exposed to the largest urban coastal area in Alaska. Analyses by the National Marine Fisheries Service 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 National Marine Fisheries 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**

As discussed in recent Commission reports, the National Marine Fisheries Service designated the Cook Inlet beluga whale as depleted under the Marine Mammal Protection Act on 31 May 2000. The Service determined in 2000 that listing the stock under the Endangered Species Act was not warranted, primarily because it believed that overharvest by subsistence hunters, the primary threat to the stock, was being adequately addressed. The Service concluded that, although the population had been reduced to a small size, a stock with at least 300 individuals and a positive intrinsic growth rate was unlikely to go extinct due to stochastic events. In light of recent population trends, however, the Commission believes that the Service needs to revisit its listing decision.

Aerial surveys of beluga whales in Cook Inlet have been conducted by the National Marine Fisheries Service annually in June or July since 1994. Data from those surveys indicate that the Cook Inlet beluga whale population declined from an estimated 653 individuals in 1994 to 347 in 1998. That constitutes about a 47 percent decline in four years. As discussed later, the high level of taking by subsistence hunters that contributed to this decline ended in 1998, and it was assumed that the population would show signs of increase once this source of mortality had been regulated. Based on abundance estimates collected over the past six years, this does not appear to be the case. The Service had predicted that the population would increase by between 2 and 6 percent per year in the absence of any hunting. However, no such increase has been detected, despite the fact that subsistence hunters have reported taking only three whales since 1998. Based on its 2004 surveys, the Service estimated the abundance of the Cook Inlet beluga whale population to be 366 (CV = 0.2). Although higher than the 2002 and 2003 estimates, the difference is not statistically significant. Abundance estimates dating back to 1994, and the confidence limits around those estimates, are provided in Figure 13.

Section 117 of the Marine Mammal Protection Act requires the National Marine Fisheries Service to prepare a stock assessment for each marine mammal stock under its jurisdiction that occurs in U.S.

waters. These assessments are to be reviewed annually for strategic stocks, such as the Cook Inlet beluga whale, which is considered strategic because it has been designated as depleted. Because there had been no change in the status of the affected stocks or any new information relative to their status, the Service did not prepare revised stock assessments in 2004 for stocks occurring in the Alaska Region, including the Cook Inlet beluga whale. For a discussion of the most recent stock assessment report for Cook Inlet beluga whales and Commission comments thereon, see the previous annual report.

**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. Only if a stock has been determined to be depleted or has been listed as endangered or threatened may any other limits be placed on such taking.

Estimates derived from a variety of 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 the large number of beluga whales taken during the mid-1990s 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

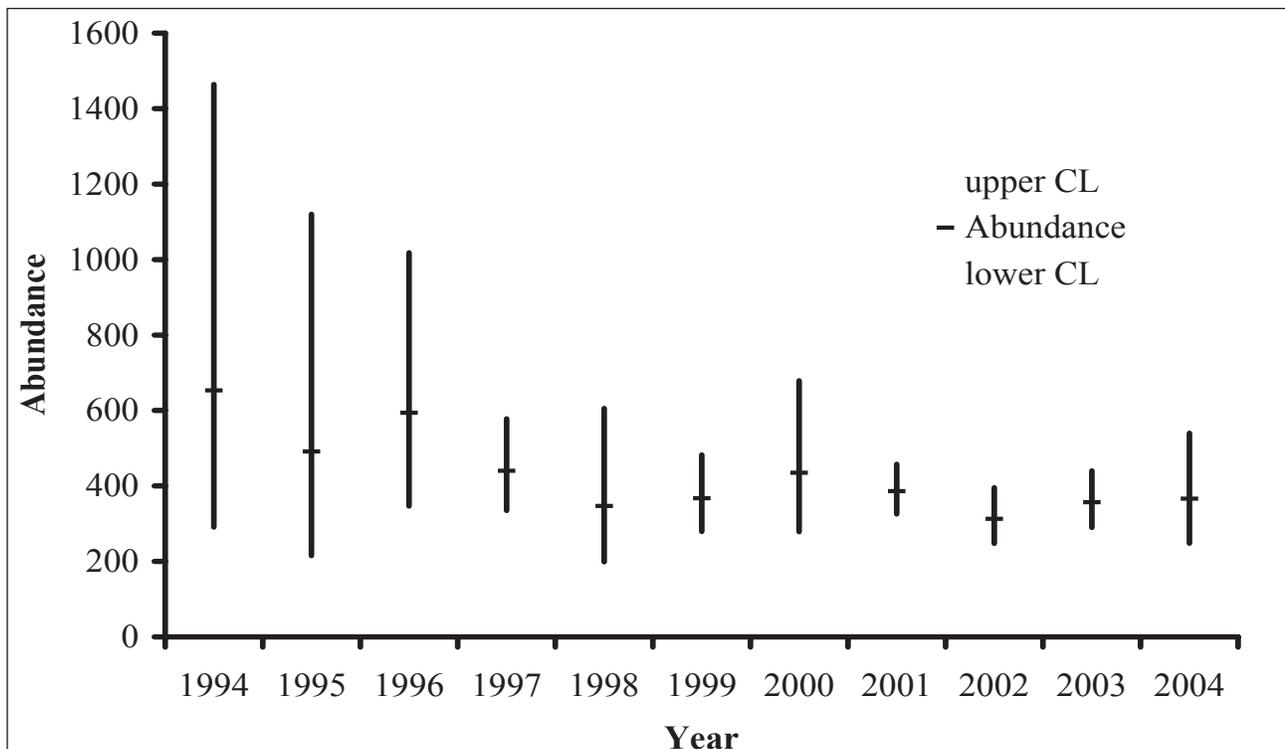


Figure 13. Abundance (and upper and lower confidence limits) of Cook Inlet beluga whales, 1994–2004. Data provided by the National Marine Fisheries Service.

**Table 4. Reported Alaska Native subsistence take of Cook Inlet beluga whales, 1993–2004**

Year	Reported Total Number Taken	Estimated Range of Total Take	Reported Number Harvested	Estimated Number Struck and Lost
1993	30 <sup>1</sup>	N/A	N/A	N/A
1994	21 <sup>1</sup>	N/A	19 <sup>1</sup>	2 <sup>1</sup>
1995	70	N/A	42	26
1996	123	98–147	49	49–98
1997	70 <sup>2</sup>	N/A	35 <sup>2</sup>	35 <sup>2</sup>
1998	42 <sup>2</sup>	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

<sup>1</sup> Estimated value (see 2002 stock assessment report).

<sup>2</sup> Represents a minimum value.

Data provided by the National Marine Fisheries Service.

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 is still pending at the end of 2004.

The Service entered into cooperative agreements with the Cook Inlet Marine Mammal Council each year between 2000 and 2003 to authorize a limited subsistence hunt. The agreements for 2000, 2001, and 2003 authorized a single strike in each of those years, with the understanding that these strikes would be allocated to the Native Village of Tyonek. The 2002 agreement authorized two strikes, with one being allocated to Tyonek and the other to the remaining community of Native hunters in the Cook Inlet area.

Under the strike limits agreed to by the parties to the rulemaking, it was anticipated that two strikes

would be allocated to Native hunters for 2004. However, on 19 December 2003, the National Marine Fisheries Service's Alaska Regional Administrator wrote to the hunters explaining that an unusually high number of beluga whale mortalities had occurred in Cook Inlet during the year. Data compiled by the Service indicated that 20 dead whales, in addition to the one whale taken for subsistence, had been reported as of 12 December. Under a stipulation agreed to by the rulemaking parties, all hunting is to be suspended if the number of "unusual mortalities" exceeds 18 in any year. As such, the Regional Administrator asked that Native hunters agree to refrain from taking any whales in 2004 and until the population has recovered from the effects of the unusual mortalities. The Native hunters agreed to forego hunting in 2004. As a result, no whales were taken, and no harvest management agreement was concluded.

### Regulation of Native Harvest

Section 101(b) of the Marine Mammal Protection Act provides authority for the Service to regulate the taking of depleted species of marine mammals by Alaska Natives when necessary for the conservation of the affected species or stock. Such regulations, however, may only be prescribed through formal rulemaking, which affords affected Natives and other interested parties the opportunity for a hearing on the record, through which an administrative law judge develops the record of the proceeding and subsequently provides a recommended decision to the agency. Section 103(d) of the Act sets forth the rulemaking procedures and the information that must be published by the agency before, or concurrent with, the publication of a proposed rule. Among other things, the agency is to publish and make available to the public any recommendations provided to the Service by the Marine Mammal Commission that relate to the regulations.

Based in part on the Commission's advice, the Service published a proposed rule on 4 October 2000 to establish 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.

A formal hearing at which the proposed regulations were considered was held by the Service in Anchorage, Alaska, in December 2000. The Commission participated as one of seven parties at the hearing. As discussed in previous annual reports and above, the parties subsequently agreed to an interim quota. The parties further requested that the judge retain jurisdiction over the issue of strike limits for 2005 and subsequent years and agreed to a process for developing a long-term, science-based harvest regime that (1) provides reasonable certainty that the population will recover within an acceptable period of time, (2) takes into account the uncertainty with respect to the population dynamics and vital rates of the Cook Inlet beluga whale population, (3) allows for periodic adjustments of allowable strike levels based on the results of abundance surveys and other relevant information, (4) provides assurance that the strike levels will not be reduced below those for 2001–2004 unless substantial information indicates that taking must be reduced to allow recovery of the stock, and (5) can be readily understood by diverse constituencies. The National Marine Fisheries Service was tasked with providing its recommendation for the long-term management regime to the judge by 15 March 2004.

The administrative law judge issued his recommended decision on 29 March 2002, which was published for public comment on 7 May 2002. After considering those comments and completing its environmental impact statement on the proposed action, the Service, on 6 April 2004, published final interim regulations governing the harvest of Cook Inlet beluga whales by Alaska Natives. The interim regulations codified the harvest level of 1.5 whales per year for 2001–2004 and the emergency suspension provision as stipulated to by the parties to the rulemaking. The regulations also allowed hunting to begin as early as 1 July each year, rather than 15 July as would have been the case under the proposed rule. Shifting the start of the hunting season should protect near-term pregnant female whales from unintentional harvest, while allowing Natives a greater opportunity to hunt during their traditional season. A copy of the judge's recommended decision, the *Federal Register* notice soliciting comments thereon, the comments received,

the final environmental impact statement, the interim final rule, and other documents related to the rulemaking are available on the National Marine Fisheries Service's Web site (<http://www.fakr.noaa.gov/protectedresources/whales/beluga.htm>).

As noted above, the administrative law judge overseeing the rulemaking directed the Service, after consulting with the other parties, to submit its proposal for the long-term harvest regime to govern subsistence taking beginning in 2005 by 15 March 2004. As noted in the previous annual report, the Commission wrote to the Service at the end of 2002 noting that considerable work needed to be done to meet the judge's deadline and prompting the agency to schedule the agreed-to meeting for developing the long-term harvest regime. In response, the Service convened two technical meetings during 2003.

At the first meeting, the Commission recommended that the parties agree to establish overarching policy goals to govern the selection of annual strike limits. Specifically, the Commission suggested three standards for governing the long-term harvest regime: (1) that it provide a 99 percent probability that the stock will eventually recover to its optimum sustainable population, (2) that it provide a 95 percent probability that the stock will recover to its optimum sustainable population within 100 years, and (3) that it provide a 95 percent probability that the time to recovery will not be delayed by more than 25 percent. No consensus was reached by the participants as to what quantitative standards should govern the harvest, or even if the adoption of specific, numerical recovery goals was desirable.

At the second meeting, the Service and hunters tentatively agreed to extend the quota applicable for 2000–2004 for an additional five-year period, with two strikes being allowed in 2005, 2007, and 2009 and one strike being allowed in 2006 and 2008. They believed that more data on population trends were needed before a data-dependent harvest regime could be implemented. While sympathetic to the need for more data, the Commission did not agree to this proposal. Although willing to accept a quota of 1.5 whales per year at the outset, the Commission thought it essential that the harvest regime include an additional framework that would set appropriate triggers for increasing, decreasing, and suspending the harvest during that period. Further, the Commission noted that a proposal that addressed only a five-year period did not satisfy the judge's charge to develop a

harvest management regime for 2005 and subsequent years. Another point made by the Commission was the desirability of targeting male whales, which likely would have less of an impact on recovery of the Cook Inlet beluga whale stock.

Based on the discussions at the two meetings, the Service prepared a draft of its proposed long-term harvest plan, which it circulated to the parties for comment on 15 January 2004. The Service included a five-year extension of the interim harvest quota, alternating between two strikes and one strike each year. For 2010 and thereafter, harvest levels would be set in accordance with the goal of not delaying the time-to-recovery of the stock to a population of 780 whales by more than 25 percent, with a 95 percent statistical certainty (referred to as the 25-95 criterion). Under the Service's plan, strike limits would be established for five-year intervals. If the population were increasing, and if consistent with the 25-95 criterion, the plan would have increased the number of strikes allowed by 0.5 to one whale per year. If the population were declining, the allowable harvest would be reduced. If the estimate of the minimum population size dropped to below 200 whales, no harvest would be allowed for the next five-year period. The plan also included an emergency suspension provision that would be triggered if observed animal mortalities exceeded 6 percent of the stock's minimum population estimate.

The Commission submitted comments on the proposed harvest plan to the Service on 13 February 2004. The Commission strongly supported the adoption of the 25-95 criterion but noted that the other criteria proposed by the Service for establishing harvest limits failed to meet that primary goal. The Commission pointed out that, based on current data, there was only a 31 percent chance that the delay in time-to-recovery would not exceed 25 percent if the harvest continues at a rate of 1.5 whales per year. In fashioning its proposal, the Service apparently assumed that the population would grow annually at a rate between 2 and 4 percent, despite several years of empirical data indicating a much lower growth potential for this stock. Based on an analysis of population abundance data, the Commission concluded that there was about a 75 percent likelihood that the actual growth rate of the Cook Inlet beluga population is less than 2 percent per year. The Commission also commented on an inconsistency in the logic of the Service's proposal. Although the Service had adopted the 25-95

criterion recommended by the Commission, changes to the harvest limits would be based on whether the population were growing or declining. Applying the Service's criteria to a population with a zero growth rate, for example, would result in continuation of the existing quota despite the fact that the population might never recover.

Another issue addressed by the Commission was the proposed continuation of interim harvest levels for an additional five-year period. The Commission recommended that interim levels remain in place for three years and that the 25-95 criterion be used as the basis for the harvest management regime beginning in 2008. By then, 10 years of data will be available to evaluate the population's response to low harvest levels, which should provide sufficient statistical power to make the required determinations.

The Commission also questioned the appropriateness of setting the proposed "floor" beyond which no harvest should be allowed at 200. The Commission noted that there was nothing in the conservation biology literature to support allowing the stock to decline to 100 or fewer breeding females before curtailing the harvest. The Commission believed that the population, because of its small size, was already at risk genetically and indicated that allowing a significant, further population decline before stopping all preventable takes was inconsistent with the Marine Mammal Protection Act's goal of population recovery. The Commission further noted that, if the Service fully implemented the 25-95 criterion, there would be no need to establish an "arbitrary numerical floor."

The Commission also commented on the harvest suspension provision proposed by the Service. The Commission agreed that inclusion of such a provision was needed but questioned whether there was a sufficient basis for assuming that all dead beluga whales would be detected and factored into the proposed determination. The Commission therefore recommended that the Service provide additional evidence regarding the efficacy of detecting beluga mortalities. In addition, the Commission recommended that the Service consider alternative criteria that would more directly reduce the allowable harvest in response to unusual mortality events.

The Commission's comments also highlighted the deferential impact on the population of targeting male versus female whales. The Commission suggested that hunters be asked to target males preferentially

and that the number of allowable strikes be reduced if two or more females are taken during any five-year period, unless the 25-95 criterion is being met.

After considering comments from the Commission and other parties, the Service submitted its proposed subsistence harvest management plan to the administrative law judge on 30 April 2004. It was this proposal that was to be considered at a second rulemaking hearing to be held on the matter. As with the draft proposal, the plan submitted to the judge incorporated the 25-95 criterion. However, it would be applied only when the Cook Inlet beluga stock was experiencing a positive growth rate. The Service noted that, “[w]hen no growth or a decline in the population occurs, the 25-95 goal would require that the harvest be reduced to zero.” The Service believed that it should balance the Act’s recovery goal with the desire to provide subsistence opportunities to Alaska Natives. As such, the Service proposed to reduce, but not immediately eliminate, the number of authorized strikes if the beluga stock declined below its current level. The plan submitted by the Service also retained a five-year extension of the interim harvest levels because the Service believed that this was necessary because “existing data do not provide sufficient resolution on the population trends within this stock to support the management strategy which will be used in subsequent five-year intervals.”

The Service’s proposed plan included a harvest table for determining the allowable five-year harvest levels at various population sizes and under three different population trends—increasing, stable, and declining. No taking would be allowed if the best estimate of the population declined below 260, which would ensure, with 95 percent confidence, that whales are not removed from a population of fewer than 200. The narrative accompanying the table indicated that this corresponded to an “effective population size” (i.e., the number of reproductively active females in the population) of as few as 60 animals. The table also set forth the number of “unusual mortalities” that would trigger suspension of the harvest at different population sizes. Those numbers were generated using the 6 percent rule that the Service had included in its earlier draft.

The Service wrote to the Commission on 25 June 2004 to provide additional explanation of its proposed plan and to provide responses to the Commission’s comments on the draft plan. The Service recognized

that the Commission had not agreed to the five-year extension of the interim quotas but believed that such an extension would not impede recovery of the stock and would allow Native hunters the time necessary to develop a multiple-year harvest plan. The Service also indicated that a five-year extension would enable it to enter into multiple-year co-management agreements with Native organizations and would provide time to collect additional data on the abundance and trends of the Cook Inlet beluga whale stock.

The Service’s response acknowledged that the goal of providing 95 percent certainty that any authorized harvest would not delay by more than 25 percent the time needed for the stock to recover to the point where it was no longer depleted would not always be met under its proposed plan. The Service believed, however, that it was an appropriate balancing of the dual goals of achieving recovery of the stock and providing reasonable harvest levels for subsistence users. It thought that the harvest levels in the plan’s table met both objectives and would ensure that the population would recover, provided that the annual growth rate of the stock remains between 2 and 6 percent.

The Service agreed with the general thrust of the Commission’s suggestion that male whales be preferentially hunted and indicated that co-management agreements would include measures to reduce the taking of females. However, the Service declined to incorporate a requirement to stop the hunt if a certain number of females were taken because the proposed harvest levels already assumed an equal division of males and females among the harvested animals.

The Service also defended its selection of 260 as the appropriate population size at which no harvest should be allowed. The Service continued to believe that this threshold afforded adequate protection to the population “from excessive harvest removals at abundance levels for which additional mortalities would be expected to have serious consequence to the stock’s recovery and survival.”

As for the Commission’s concern that not all dead beluga whales might be detected, the Service indicated that, although it could not provide evidence to support its assessment of the efficacy of the existing monitoring programs, it nevertheless believed that those programs produced a high probability of detecting most dead beluga whales within the middle and upper portions of Cook Inlet. Further, the Service noted that what it intended to use was primarily an

“index of mortality,” which would compare current-year mortality data with those gathered over the last decade.

On 10 June 2004 the administrative law judge presiding over the rulemaking issued an order setting a hearing on the Service’s harvest plan for 2 August. That order also established a schedule for the submission of direct and rebuttal testimony and other documentary evidence by the parties. Pursuant to that order the Commission submitted three documents: a declaration from Daniel Goodman, Ph.D., rebuttal testimony from Dr. Goodman, and a response to the initial filings from other parties. Those filings reiterated several of the points raised by the Commission at meetings to formulate the proposed plan and in its comments on the draft plan that will not be repeated here. Other key points made by the Commission include the following:

- The proposed plan fails to meet three of the elements for the long-term regime as stipulated by the parties after the 2000 hearing in that it does not provide reasonable certainty of population recovery; does not respond correctly to the uncertainty or the available evidence about the population dynamics; and fails to provide for reducing the harvest rate below the interim minimum as soon as substantial information demonstrates such a reduction is needed to ensure population recovery.

- The core failure of the Service’s proposed plan is that it ignores the existing information about the population dynamics of the Cook Inlet beluga population. It proceeds on the optimistic assumption that the population is growing at between 2 to 4 percent, when available data indicate an actual growth rate that is considerably smaller. The best (central) estimate of the growth capacity for the population derived from survey data is a little less than half a percent per year. Analysis of those data showed about a 46 percent probability that the growth capacity is negative—that is, that the population is declining even though only three whales have been taken for subsistence in the past five years.

- Rather than treating future harvest as the only important factor that will be affecting the population, the Service needs to consider harvest as a contributing factor that could make a bad situation worse, even to the point of precluding recovery. Not only should management take into account the evidence of depressed population growth in regulating future harvests, it should direct additional research and moni-

toring efforts at determining why the population is not recovering as expected, as a matter of priority.

- The proposed mechanism for reducing the allowable harvest for a declining population is too insensitive, because it demands a 95 percent confidence that the trend is declining. Because of this misplaced burden of proof, the probable performance of this aspect of the plan is such that it will be triggered at about the same time as the census floor clause (i.e., when the population has declined to 260 whales). As such, this measure is largely meaningless.

- The “unusual mortalities” clause of the Service’s plan also offers insufficient protection, because its baseline is the average of the observed nonharvest mortalities during the period 1999–2003. This was a period during which the population failed to recover as expected and might have already been a time of unusual mortalities. If this is the case, waiting for observed mortalities to exceed this by a margin of about 50 percent before suspending the harvest does not provide sufficient protection.

- The Marine Mammal Protection Act does not require a balancing of stock recovery with subsistence needs. To the extent that providing continued subsistence harvest opportunities to Alaska Natives can be characterized as a “goal” of the Act, it is subservient to the overarching goal of maintaining marine mammal stocks at optimum levels and bringing about the prompt recovery of stocks that are depleted. This relative importance of recovery versus subsistence opportunities is reflected in section 2 of the Act, which sets forth its findings and policies, and in section 101(b) of the Act, which provides for the regulation of subsistence taking of depleted stocks, consistent with the purposes of the Act. The balancing reflected in the Service’s proposed plan conflicts with the Act’s paramount goal of achieving recovery of the stock.

The scheduled hearing was convened in Anchorage, Alaska, on 2 August 2004 and lasted two and a half days. During the hearing, the parties were afforded the opportunity to present direct testimony and cross-examine other parties’ witnesses. Parties were also given the latitude to propose and examine alternative harvest strategies that were responsive to weaknesses identified in the Service’s original proposal. In this regard, the administrative law judge, in the course of the proceeding, expressed concern that the proposed harvest levels were being established based on theoretical estimates of the growth potential of the population rather than using the data derived

from the Service's abundance surveys. Also, although sympathetic to the needs of subsistence hunters, the judge indicated that he was reluctant to recommend a regime that would allow the beluga population to decline significantly below its current numbers.

At the conclusion of the hearing, the judge agreed to give the parties an opportunity to continue to explore alternative harvest management regimes and to seek a consensus among the Native hunters, the Service, and the Commission. The judge directed the parties to use a proposal introduced at the hearing by the Native Village of Tyonek as a starting point for those discussions. The Commission had recommended during the hearing that, rather than generating proposed harvest numbers and testing their performance against unspecified criteria, the parties should establish a set of explicit recovery criteria that would be used to set the harvest levels in light of observed population trends. The Commission indicated that it would continue to pursue this alternative approach.

Following the hearing, the Commission undertook a more rigorous analysis of the Tyonek proposal. The Commission also sought to develop a set of criteria for governing the establishment of allowable harvest limits, which were circulated to the other parties on 8 October 2004. The recommended criteria were aimed at assuring timely recovery of the stock, assuring that the delay in the time-to-recovery is not excessive, and guarding against further decline of the stock when at a level considered to be "severely depleted." Although not explicit in the proposed criteria, the Commission observed that they would operate such that no harvest would be allowed if the population is declining or not growing, but that once the population begins to recover, brief periods of decline or lack of growth would not automatically result in suspension of the harvest.

The Commission believed that an acceptable long-term harvest regime should have a 95 percent certainty of achieving recovery to the stock's optimum sustainable population level within 100 years from the time that excessive harvests were curtailed (i.e., by 2099), when calculated over all parameter combinations that would allow for recovery within that period. For parameter combinations that do not allow recovery within 100 years, the regime should have a 95 percent certainty of terminating harvest within 10 years.

The Commission also recommended that the regime should provide a 95 percent certainty that the cumulative take will delay recovery by no more than the larger of five years or 25 percent, as compared with a scenario of no subsistence harvest and no incidental take, using 1999 as the starting point. Again, the certainty about the delay would be calculated over all parameter combinations that allow recovery in the absence of all permitted take. Likewise, for parameter combinations that do not allow recovery in the absence of permitted take, the regime should have a 95 percent certainty of terminating the harvest within 10 years.

The last element recommended by the Commission applies to "severely depleted" stocks. The Commission proposed that this be defined as any stock that is below one-half of its optimum sustainable population level using the "best" estimate of the stock's abundance. For the Cook Inlet beluga whale, this would apply when the best estimate of the population's abundance is below 390 individuals. The Commission proposed that the long-term harvest regime provide a 95 percent certainty that such a stock would not be allowed to decline by more than an additional 5 percent before terminating the harvest.

The Commission noted that there were several ways of apportioning harvests to achieve these recovery goals. Rather than attempting to calculate harvest limits that would meet the recommended criteria, the Commission believed that this was something best done by technical experts in consultation with the hunters who will be directly affected by the apportionment decisions. In this regard, the hunters are best situated to determine whether they are willing to forego some harvest opportunities in the early years to have potentially greater harvests in later years. Alternatively, they may wish to structure the harvest to allow more whales to be taken in the early years but limit possible increases in future years.

The Commission's proposal also backed away somewhat from its earlier proposal concerning an all-male harvest. Although still concerned about the potentially greater impact of removing breeding-age females, the Commission noted that so little is currently known about the age and sex structure of the stock that the impact of preferentially harvesting some subsets of animals cannot accurately be predicted. The Commission therefore recommended that additional research

into stock structure be required as a priority matter and that the harvest regulations be flexible enough to address the implications of the research results.

The Commission's analysis of the Tyonek proposal concluded that it failed to meet any of the three criteria being proposed by the Commission. In general, the Commission found that the proposed harvest rates were too high to allow for timely recovery if the population's growth rate is as low as the available data suggest. In addition, the proposed harvest regime was much too slow in its ability to detect and respond to population declines or stalled recovery.

The other parties to the rulemaking never formally responded to the Commission's proposed criteria. Nevertheless, they incorporated refinements into their proposed harvest regimes that brought them closer to achieving the goals enunciated by the Commission. At the end of 2004 the parties and their technical experts were still working to reach consensus on a long-term harvest regime. From the Commission's perspective, most of the shortcomings of earlier proposals concerning the number of removals that could be allowed from increasing populations had been overcome. However, there continued to be substantial disagreement as to how to govern harvests from declining or static populations.

The parties expect to conclude their discussions early in 2005, and those issues that cannot be resolved by stipulation will be referred to the administrative law judge to be addressed in his recommended decision.

### **Florida Manatee** **(*Trichechus manatus latirostris*)**

The Florida manatee, a subspecies of the West Indian manatee, occurs only in rivers and coastal waters in the southeastern United States. Because of their limited tolerance to cold, virtually all Florida manatees overwinter near warm-water habitats, including natural springs, in the southern two-thirds of the Florida peninsula. During the coldest winter periods, most animals aggregate at small, localized warm-water refuges. Based on a statewide winter survey of these refuges and other winter habitat areas in 2001, Florida manatees are thought to number at least 3,300 animals. Similar surveys since 2001 have yielded lower counts ranging from 1,758 in 2002 to 3,127 in 2003. In 2004 the count was 2,505. Because

there currently is no way of determining the number of animals away from major refuges or otherwise not counted at the time of a survey, the smaller counts since 2001 are not believed to reflect a decrease in abundance.

There are currently thought to be four subpopulations that maintain a high degree of site fidelity to warm-water refuges in four general areas: the upper St. Johns River (about 170 animals), northwestern Florida (more than 300 animals), along the Atlantic coast (at least 1,300 animals), and in southwestern Florida (at least 1,200 animals).

The principal source of human-related manatee mortality is collisions with watercraft. Such deaths typically account for one-quarter to one-third of the annual recorded manatee mortality (Table 5). In 2004 watercraft deaths totaled 69 animals (25 percent of all recorded deaths in 2004) and fell for the second year in a row to the lowest level since 1998. The second leading cause of human-related manatee deaths involves floodgates and navigation locks, whose closing doors can pin or crush animals caught in them. Those deaths also have declined in recent years due to mitigation efforts by the Army Corps of Engineers and the South Florida Water Management District to retrofit gates and locks with sensors that stop and reverse a closing door or gate when a manatee or other large object is detected. Approximately three-fourths of the structures initially designated to be equipped with the new closing mechanisms have now been modified. Although no new devices were installed in 2004 because of budget constraints, additional work is planned for 2005.

Although human-related mortality is the most immediate threat to Florida manatees, habitat modification and loss may pose a greater long-term threat. More than 60 percent of all Florida manatees rely on warm-water refuges formed by thermal discharges from power plants to survive cold winter periods. Most of the power plants were built more than 30 years ago, some more than 50 years ago. Some could be retired within a few years, and most could be closed within 20 to 30 years. Regulations adopted since the older plants were built prohibit the authorization of such thermal outfalls from new facilities. Thus, as power plants are retired, large numbers of manatees could be exposed to cold stress, with potentially significant effects on the population.

Although the U.S. Fish and Wildlife Service and the Florida Fish and Wildlife Conservation Commis-

**Table 5. Known manatee mortality in the southeastern United States (excluding Puerto Rico) reported through the manatee salvage and necropsy program, 1978–2004**

Year	Vessel-Related Deaths No. (%)	Floodgate and Lock Deaths No. (%)	Other Human-Related Deaths <sup>1</sup> No. (%)	Perinatal Deaths No. (%)	Other Deaths <sup>2</sup> No. (%)	Total Deaths in the Southeastern United States
1978	21 (25)	9 (11)	1 (1)	10 (12)	43 (51)	84
1979	24 (31)	8 (10)	9 (12)	9 (12)	28 (36)	78
1980	16 (25)	8 (12)	2 (3)	13 (20)	26 (40)	65
1981	24 (21)	2 (2)	4 (3)	13 (11)	74 (63)	117
1982	20 (17)	3 (3)	2 (2)	14 (12)	78 (67) <sup>3</sup>	117
1983	15 (19)	7 (9)	5 (6)	18 (22)	36 (44)	81
1984	34 (26)	3 (2)	1 (1)	26 (20)	66 (51)	130
1985	35 (28)	3 (2)	3 (2)	23 (19)	59 (48)	123
1986	33 (26)	3 (2)	1 (1)	27 (22)	61 (49)	125
1987	39 (33)	5 (4)	4 (3)	30 (26)	39 (33)	117
1988	43 (32)	7 (5)	4 (3)	30 (22)	50 (37)	134
1989	51 (29)	3 (2)	5 (3)	39 (22)	78 (44)	176
1990	49 (23)	3 (1)	4 (2)	45 (21)	113 (53)	214
1991	53 (30)	9 (5)	6 (3)	53 (30)	54 (30)	175
1992	38 (23)	5 (3)	6 (4)	48 (29)	70 (42)	167
1993	35 (24)	5 (3)	7 (5)	39 (27)	61 (41)	147
1994	51 (26)	16 (8)	5 (3)	46 (24)	76 (39)	194
1995	43 (21)	8 (4)	5 (2)	56 (28)	91 (45)	203
1996	60 (14)	10 (2)	1 (0)	61 (15)	284 (68) <sup>4</sup>	416
1997	55 (22)	8 (3)	9 (4)	61 (25)	113 (46)	246
1998	67 (28)	9 (4)	7 (3)	52 (21)	108 (44)	243
1999	84 (30)	15 (5)	8 (3)	52 (19)	116 (42)	275
2000	79 (28)	7 (3)	9 (3)	58 (21)	126 (45)	279
2001	82 (24)	1 (0)	7 (2)	63 (19)	183 (45)	336
2002	98 (31)	5 (2)	9 (3)	53 (17)	150 (48)	315
2003	75 (20)	3 (1)	7 (2)	72 (19)	226 (59) <sup>5</sup>	383
2004 <sup>6</sup>	69 (24)	3 (1)	4 (1)	72 (26)	132 (47)	282

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

<sup>2</sup> Includes deaths due to cold stress, other natural causes, and undetermined causes.

<sup>3</sup> Includes 39 deaths attributed to a spring red tide event in southwestern Florida.

<sup>4</sup> Includes 149 deaths attributed to spring and fall red tide events in southwestern Florida.

<sup>5</sup> Includes 98 deaths attributed to a spring red tide event in southwestern Florida.

<sup>6</sup> Data for 2004 are preliminary.

Data provided by the Florida Fish and Wildlife Conservation Commission.

sion share lead responsibility for conserving Florida manatees, many other federal, state, and local agencies, nongovernmental groups, and industry organizations assist in recovery work. To coordinate these efforts, the Fish and Wildlife Service has prepared and

periodically updated the Florida Manatee Recovery Plan (last updated in 2001). In addition, the Service has formed a Florida Manatee Recovery Team that was substantially restructured and expanded late in 2002. It now includes more than 140 people from 60

agencies and groups who participate on one or more of 12 recovery team working groups.

### Watercraft-Related Manatee Deaths

As already noted, collisions between manatees and watercraft are the largest source of human-related manatee mortality. To reduce the number of such collisions, management agencies rely principally on two approaches: (1) regulations to limit boat speed and access in areas where collision risks are greatest, and (2) restrictions on developing boating access facilities in key manatee habitat.

**Speed and Access Restrictions**—Work to develop boat speed zones began in earnest in 1989 when the Florida Governor and Cabinet directed that state and county agencies establish such zones throughout 13 key counties where collision risks with manatees appeared to be greatest. Speed zone systems have since been adopted for each of those counties using various types of zones (e.g., channel-exempt, channel-inclusive, and shoreline speed zones) and various speeds (e.g., idle, slow, 25 mph, and 30 mph—the higher speeds usually limited to channels surrounded by slower speed areas). The selection of zone types has been based on site-specific assessments of manatee habitat, geographic conditions, vessel traffic patterns, and public comment. Establishing these zones has sometimes been exceedingly controversial. In some cases, boater interest groups have filed challenges to the rules, asserting that such zones are overly restrictive given manatee abundance; in other instances, environmental groups have filed lawsuits asserting that the zones are not restrictive enough and that the number of collisions is unacceptably high.

Within this charged atmosphere, the Florida Fish and Wildlife Conservation Commission and the Fish and Wildlife Service have continued efforts to refine established speed zones in the 13 original key counties and institute rules in other counties containing important manatee habitat. In 2004 boat speed rules remained hotly contested in some areas, especially Lee County in southwestern Florida. Lee County has either equaled or led all Florida counties with the highest yearly total of watercraft-related manatee deaths for seven of the past 10 years, including a record 23 deaths in 2001. State boat speed rules for the county were adopted in 1999 and posted between 2000 and 2002.

After a lengthy challenge of the state's rule by local boating interests, a 2 March 2004 appellate

court ruling invalidated the state's speed zones in five areas of Lee County. Concluding that an absence of speed zones for those areas posed an imminent threat to the regional manatee subpopulation, the Fish and Wildlife Service published a *Federal Register* notice on 7 April 2004 announcing that it was establishing emergency rules under the Marine Mammal Protection Act and the Endangered Species Act to reinstate comparable speed restrictions for those areas. Under the measure, manatees in the five areas continued to receive protection. At the end of 2004 the Service was taking steps to establish permanent rules for those areas. Also in 2004 the State of Florida adopted new boat speed rules for portions of three counties bordering Tampa Bay on Florida's west coast. As of the end of 2004 boat speed zones had been established in most or part of 24 Florida counties.

**Evaluation of the Effectiveness of Boat Speed Zones**—Despite efforts to develop new speed zones since 1989, watercraft-related manatee deaths generally continued to increase (see Table 5). Possible reasons for that increase include the belief that: (1) the assumption that manatees are able to avoid slow-moving boats is false and boat speed restrictions offer little protection, (2) compliance rates with established zones have been too low to reduce collision risks, (3) the type or extent of speed zones crafted for waterways have been too weak to protect manatees (e.g., slow and idle speed restrictions have been too narrowly applied in key areas), and (4) the new zones have been partially effective, but increasing numbers of boats and manatees have increased collision rates faster than new speed zones have reduced them.

To help evaluate these causes, the Marine Mammal Commission, the Service, and the Florida Fish and Wildlife Research Institute examined trends in watercraft-related deaths in Sykes Creek and the Barge Canal in Brevard County. The two areas, located near Cape Canaveral, form a connected network of narrow waterways that have been among the deadliest areas in the state for manatees. From 1986 to 2002 an average of nearly two collision-related deaths per year were documented in these waterways. In response, the State adopted channel-exempt speed restrictions for Sykes Creek in 1990. Similar areas interspersed with channel-inclusive slow speed areas were established for the Barge Canal in 1994. Despite these measures, watercraft-related deaths continued to occur at an average of more than two per year from 1994 to 2001.

Given the continuing number of deaths, the Fish and Wildlife Service designated the area as a federal manatee refuge early in 2002 under the Marine Mammal Protection Act. As part of the designation, regulations were established limiting vessels to slow speed throughout the two waterways year-round. As noted in the Marine Mammal Commission's comments in support of the measures in 2001, the concentration and history of manatee mortality makes the area particularly valuable for assessing the effectiveness of boat speed zones. From the time enforcement of the new zones began late in May 2002 through the end of 2004, only one death (0.4 per year) was recorded. Although more time is needed to fully assess the new rules, results to date suggest that boat speed zones can be effective, that channel-exempt speed restrictions are not effective for narrow waterways, and that the most likely explanation for the increasing trend in watercraft-related deaths after 1989 is either limited boater compliance or poorly designed restrictions. At the end of 2004 steps were being taken to publish the results of this analysis.

**Restrictions on the Development of Boating Facilities**—A second approach for reducing risks of watercraft collisions with manatees has been limiting the development of watercraft access facilities in areas where manatee occurrence is particularly high, such as warm-water refuges, major feeding areas, and heavily used manatee travel corridors. Both the Florida Department of Environmental Protection and the U.S. Army Corps of Engineers require state permits for constructing marinas, boat ramps, and private piers and docks in Florida waterways. Each year hundreds of permit applications are reviewed by the Florida Fish and Wildlife Conservation Commission and the Fish and Wildlife Service to determine if the facilities would alter vessel traffic patterns (e.g., vessel densities and routes) in ways that could increase the risk of watercraft collisions with manatees. Where restrictions on such facilities have been imposed and approval processes have been slowed, controversy and public concern have often arisen.

To help address this concern, the 1989 directive by the Florida Governor and Cabinet noted earlier encouraged the 13 key manatee counties to develop comprehensive manatee protection plans as part of required county growth management plans. In part, the county plans are to include guidance for developing new watercraft access facilities in a manner consistent with manatee protection needs. The plans

are reviewed by the Florida Fish and Wildlife Commission and the Fish and Wildlife Service and require state approval.

In 2004 the two agencies announced an interim review process for watercraft access facility permits in which consistency with approved county manatee protection plans would provide a basis for expediting permit reviews. They advised that, with limited exceptions, permit applications found by both agencies to be consistent with an approved county manatee protection plan would be expedited, subject to standard conditions dependent on the type and size of the facility. For counties without approved plans, multi-slip projects would continue to undergo comprehensive site-specific reviews by both agencies. As of the end of 2004 manatee protection plans for 10 Florida counties had been approved by the state.

**Conflict Resolution**—As noted in previous annual reports, the highly contentious issues and lawsuits related to boat speed rules and watercraft access permits have prompted the Fish and Wildlife Service and the Florida Fish and Wildlife Conservation Commission to pursue a conflict resolution strategy. The objective was to bring key parties together to work through their differences. Efforts to do so in 2003 stalled; however, on 9 November 2004 the Florida Fish and Wildlife Conservation Commission convened a manatee forum to bring together federal, state, and local agency officials and stakeholders representing various interests and perspectives, including boating organizations and environmental groups. The meeting provided an opportunity for interests to clarify their views and was envisioned as a step toward establishing a constructive ongoing dialogue among the involved agencies and nongovernmental groups.

### **Management of Warm-Water Refuges**

Currently there are 18 major warm-water refuges with at least one winter count of 50 or more manatees (Fig. 14). Ten of these refuges are thermal outfalls at power plants built more than 30 years ago, four are natural springs, and three are thermal basins. Of the nine sites with winter counts greater than 200 manatees, seven are power plants (Fig. 15), one is a natural spring, and one is a thermal basin. Some power plants used by manatees could be retired within a few years and many could be shut down within the next 20 to 30 years. The effect of power plant closures on manatees is uncertain. Some people have suggest-

ed that manatees would simply move farther south to warmer parts of the state where most manatees occurred early in the 1900s before the plants were built. Others believe that most manatees now accustomed to using plant outfalls are not likely to move south and that significant levels of cold-stress-related mortality could occur. The future of warm-water springs also is uncertain due to groundwater withdrawals and human development in spring recharge areas.

To begin examining management needs related to possible plant closures and threats to natural springs used by manatees, the Fish and Wildlife Service, the Florida Fish and Wildlife Conservation Commission, and Florida Power & Light Company convened a workshop on warm-water refuges in 1999. A result of that meeting was the formation of a Warm Water Task Force as a working group of the Florida Manatee Recovery Team. Composed of representatives of state and federal agencies (including the Marine Mammal Commission), power companies, environmental groups, and the scientific community, the task force is assessing and implementing measures to assure the long-term availability of appropriate warm-water habitat for manatees.

To help identify an appropriate course of action, the Commission’s representatives undertook a

review of available information on past and current winter habitat for Florida manatees and the possible effects of power plant closures. Based on that information, they identified possible management actions to mitigate potential effects of power plant closures and threats to natural springs. Preliminary results of that review were considered by the task force and factored into the development of a draft warm-water refuge action plan. The results also were presented at a Manatee Habitat Workshop convened by the Fish and Wildlife Service in November 2004.

In part, the review revealed that water temperatures even in southernmost Florida can fall below manatee tolerance levels for weeks at a time. To survive those periods, manatees rely on two functional types of warm-water refuges: (1) thermal discharges from power plants and natural springs, and (2) thermal basins (i.e., localized areas such as deep holes where water temperatures cool more slowly than surrounding areas). More than three-fourths of the manatees counted during the January 2001 survey, which produced the highest manatee count to date, were observed at thermal discharges, most of which are in the central third of the Florida peninsula. Fewer than a quarter of the animals seen during that survey were at thermal basins, most of which are in southern Florida.

Given information on manatee use of these refuges and the distribution of cold-related deaths throughout Florida, the review concluded that the warm-water springs in the central and northern third of the Florida peninsula offer the best natural winter habitat for manatees and would be the areas best able to support large numbers of manatees in winter if access by manatees to springs was restored.

Such access and distribution also may have been the case in the distant past. Given fossil evidence of manatees in rivers of central Florida with natural warm-water

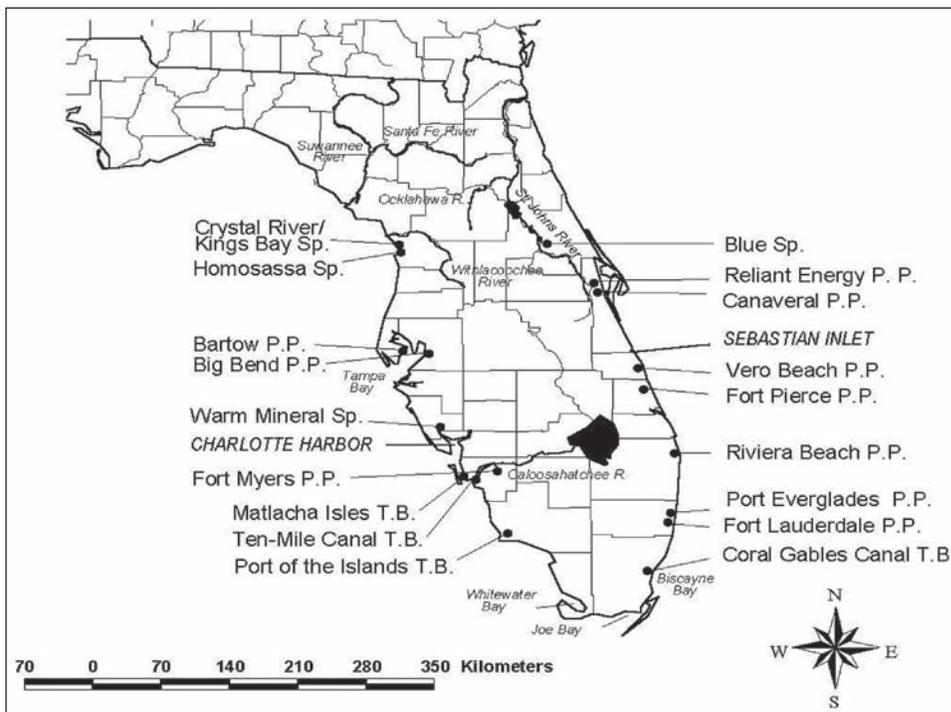


Figure 14. Natural and artificial warm-water refuges (P.P., power plant, S.P., spring, T.B., thermal basin) with at least one winter count of 50 or more Florida manatees.



Figure 15. Perhaps 85 percent of the Atlantic Coast subpopulation of manatees relies on warm-water outfalls from power plants, such as this one in Riviera Beach, to survive cold winter periods. Photo courtesy of the Florida Fish and Wildlife Conservation Commission.

springs and the species' affinity for warm-water discharges in winter, the review concluded that northern springs may once have been important winter manatee habitat. However, human hunters living near warm-water springs may have eliminated most manatees north of the Florida Everglades by the early 1900s. In this regard, the review revealed new, although limited evidence that manatees may have been hunted in central Florida since the arrival of the first Paleoindians in Florida about 12,000 years ago. Thus, human hunting, particularly in the 1800s, may have restricted manatees largely to remote areas in southernmost Florida by the early 1900s. Their increasing numbers at power plant outfalls and natural springs in central Florida in the late 1900s may reflect a reoccupation of former habitat.

Based on this analysis, the review concluded that a long-term strategy was needed to protect natural warm-water springs in central Florida and to encourage and enhance manatee access to springs, many of which have been modified or blocked by dams and locks in ways that preclude or limit manatee access. Given the large number of manatees that now rely on power plant outfalls, the review also concluded that steps are urgently needed to develop and test possible mitigation measures for preventing cold-stress mortality in the event plants are retired. In this regard, the

review identified the following possible management options: (1) developing temporary nonindustry-dependent warm-water refuges using solar water-heating technology in areas near power plants now used by large numbers of manatees, (2) constructing new thermal basins in southernmost Florida, (3) developing approaches to gradually discourage manatees from using warm-water industrial outfalls, and (4) closely monitoring plant closures and rescuing distressed manatees.

As noted earlier, these approaches were considered by the Florida Manatee Recovery Team's Warm Water Task Force and incorporated into a draft plan developed to guide research and management activities related to warm-water refuges. The team's draft plan identified the need for both interim (i.e., 20 to 40 years) and long-term (i.e., more than 40 years) management goals. As an interim goal, it recommended maintaining a network of warm-water habitats for each of the four currently recognized Florida manatee subpopulations to maintain their current winter range in Florida. For this purpose, it determined that artificial warm-water sources currently supporting large numbers of overwintering manatees from Brevard County south on the Atlantic coast and from Tampa Bay south on the Gulf of Mexico coast needed to be retained or replaced by one or more functionally

equivalent sources of warm water. It also determined that flow rates at natural springs now used by manatees, or that might be used in the future, should be maintained at current levels. For the long term, the task force concluded that a network of sustainable warm-water refuges with a minimal dependence on technology and artificial warm-water sources should be identified and maintained at a level sufficient to remove Florida manatees from the federal list of endangered and threatened species.

At the end of 2004 the Commission was preparing to publish the results of the review and to finalize the Warm Water Task Force's recommended action plan.

**Assessing the Feasibility of Solar-Heated Warm-Water Refuges**—To help develop possible options for mitigating the effect of power plant closures on manatees, the Commission contracted with the Florida Solar Energy Center late in 2003 to assess the technical feasibility of using solar water heating technology to create temporary warm-water refuges for manatees. The assessment expanded on an earlier study supported by Florida Power & Light Company and involved estimating the thermal requirements and costs of a solar heating system to provide warm-water refuges at three hypothetical locations along Florida's east coast. The east coast is of particular concern with regard to plant closures because nearly 85 percent of the regional manatee subpopulation now relies on power plant outfalls to survive winter. The study attempted to estimate thermal heating requirements and the cost of solar panels to maintain a manatee refuge at 22 °C throughout the winter using a heat flux model and hourly water temperature and weather data. The study considered sites in the northern, central, and southern parts of the Atlantic coast manatee subpopulation's current winter range. It also considered two possible refuge configurations: (1) a large refuge capable of supporting several hundred manatees, and (2) a small refuge able to support about 50 animals.

Preliminary study findings were presented at the September 2004 workshop on manatee habitat and were provided to the Warm Water Task Force. The study envisioned a closed circulation system in which water heated by solar panels is used to heat water in a semi-enclosed basin through a heat exchanger at the bottom of the refuge basin. It concluded that commercially available unglazed solar collectors could maintain a basin at 22 °C through the winter in the southern and central portions of the species' Atlan-

tic coast range and that, in those areas, a simple pool cover one meter above the surface might be adequate to retain heat in a basin. For a northern site near Cape Canaveral, the study concluded that such solar panels could maintain a basin at 22 °C most of the time. During the coldest winter periods, a small gas-fired water heater could be used to supplement heat collected by the solar panels.

For refuges at the northern end of the winter range where regional temperatures are coldest, the report estimated that the cost of solar panels, pumps, pipes, and a small backup water heater would be about \$130,000 for a small refuge (50-by-50 feet) and \$750,000 for a large refuge (150-by-150 feet). Costs not factored into the estimate include those for land, constructing the enclosed refuge basin, a heat exchanger for the bottom of the refuge, and the development of detailed construction plans. The expected life of the system was 20 years. To further explore the feasibility of such a facility, the study concluded that a solar-heated refuge should be built and tested. At the end of 2004 the Warm Water Task Force was considering steps to identify a potential east coast test site for which detailed construction plans could be developed. The task force would then develop the plans further and use them to refine estimates of construction costs, solicit public comment, gain financial support, and obtain necessary project permits. The earliest construction could begin would be 2006.

**Spring Flow at Blue Spring**—Blue Spring is a large warm-water spring used by a discrete subpopulation of manatees on the upper St. Johns River. Water from the spring stays a constant 23 °C year-round and flows down a half-mile-long spring run to the St. Johns River. About 170 manatees—virtually the entire regional population—rely on the spring to survive winter cold periods. Although the spring's discharge rate typically fluctuates both within and among years depending on annual rainfall, flow rates appear to have declined and become more variable since they were first measured in the 1930s. Drought conditions and groundwater withdrawals for domestic and agriculture uses and development in the spring recharge area are possible causes for reduced flow.

Concerns for the future of Florida's extensive system of natural springs prompted the State of Florida to establish a Springs Task Force in 2000. In part, the task force was charged with identifying and maintaining minimum flow levels for springs throughout Florida. Because of Blue Spring's importance for

manatees, the Florida Fish and Wildlife Conservation Commission and the Fish and Wildlife Service urged the task force to focus initial efforts at Blue Spring. In response, the St. Johns Water Management District, the state agency with direct management responsibility for the spring, supported a study to model the effect of declining spring flows on the area of the spring run available for manatees. Based on the results, the District requested comments early in 2004 on a proposal to steadily increase minimum spring flow levels from a minimum level of 130 to 157 cubic feet per second (cfs) by 2029.

On 26 April 2004 the Marine Mammal Commission wrote to the District commending its efforts to project minimum flow levels for Blue Spring based on the assessment of warm water needs for manatees. The Commission also noted that, under the proposal, the District would allow additional groundwater withdrawals for new development on an assumption that spring flow rates could be reduced by about 25 cfs from historic levels and still meet manatee thermoregulatory requirements. However, the Commission expressed concern that, if the additional authorizations occurred and drought conditions returned before minimum flow levels were increased toward historical levels, then flow rates could be reduced below the current levels, which could adversely affect manatees. The Commission therefore recommended that the District establish a single minimum flow rate of 157 cfs, effective immediately, and that it develop and implement a management program for spring flow to assure that flows during winter are adequate to maintain water temperatures in the spring run above 20 °C.

As of the end of 2004 a final rule establishing a minimum flow level for Blue Spring had not been announced.

**Manatee Access to Homosassa Springs**—Homosassa Springs is a major warm-water spring at the head of the Homosassa River, six miles south of Crystal River. The property around the spring and its half-mile-long spring run was developed as a privately owned wildlife attraction in the 1940s. A fence was constructed by the owner to keep boat traffic from entering the attraction, and in 1980 manatees were introduced into the fenced-off headwaters of the spring run where tourists view them from an underwater kiosk. The spring run downstream of the fence is now used by up to 100 manatees in winter. In 1990 the State purchased the property, which it now man-

ages as the Homosassa Springs State Wildlife Park. Park managers have retained the fence and continue to maintain manatees in the fenced-off headwaters. Because of the limited number of natural warm-water refuges available to manatees, the Commission in 2000 wrote to the Florida Department of Environmental Protection, which manages the park, urging that steps be taken to remove the fence and open the entire spring run to wild manatees. However, the captive manatees are a major attraction for park visitors, and no action to remove the fence was taken.

In 2001 some of the captive animals were diagnosed with a previously unknown papilloma virus that causes lesions and rough skin patches. To prevent direct contact between the captive and wild manatees, the fencing was doubled. However, the virus has since been found in the region's wild manatee population. Unlike with the captive animals, however, observed skin lesions on wild animals have tended to heal and disappear over time. Captive animals in the spring run also have become overweight and appear to be in poorer health than captive manatees at other facilities. The Service therefore convened an independent panel of marine mammal veterinarians in the summer of 2004 to review information on the captive animals' health. Based on the panel's findings and recommendations, the Service considered writing to the Florida Department of Environmental Protection to request that it work with the Service to remove the captive animals from the spring. In late 2004 the Service asked the Marine Mammal Commission for comments in support of its request.

At the end of 2004 the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, was completing a review of information on the situation and developing a response to the Service. Its review identified several major concerns with continuing to maintain captive manatees in the spring run: (1) sloughed skin from infected captive animals could drift down the spring run and expose wild animals to the virus, (2) the Commission continues to believe that the warmest water of the spring run should be made fully accessible to wild manatees by removing the fence, and (3) it appears that the health of the captive animals would best be served by moving them to other facilities. In this regard, some scientists have suggested that year-round maintenance in waters that stay a constant 22 °C may not be optimal for manatees and could contribute to expression of the virus. That is, although 22 °C may be adequate

for allowing manatees to survive relatively brief cold winter periods, access to warmer waters above 22 °C for most of the year may help suppress expression of the papilloma virus.

In view of these concerns, the Commission expected to write to the Service early in 2005 in support of efforts to move the captive animals in the spring run to other facilities or to a new isolation pool recently built at the park. The Commission also expected to recommend that the Service and park managers remove the fence blocking wild manatee access to the head of the spring run one year after removing the captive animals. A one-year delay in removing the fence seems warranted to minimize the risk of infecting wild manatees with viruses that may be shed on sloughed skin and sequestered in spring run sediments and other objects.

### **The Florida Manatee Recovery Team**

Representatives of the Marine Mammal Commission also participated on two other recovery team working groups: the Steering Committee and the Manatee Population Status Working Group. During 2004 the Steering Committee met several times to review and coordinate the activities of the various recovery team groups. Among other things, the committee initiated steps to convene a meeting of the full recovery team in the spring of 2005. This will be the first meeting of the full recovery team since it was reconstituted and expanded late in 2001. The Population Status Working Group also met several times to develop the first of what is planned to be an annual statement and analysis on the status of the Florida manatee population based on the most recent scientific data available. At the end of 2004 the working group was completing its statement and expected to transmit it to the Fish and Wildlife Service early in 2005.

## **Beaked and Bottlenose Whales (Family Ziphiidae)**

Ziphiids, commonly known as the beaked and bottlenose whales, are one of the least-known families of marine mammals. This taxonomic family, referred to collectively as the beaked whales, includes 21 species in six genera (see Table 6). Although scientists described the first member of the family in 1770, these elusive deep divers are still generally poorly known, and the latest new species was identified in 2001.

Beaked whales are found in all the world's oceans and are believed to prefer deep-water habitats although this hypothesis has not been thoroughly tested for any species. The distribution of most beaked whale species is known largely from stranding records and limited surveys, because these animals are notoriously difficult to find and identify at sea. Several species have never been reliably identified at sea. In general, marine mammal surveys and other studies have revealed distribution patterns that seem to reflect a preference for habitats such as shelf edges, submarine canyons, seamounts, and oceanographic features that may concentrate prey, such as deep-water species of fish and squid.

### **Abundance, Status, and Threats**

No beaked whales are listed as depleted under the Marine Mammal Protection Act or as threatened or endangered under the Endangered Species Act. For most ziphiids, there are no reliable estimates of abundance, minimum population size, potential biological removal level, or stock status. However, the National Marine Fisheries Service has produced stock assessment reports for some species, and these are summarized in Table 7.

Uncertainty in field identification of most ziphiids, especially for smaller species, has made it difficult to estimate their abundance. Studies to date have shown that beaked whales typically spend very little time at the surface, taking only two or three minutes at the surface between 15- to 45-minute dives.

In addition, most species are inconspicuous when at the surface, lacking a distinctive blow and rarely displaying their flukes before diving. Underwater recordings of beaked whale vocalizations may help in the development of new methods to detect beaked whales while they are submerged, but much additional work is needed before acoustic detection techniques can be applied.

Recent highly publicized mass strandings of beaked whales have increased concern about the status of beaked whale populations, with particular attention given to the role of anthropogenic sound sources in these events. For further discussion of the potential impacts of anthropogenic sound on beaked whales, see Chapter IV of this report.

The National Marine Fisheries Service reports that from 1992 to 2000, approximately 28 Gervais' beaked whales, two True's beaked whales, five Blainville's beaked whales, one Sowerby's beaked whale,

**Table 6. Species of the Family Ziphiidae (the ziphiids): beaked and bottlenose whales**

<b>Species</b>	<b>Common Name</b>	<b>Distribution</b>
<i>Berardius arnuxii</i>	Arnoux's beaked whale	Subantarctic and Antarctic waters
<i>B. bairdii</i>	Baird's beaked whale, giant bottlenose whale, North Pacific bottlenose whale	Cold/temperate waters in the North Pacific
<i>Hyperoodon ampullatus</i>	North Atlantic bottlenose whale, northern bottlenose whale, bottle-nosed whale	Temperate, subarctic, and arctic North Atlantic
<i>H. planifrons</i>	southern bottlenose whale, Antarctic bottle-nosed whale, flatheaded bottlenose whale	Throughout the Southern Hemisphere
<i>Indopacetus pacificus</i>	Longman's beaked whale, Indo-Pacific beaked whale	Known from only six specimens; western tropical Pacific Ocean, tropical Indian Ocean
<i>Mesoplodon bidens</i>	Sowerby's beaked whale, North Atlantic beaked whale, North Sea beaked whale	Temperate North Atlantic
<i>M. bowdoini</i>	Andrews' beaked whale, deepcrest beaked whale	Known only from stranding records; southern Indo-Pacific
<i>M. carlhubbsi</i>	Hubbs' beaked whale, archbeaked whale	Temperate North Pacific
<i>M. densirostris</i>	Blainville's beaked whale, densebeaked whale, densebeak whale	Warm-temperate, subtropical, and tropical waters worldwide
<i>M. europaeus</i>	Gervais' beaked whale, Antillean beaked whale, Gulf Stream beaked whale	Warm-temperate and tropical Atlantic, including the Gulf of Mexico
<i>M. ginkgodens</i>	ginkgo-toothed beaked whale	Known only from stranding records; tropical and warm-temperate Indo-Pacific
<i>M. grayi</i>	Gray's beaked whale, Haast's beaked whale, scamperdown whale, small-toothed beaked whale	Temperate waters of Southern Hemisphere, Antarctic waters
<i>M. hectori</i>	Hector's beaked whale	Known only from stranding records; temperate waters of Southern Hemisphere, excluding southeastern Pacific
<i>M. layardii</i>	strap-toothed whale, Layard's beaked whale, long-toothed beaked whale	Southern Hemisphere
<i>M. mirus</i>	True's beaked whale	Temperate North Atlantic and Southern Hemisphere; apparent isolated populations
<i>M. perrini</i>	Perrin's beaked whale	Known from only five specimens off California; North Pacific
<i>M. peruvianus</i>	lesser beaked whale, pygmy beaked whale, Peruvian beaked whale	Known only from Gulf of California to Peru; probably eastern tropical Pacific
<i>M. stejnegeri</i>	Stejneger's beaked whale, Bering Sea beaked whale, saber-toothed whale	Cold-temperate and subarctic North Pacific
<i>M. traversii</i>	spade-toothed whale	Known from only three specimens; New Zealand and Chile
<i>Tasmacetus shepherdi</i>	Tasman beaked whale, Shepherd's beaked whale	Known from only few specimens and possible sightings; probably throughout temperate Southern Hemisphere
<i>Ziphius cavirostris</i>	Cuvier's beaked whale, goose-beaked whale, goosebeak whale	Worldwide; temperate, subtropical, and tropical waters

**Table 7. Summary of NMFS stock assessment reports available for ziphiids<sup>1</sup>**

Stock	Date of Report	Minimum Population Estimate <sup>1</sup>	Current Population Trend	Potential Biological Removal
<i>B. bairdii</i> CA/OR/WA stock	2003	152 <sup>2</sup>	Unknown, although 1991–1996 abundance estimates were higher	1.5
<i>M. densirostris</i> HI stock	2003	43 <sup>3</sup>	Unknown	0.4
<i>M. densirostris</i> <sup>4</sup> N. Gulf of Mexico stock	2003	Unknown <sup>5</sup>	Unknown, although 1994 abundance estimates for undifferentiated beaked whales in this region lower than in 1991–1993	Unknown <sup>6</sup> ; designated a strategic stock under the Marine Mammal Protection Act
<i>M. europaeus</i> <sup>4</sup> N. Gulf of Mexico stock	2003	Unknown <sup>5</sup>	Unknown, although 1994 abundance estimates for undifferentiated beaked whales in this region lower than in 1991–1993	Unknown <sup>6</sup> ; designated a strategic stock under the Marine Mammal Protection Act
<i>Mesoplodon</i> spp. (undifferentiated) CA/OR/WA stock	2003	645 <sup>2</sup>	Unknown, although 1991–1996 abundance estimates were higher	6.5
<i>Z. cavirostris</i> CA/OR/WA stock	2003	1,121 <sup>2</sup>	Unknown, although 1991–1996 abundance estimates were higher	11
<i>Z. cavirostris</i> HI stock	2003	29 <sup>3</sup>	Unknown	0.3
<i>Z. cavirostris</i> N. Gulf of Mexico stock	2003	65 <sup>2</sup>	Unknown	0.7; designated a strategic stock under the Marine Mammal Protection Act
<i>Z. cavirostris</i> Western N. Atlantic stock	2002	Unknown <sup>7</sup>	Unknown	Unknown <sup>8</sup> ; designated a strategic stock under the Marine Mammal Protection Act

<sup>1</sup> Minimum population estimate for the Alaska stock of *B. bairdii* (1999), the western North Atlantic stock of *M. densirostris* (1995), the Alaska stock of *Z. cavirostris* (1999), the western North Atlantic stock of *M. europaeus* (1995), the western North Atlantic stock of *Mesoplodon* spp. (2002), the western North Atlantic stock of *H. ampullatus* (1998), the western North Atlantic stock of *M. bidens* (1995), the Alaska stock of *M. stejnegeri* (1999), and the western North Atlantic stock of *M. mirus* (1995).

<sup>2</sup> For 1996–2001 abundance estimate.

<sup>3</sup> For 1993–1998 abundance estimate.

<sup>4</sup> Data only available for undifferentiated *Mesoplodon* spp. in this region.

<sup>5</sup> Minimum population estimate for all undifferentiated *Mesoplodon* spp. in this region is 76 animals.

<sup>6</sup> Potential biological removal for all undifferentiated *Mesoplodon* spp. in this region is 0.8 animals.

<sup>7</sup> Minimum population estimate for all undifferentiated *Ziphius* and *Mesoplodon* spp. in this region is 2,419 animals.

<sup>8</sup> Potential biological removal for all undifferentiated *Ziphius* and *Mesoplodon* spp. in this region is 24 animals.

13 Cuvier's beaked whales, and four undifferentiated ziphiids stranded along the Atlantic coast of the United States between Florida and Massachusetts. In most cases, a cause of mortality could not be assigned.

Few data are available on beaked whale mortalities from fisheries interactions. The Service's stock assessment reports indicate that Baird's, Hubbs', Stejneger's, and Cuvier's beaked whales have been taken

rarely in the California drift gillnet fishery, and a total of 46 Cuvier's, Sowerby's, True's and undifferentiated *Mesoplodon* beaked whale mortalities were reported in the now-defunct pelagic drift gillnet fishery off the Atlantic coast of the United States between 1989 and 1998. No mortalities have been reported by Service observers in the pelagic longline, pelagic pair trawl, Northeast multispecies sink gillnet, mid-Atlantic coastal gillnet, or North Atlantic bottom trawl fisheries. Some beaked whale species were taken in whaling operations, including Baird's beaked whales off California and British Columbia between 1950 and 1970, northern bottlenose whales off Atlantic Canada until the 1970s, and Cuvier's beaked whales off the Lesser Antilles. The long-standing coastal fishery for Baird's beaked whales off Japan once took up to 400 animals a year although more recent annual harvests have been approximately 20 whales. The population-level impacts of fisheries interactions and whaling operations on beaked whales are unknown.

Little is known about other potential threats to beaked whales. A variety of natural and anthropogenic factors may affect their health, behavior, or survival. Studies of their abundance, distribution, behavior, ecology, anatomy, and physiology are needed to assess their status and develop adequate monitoring, management, and mitigation strategies.

### **Beaked Whale Technical Workshop**

The Commission held a technical workshop on beaked whales 13–16 April 2004 in Baltimore, Maryland. The workshop's goals were to (1) assess current knowledge of recent stranding events involving beaked whales and their biology and ecology, (2) identify and characterize factors that may have caused those strandings, (3) identify data needed to investigate possible causal relationships, and (4) recommend research, management, and mitigation strategies specific to beaked whales and acoustic impact. The workshop was open to the public, and approximately 50 observers attended along with the 32 invited participants. The Commission produced a brief summary of the workshop for use by its Advisory Committee on Acoustic Impacts on Marine Mammals and has prepared a workshop report. The Commission also solicited background papers for the workshop, covering the following topics: (1) properties of the underwater sound fields during some well-documented beaked whale mass stranding events, (2) a summary review of the behavior and ecology of

beaked whales, (3) known and inferred distributions of beaked whale species, (4) abundance, density, and habitat of beaked and bottlenose whales, (5) elements of beaked whale anatomy and diving physiology and some hypothetical causes of sonar-related stranding, and (6) mitigation and monitoring. The workshop report and papers will be published in *The Journal of Cetacean Research and Management*.

Participants agreed on two major findings: (1) whereas no potential mechanisms for the effect of sound on beaked whales can be eliminated, the scenario involving gas bubble disease induced through a behavioral response is particularly worthy of further consideration, and (2) current monitoring and mitigation methods for beaked whales are ineffective. In addition, workshop participants unanimously supported controlled exposure experiments as the top research priority for gathering critical information on beaked whale responses to sound. Participants also agreed that a workshop involving scientists across several disciplines should be held to coordinate and design controlled exposure experiments that would obtain the most useful information possible without causing harm to beaked whales.

Participants also agreed to three other areas of priority research among the several recommended topics needing study: (1) anatomy, physiology, and pathology of beaked whales (particularly in situations that may be related to sound exposure), as well as behavioral responses of live beaked whales to sound, (2) baseline diving behavior and physiology of beaked whales, and (3) retrospective review of beaked whale strandings. There was also strong support for developing a more comprehensive and internationally standardized protocol to make the best possible use of animals that become available due to stranding or fisheries interactions. An informal subgroup was formed to develop specific protocol components.

Finally, workshop participants identified areas in education, communication, and coordination that require attention. The group recommended that public outreach and education be accomplished through various means and that there be improved coordination and communication among and between marine mammal scientists, stranding responders, sound-producing entities, museums, and terrestrial mammal physiologists to advance current techniques and understanding. The workshop's results emphasized the importance of interdisciplinary coordination, communication, and the exchange of knowledge.

## Chapter IV

### SPECIAL PROJECTS

From time to time, the Marine Mammal Commission takes on special projects that either Congress or the Commission deems 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 following sections of this chapter provide an overview of four special projects that the Commission is currently undertaking.

#### **Effects of Anthropogenic Sound on Marine Mammals**

Sound is a common element of the marine environment, originating from a variety of natural and anthropogenic sources. Rain, wind, waves, lightning strikes, underwater volcanoes and earthquakes, and marine organisms all produce natural sounds that contribute to the ambient noise in oceans. In some cases, such sounds may transmit over many miles. Humans introduce sound into the marine environment incidental to activities such as coastal construction, oil and gas exploration and extraction, shipping, commercial and sport fishing, and other vessel use. Humans also introduce sound intentionally, using sonars, seismic arrays, fish finders, and other tools as a way to “see” and better understand or exploit the marine environment. The amount of sound in the ocean is increasing as human activities expand and intensify. As this occurs, scientists and the public are increasingly concerned about the potential impact of anthropogenic sound on marine mammals.

Underwater sounds of both human and natural origin may affect the behavior and, in some circumstances, the survival and productivity of individual marine mammals. Not enough is known at this time to determine the magnitude of the impact of anthropogenic sound on marine mammals. As the National Research Council of the National Academy of Sciences concluded in a recent report, “On the one hand, sound may represent only a second-order effect on the conservation of marine mammal populations; on the other hand, what we have observed so far may be only the first early warnings or ‘tip of the iceberg’ with respect to sound and marine mammals.” The nature and significance of the effects depend on a number of factors, such as the intensity, frequency, and duration of the sound; the location of the sound source relative to the potentially affected animals and key features of their habitat; whether the sound source is moving or stationary; the species, age, sex, reproductive status, activity, and hearing ability of the animals exposed to the sounds; whether the animals use similar sounds for communication, locating and capturing prey, sensing their environment, etc.; and whether and how frequently the animals have been exposed previously to the sounds.

When the Marine Mammal Protection Act was enacted in 1972, there were few indications that underwater sounds of human origin could adversely affect marine mammals, either directly or indirectly through effects on other ecosystem components. However, by the late 1970s researchers began to document that marine mammals could be affected in a variety of ways by anthropogenic sound. Possible effects range from minor behavioral modifications to permanent or temporary hearing loss to stranding or physical trauma that may result in death. Increasing anthropogenic noise from episodic and continuous sources can

also mask natural sounds that marine mammals use to communicate, find food, or otherwise sense the surrounding environment, potentially leading to effects on reproduction and survival.

Over the past three decades, the issue of how anthropogenic sound may affect marine mammals and their habitat has become highly controversial. Although much has been learned about the effects of anthropogenic sounds on marine mammals and their environment, available information is often insufficient to assess accurately how existing sound sources may be affecting, or how new sound sources may affect, marine mammals and other components of marine ecosystems. Uncertainty about the effects of various sound sources confounds management efforts to protect marine mammals and marine ecosystems while avoiding unnecessary constraints on those activities that generate the sound.

Additional information about the issue of anthropogenic sound, including discussions of the controversies surrounding certain military activities and geophysical seismic research, are provided in the Commission's previous annual reports. This chapter describes the most notable events in 2004 related to the effects of sound on marine mammals.

### **Military Sonar**

Recent mass strandings of beaked whales and other species have increased concern about the effects of military sonar on beaked whales (family Ziphiidae). Although it is often difficult or impossible to determine the precise cause of strandings, continued reports and observations depict a pattern of mass strandings of cetaceans associated with military sonar use.

The most highly publicized of these events occurred in the Bahamas in March 2000 and in the Canary Islands in September 2002. These strandings were discussed in depth in the Commission's 2002 and 2003 annual reports, respectively. The joint interim report on the Bahamas event, released by the U.S. Navy and National Marine Fisheries Service in December 2001, concluded that mid-frequency tactical sonars were likely a causal factor in the strandings and eventual deaths of at least six beaked whales. Reports of the Canary Islands strandings released by the University of Las Palmas de Gran Canaria and the Canary Islands Department of the Environment in 2003 concluded that observed injuries were consistent with acoustic trauma as described in the Bahamas joint

interim report. An October 2003 letter to the journal *Nature* hypothesized that gas-bubble lesions found in the organs of some of the whales stranded in the Canary Islands may represent a form of decompression sickness possibly induced by sound exposure. However, the precise mechanisms leading to the beaked whale strandings are unknown, as is the impact on the populations involved. In November 2004 Spain reacted to a recent series of whale mortalities in the Canary Islands by announcing a moratorium on the military use of active sonar in waters around two islands, Lanzarote and Fuerteventura, out to a distance of 50 km.

In April 2004 the Marine Mammal Commission sponsored a technical workshop to examine the apparent vulnerability of beaked whales to anthropogenic sound. Additional information about the workshop is found in Chapter III. Although much of the recent concern regarding the coincidental association between strandings and the use of military sonar has focused on beaked whales, other species also may be at risk.

In May and June 2003 several harbor porpoises (*Phocoena phocoena*) stranded throughout Puget Sound. The USS *Shoup* was testing its mid-frequency AN/SQS-53C sonar in nearby Haro Strait on 5 May 2003. This event was described in detail in the previous annual report. From 2 May to 2 June 2003 the Northwest Marine Mammal Stranding Network received reports of 15 dead harbor porpoises (3 of which stranded before 5 May) and 1 dead Dall's porpoise (*Phocoenoides dalli*) along the outer coast in the Strait of Juan de Fuca and in the vicinity of Whidbey Island and San Juan Island. This was a higher number of harbor porpoise strandings when compared with data from past years for the same months. Researchers and private citizens in the area reported behavioral changes in whales and porpoises concurrent with the USS *Shoup* transiting Haro Strait between Vancouver Island (Canada) and San Juan Island (United States) on 5 May 2003. An expert team of biologists conducted necropsies on 11 of the porpoises. The analyses were hindered due to the condition of the carcasses. According to preliminary reports released by the National Marine Fisheries Service and U.S. Navy, auditory trauma was ruled out in five of the animals. For the remaining six animals, the cause of death could not be determined, mainly due to decomposition.

The National Marine Fisheries Service's October 2004 final report concluded that "A presumptive

cause of death was determined in five of 11 harbor porpoises that were examined and/or scanned. Lesions consistent with or diagnostic for acoustic traumas were not identified in any of the 11 porpoises examined. The multidisciplinary team noted that lesions consistent with acoustic trauma can be difficult to interpret or obscured, especially in animals in advanced postmortem decomposition. The possibility of acoustic trauma as a contributing factor in the mortality of the porpoises examined cannot be ruled out.”

On 3 July 2004 a pod of around 200 melon-headed whales (*Peponocephala electra*), a species that usually inhabits deep water, entered Hanalei Bay on the north coast of Kauai in the Hawaiian Islands. Four Japanese and two U.S. Navy ships were conducting active sonar exercises more than 70 nautical miles (nmi) southeast of Kauai on 2 July and more than 25 nmi northwest of Kauai on 3 July. Upon learning of the whales’ behavior from the National Marine Fisheries Service, the Navy halted the use of active sonar. The pod was herded from the bay by National Marine Fisheries Service officials, regional stranding network participants, and volunteers on 4 July. One neonate stranded dead in the bay on 5 July. The National Marine Fisheries Service is conducting an investigation of this event, but no official report had been released at the end of 2004.

In February 2004 the European Cetacean Society published the proceedings of its Workshop on Active Sonar and Cetaceans, held in Las Palmas, Gran Canaria, in March 2003. Among the topics considered were techniques for measuring hearing through auditory brainstem response studies, the possibility of undertaking controlled exposure experiments to investigate dose-response relationships, the use of passive and active acoustic monitoring for detection of marine mammals, and options for mitigating the impact of naval sonar on beaked whales. Participants reviewed information about pathological conditions in beaked whales potentially related to acoustic trauma, and about various strandings. The report concluded that investigations of mass-stranded cetaceans immediately following naval activities provided evidence that acoustic trauma or behavioral responses leading to injury were in some way related to the strandings. The report also discussed various theories to explain the presence of pathologies similar to decompression sickness in the beaked whales examined from the 2002 Canary Islands event. Workshop participants noted that beaked whales appear to be most suscepti-

ble to anthropogenic sound, and that Cuvier’s beaked whale (*Ziphius cavirostris*) may be particularly vulnerable. They also noted that the unusual occurrence of two minke whales (*Balaenoptera acutorostrata*) stranding alive (Bahamas 2000) suggests that baleen whales may also be affected by anthropogenic sound under certain circumstances.

There was general agreement at the European Cetacean Society workshop on the need for increased cooperation and information transfer among biologists and navies. The report also called for more research on the various components of the issue and recommended that the possibilities of undertaking controlled exposure experiments and auditory brainstem response studies, in particular, should be explored further. Those conclusions were similar to those resulting from the Commission’s beaked whale technical workshop in April 2004 (see Chapter III).

The International Whaling Commission (IWC) Scientific Committee’s Standing Working Group on Environmental Concerns held a mini-symposium on acoustics at its July 2004 meeting in Sorrento, Italy. A series of papers was presented, including some related to active sonar. One discussed stranding records for Cuvier’s beaked whales in Japan since the 1950s. The report revealed 10 mass strandings involving 47 animals as well as 64 stranded individuals in the record. Although individual strandings occurred throughout the Japanese archipelago, all of the mass strandings occurred in either Suruga Bay or Sagami Bay on the central Pacific coast of Honshu. Sagami Bay is located west and south of Tokyo Bay, and the two are connected by a narrow opening. The mass strandings occurred in close proximity to the city of Yokosuka, which is near the mouth of Tokyo Bay and is the command base for operations of the U.S. Navy’s Pacific Seventh Fleet. Yokosuka is also a major port. U.S. Navy ships use Yokosuka as their homeport or transit through Yokosuka while deployed to the western Pacific. However, it is not known whether any ships conducted sonar operations or tests in this area coincidental to the mass strandings. Therefore, existing evidence is not sufficient to determine if military sonar was a factor in these strandings. However, the IWC Scientific Committee found the spatial overlap to be suggestive of that possibility. A separate paper presented information on several unusual cetacean stranding events that occurred in Chinese waters in 2004 concurrent with naval exercises in nearby waters south of Taiwan.

### Seismic Surveying

In March 2003 the Minerals Management Service, which regulates U.S. oil and gas exploration and development, requested the promulgation of regulations under section 101(a)(5)(A) of the Marine Mammal Protection Act that would authorize seismic contractors to take by harassment small numbers of several species of marine mammals incidental to conducting seismic surveys during oil and gas exploration activities in the Gulf of Mexico. The National Marine Fisheries Service received the Minerals Management Service's final programmatic environmental assessment for this request, along with the petition for a rulemaking, in July 2004. The National Marine Fisheries Service has determined that an environmental impact statement will be required for the rulemaking. At the end of 2004 the National Marine Fisheries Service had not yet started work on this document. Additional information about permitting and authorization activities related to seismic surveying efforts, including the Commission's comments and recommendations, is presented in Chapter IX.

The IWC Scientific Committee's Standing Working Group on Environmental Concerns discussed several papers related to the potential effects of seismic surveys at its mini-symposium on acoustics in July 2004. One paper reported on seismic survey activity coincidental with an increase in strandings of adult humpback whales (*Megaptera novaeangliae*) on the coast of Brazil near the breeding grounds of the Abrolhos Bank. Eight strandings of adult humpback whales were reported during the 2002 breeding season, representing nearly 27 percent of the total adult stranding reports in Brazil between 1975 and 2003. During the same time, seismic surveys were being conducted, under permits from the Brazilian Environmental Agency, in the Abrolhos Bank breeding grounds. Although detailed necropsies could not be performed on the animals, there was no clear evidence of entanglement or collision with vessels (the most common causes of whale strandings in the region). After the humpback whale strandings in 2002, several nongovernmental organizations initiated a public awareness campaign and provided the Brazilian Environmental Agency with scientific information. The Brazilian government then excluded this area from an auction of blocks for oil exploration and exploitation and suggested the adoption of mitigation measures for seismic surveys. At the Commission's international workshop on sound and marine

mammals in September 2004 (discussed below), the International Association of Geophysical Contractors presented an analysis of the paper presented at the 2004 IWC meeting. It asserted that the paper did not establish a relationship between strandings and seismic activity and called into question the Brazilian government's policy with respect to seismic surveying on Abrolhos Bank. Participants in the IWC meeting also discussed information suggesting that seismic studies had displaced western North Pacific gray whales (*Eschrichtius robustus*) from a primary feeding area off Sakhalin Island, as well as the increase in seismic exploration activity throughout the North Atlantic and along the west coast of Africa.

### NRC Committee on Biologically Significant Behavior

The National Research Council (NRC) recently sponsored the Committee on Characterizing Biologically Significant Marine Mammal Behavior, which presented its work to the NRC's Ocean Studies Board in October 2004. The definition of "biological significance" under the Marine Mammal Protection Act's legal framework has been a matter of recent scientific and political debate, particularly with respect to management of the effects of anthropogenic sound. The Committee was therefore directed to review relevant literature and develop a report describing the point at which behavioral changes resulting from human activities become biologically significant. The group focused particularly on clarifying the scientific basis for management determinations about behavioral or physiological responses in individuals that are biologically significant for populations. The Committee concluded that, although there are many documented responses of marine mammals to anthropogenic sound, it is unknown how or in what cases these changes rise to the level of biologically significant effects. They further determined that no scientific studies to date have conclusively documented a link between sound exposure and population-level effects. It is not clear whether anthropogenic sound is a serious problem in its own right or only a second-order effect. Regardless of biological significance, however, the Committee acknowledged the need to minimize conflict between human uses of the oceans and marine mammals.

Cause-and-effect relationships, as well as the significance of various threats, are difficult to assess even for humans, which are relatively easy to

study and receive substantial attention. With respect to marine mammals, demonstrating that behavioral changes can lead to altered foraging efficiency, habitat abandonment, declines in reproduction, or other biologically significant effects is extremely challenging, given the limited information available and the difficulty in studying them. To address this challenge, the Committee provided suggestions for immediate, mid-term, and long-term ways for managers to determine if sound-producing activities will have a biologically significant impact on marine mammal populations in any particular situation. The Committee recommended that managers set limits regarding any particular problem by describing the best- and worst-case scenarios given available information, and the Committee set forth a conceptual model to help guide future study. The model, which the Committee recommended be developed within a year, would culminate in the creation of an Internet-based “intelligent system” for managers to determine a de minimus standard below which the predicted impact of activities is clearly not significant.

The Committee also recommended that the potential biological removal (PBR) model, which has been used to regulate the impact of fisheries on marine mammals, might be extended to address cumulative impact of other human activities, including sound production. It developed a scheme of injury and behavioral “take equivalents” that would be used to equate sublethal effects with one “take” under the PBR scheme by using a “severity index” that estimates the fraction of a take experienced by one animal. This approach assumes that the primary effects of harassment involve lost energy, time, and opportunity costs (e.g., to feed), and that the severity index would be higher for activities taking place during a critical time or at a critical location (e.g., in breeding habitat). The Web-based intelligent system proposed by the Committee would incorporate this new PBR-based scheme with the National Marine Fisheries Service’s noise exposure criteria currently being developed. An expert opinion panel would be used to develop the system.

The Committee made several recommendations including completing the work recommended in the three previous NRC reports on this subject; continuing to develop the conceptual model, using it to identify key variables that determine outcomes; creating a centralized database for marine mammal sightings and responses to anthropogenic sound in the ocean;

supporting development (by relevant resource agencies) of standardized reporting formats for marine mammal data collection; developing techniques for evaluating chronic impacts of sound (e.g., stress); using certain better-known marine mammal populations to test models and develop techniques; assessing the likelihood of adverse effects on populations (e.g., using a precautionary management approach such as the PBR system used under the Marine Mammal Protection Act); and improving the use of the PBR model in management to reflect cumulative impacts and total losses from all sources of mortality. The Committee’s report is expected in January 2005.

### **IWC Symposium on Acoustics**

At the 2003 meeting of the Scientific Committee of the International Whaling Commission (IWC), the Standing Working Group on Environmental Concerns noted the importance of the emergent threat of anthropogenic sound to cetaceans and other elements of marine ecosystems. In response, the working group held a mini-symposium on acoustics just before the IWC meeting in July 2004. The mini-symposium addressed several key components of this issue, taking advantage of previous and ongoing workshops and symposia specifically convened on this topic. Invited scientists gave presentations on mass strandings potentially related to either naval activities or seismic surveys, ambient noise levels, and the effects of anthropogenic sound on marine mammals. The conclusions and recommendations from the mini-symposium were presented to the Scientific Committee, which in turn drafted a report with recommendations for the IWC. Both the Scientific Committee and the IWC agreed that there is now compelling evidence implicating military sonar as having a direct impact on beaked whales, in particular. They further agreed that there is evidence of increasing sound levels from other sources, including ships and seismic activities, which is cause for serious concern. Although noting that considerably more scientific work is needed, the Scientific Committee emphasized that measures to protect species and habitats cannot wait for scientific certainty.

On the general topic of the impact of anthropogenic sound on cetaceans, the IWC adopted the Scientific Committee’s recommendations for (1) the integration and coordination of international research projects to study and describe acoustic ecologies; (2) the inclusion of anthropogenic noise assessments and

noise exposure standards within the framework of national and international ocean conservation plans (e.g., consideration during designation of critical habitats, marine protected areas and ocean zoning); and (3) support for multinational programs to monitor ocean noise and the assessment of underwater noise characteristics at various scales.

The IWC endorsed several research recommendations with respect to beaked whales and the use of military sonar, including the need for (1) a full review of typical and atypical strandings; (2) a full analysis of stranding data relative to military activities; (3) thorough, standardized postmortems of entire animals at mass strandings; (4) standardized responses and protocols for documenting and understanding mass stranding events; (5) an investigation of the correlation of natural sounds (e.g., earthquakes, typhoons) with the mass strandings of beaked whales; and (6) surveys for Cuvier's beaked whales off the Pacific coast of Japan where these whales were hunted and where mass strandings have occurred.

The IWC also endorsed recommendations relating to mitigation and monitoring protocols, recommending them to member governments and requesting that they be transmitted to representatives of geophysical exploration and petroleum industries and various committees and agencies, including but not limited to the Marine Mammal Commission and the National Marine Fisheries Service. The IWC recommended, among other things, that (1) global effort be expended to identify and monitor critical habitats for cetaceans; (2) access be given to information on timing, distribution, extent, sound source, and sound source characteristics for past and planned seismic surveys carried out within the range of critical habitats or potential critical habitats; (3) descriptions and results of any marine mammal observer programs or other faunal observation programs carried out in conjunction with previous seismic surveys be provided; (4) continuous acoustic monitoring of critical habitats be undertaken on sufficient temporal and spatial scales in relation to pre- and post-seismic activity; (5) independent monitoring of critical habitats (from survey vessel and independent platforms) be undertaken to evaluate displacement from critical habitat and/or disruption of important cetacean behaviors in the critical habitat; (6) increased effort be undertaken to monitor strandings that occur at times and in places where seismic activity is conducted; and (7) seismic

operators seek ways to mitigate their potential impact (e.g., to reduce the power of their sources).

The IWC expressed concern about the impact of seismic impulses on large whales in critical habitats, particularly with respect to severely threatened populations such as the western stock of gray whales. This concern resulted in resolution 2004-1 on western Pacific gray whales, which, among other things, calls upon range states and others to continue active pursuit of all practicable actions to eliminate anthropogenic mortality for this stock and to minimize anthropogenic disturbances in the migration corridor and on breeding and feeding grounds. The IWC made several other recommendations related to western Pacific gray whales, including that (1) all seismic surveys in areas that could have significant adverse demographic consequences for large whales be done when whales are not present; (2) in cases when seismic surveys do occur in an important habitat (e.g., western gray whale feeding area off Sakhalin Island), additional guidelines for seismic surveys and independent scientific monitoring be developed and a strict monitoring and mitigation program be implemented, including independent observers and monitoring platforms; (3) in situations when displacement of whales could have significant demographic consequences, seismic surveys not be allowed; (4) measures be taken to protect the western gray whale population and its habitat off Sakhalin Island; (5) the ongoing Russian-U.S. and Russian and Republic of Korea national programs on western gray whale research and monitoring be continued and expanded; and (6) all range states develop or expand national monitoring and research programs on western gray whales.

### **European Parliament Resolution**

In October 2004 the European Parliament passed a resolution that, among other things, called for the European Union and its member states to adopt a moratorium on the deployment of high-intensity active naval sonars until a global assessment of their cumulative environmental impact has been completed. The resolution also called on the member states to (1) immediately restrict the use of high-intensity active naval sonars in waters under their jurisdiction; (2) monitor and investigate (in a transparent manner) mass strandings of marine mammals in European Union waters that have been associated with intense anthropogenic sound and communicate the findings

to the European Commission; and (3) set up a multinational task force with the European Commission to develop international agreements regulating sound levels in the world's oceans, with the goal of limiting the adverse impact of anthropogenic sound on marine mammals and fish. Although European Parliament resolutions are non-binding, they serve to raise awareness in the European Community and to bring issues to the European Commission agenda.

### **IUCN—The World Conservation Union Resolution**

At its 3rd World Conservation Congress in November 2004, IUCN—The World Conservation Union passed a resolution recognizing that, depending on source and intensity, anthropogenic ocean noise is a form of pollution that may have adverse effects on the marine ecosystem. The resolution called for the reduction of anthropogenic ocean noise around the world and encouraged further research on the effects and mitigation of anthropogenic noise on marine species at the highest standards of science and public credibility. Among other things, the resolution also called upon the IUCN constituency to recognize that, when there is reason to expect that harmful effects on biota may be caused by such noise, lack of full scientific certainty should not be used as a reason for postponing measures to prevent or minimize such effects. It entreated IUCN member governments to use available mechanisms of domestic and international law (including the development of legal instruments) to (a) monitor for and investigate (in a publicly open, inclusive, and transparent manner) the impact of intense anthropogenic noise on marine species, including but not limited to mass strandings and deaths; (b) encourage the development of alternative technologies and require the use of best-available control techniques and other mitigation measures in reducing the impact from individual noise sources; (c) consider ways to limit the use of powerful noise sources until their short-term and long-term effects are better understood, and, to the maximum extent possible, to avoid the use of such sources in habitat of vulnerable species and in areas where marine mammals or endangered species may be concentrated; (d) act with particular urgency in the case of military active sonar to reduce the impact on beaked whales and other potentially vulnerable species by restricting training to low-risk areas and by working diligently toward the development of international standards that regulate

its use; (e) consider noise restrictions in their management guidelines for marine protected areas; and (f) work together with national and international non-governmental organizations and with the scientific community in accomplishing these goals.

The United States abstained from voting on the resolution and took no national position. However, the U.S. Department of State provided a statement for the record at the meeting, which clarified that the U.S. Government (1) is concerned with the potential effects of anthropogenic sound on marine life and recognizes that some anthropogenic sound may have adverse effects, ranging from chronic to acute, on marine life; (2) is a leader in funding research on all aspects of the issue and in implementing science-based management programs to assess and mitigate the adverse effects of some anthropogenic sound on marine mammals and endangered and threatened species; (3) supports continued reliance on science in regulatory decision-making about activities associated with anthropogenic sound; and (4) encourages an international approach to promote scientific understanding of this issue and science-based means of addressing adverse effects.

### **ASCOBANS Resolution**

At their fourth meeting in August 2003, the Parties to the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS) passed a resolution on the effects of noise and vessels. The resolution, among other things, requested that the parties and range states introduce guidelines on measures and procedures for seismic surveys to prevent significant disturbance of cetaceans. Parties and range states were also invited to conduct research and report on approaches to reduce or eliminate adverse effects of military activities on small cetaceans before the ASCOBANS Advisory Committee meeting in 2005.

### **ACCOBAMS Resolution**

At their second meeting, held in November 2004, the Parties to the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS) adopted a resolution on the assessment and impact assessment of manmade noise. Resolution 2.16, among other things, urged that (1) within the ACCOBAMS area, the use of anthropogenic sound be avoided if appropriate in marine mammal habitat and any use of anthropogenic sound in or near areas believed to be

the habitat of Cuvier's beaked whales be undertaken only with special caution and transparency; (2) the parties facilitate national and international research on various aspects of the issue; (3) the parties provide the ACCOBAMS Scientific Committee with public, national, or international protocols or guidelines for sonar use developed by military authorities in the context of addressing threats to cetaceans, along with the information upon which they are based; and (4) the parties consult with entities conducting activities known to produce underwater sound with the potential to cause adverse effects on cetaceans, recommending that extreme caution be exercised in the ACCOBAMS area. The resolution also encouraged the development of alternative technologies and requirements for the use of best available control technologies and other mitigation measures in order to reduce the impact of anthropogenic sound in the ACCOBAMS area.

### **Marine Mammal Commission Sound Policy Dialogue**

In the Omnibus Appropriations Act of 2003 (Pub. L. 108-7), Congress 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 hopes of moving beyond the adversarial interactions that had historically characterized work on this issue, the Commission hired a team of neutral conflict resolution facilitators through the U.S. Institute for Environmental Conflict Resolution to help construct and manage a multi-stakeholder dialogue focused on addressing the impacts of anthropogenic sound on marine mammals. Between August and November 2003, the facilitation team conducted more than 80 interviews with a variety of interested and affected parties and found that stakeholders across the various interests welcomed a new forum to discuss the issues in an open and collaborative dialogue, believing that previous efforts had not adequately addressed issues of science, management, and mitigation. Accordingly, the Commission chartered the Advisory Committee on Acoustic Impacts on Marine Mammals under the Federal Advisory Committee Act in November 2003 and began selecting Committee members in December 2003. The Commission selected 28 members from the various interested or

affected stakeholder groups to create a broad and balanced membership.

The Advisory Committee's stated objectives are to (1) review and evaluate available information on the impact of human-generated sound on marine mammals, marine mammal populations, and other components of the marine environment; (2) identify areas of general scientific agreement and areas of uncertainty or disagreement related to such impact; (3) identify research needs and make recommendations concerning priorities for research in critical areas to resolve uncertainties or disagreements; and (4) 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 Committee met on 3–5 February 2004 in Bethesda, Maryland; 28–30 April in Arlington, Virginia; 27–29 July in San Francisco, California; and 29 November–2 December in New Orleans, Louisiana. At those meetings, members of the Committee and invited experts presented information related to the identification and reduction of acoustic threats to marine mammals.

During the year, the Committee formed two subcommittees and three working groups to inform discussion by the Advisory Committee. The Synthesis of Current Knowledge Subcommittee was directed to address the Advisory Committee's first two objectives. It has been reviewing and evaluating available information on the impact of human-generated sound on marine mammals, marine mammal populations, and other components of the marine environment, and identifying areas of general scientific agreement and areas of uncertainty or disagreement related to such impacts. At the end of 2004 the subcommittee had not yet completed its report to the Advisory Committee.

The Management and Mitigation Subcommittee was set up to assist the Advisory Committee in pursuing its third and fourth objectives. This subcommittee has been examining the components of available management systems and mitigation methods currently in use, including information about their effectiveness in specific situations as well as potential options for use in the future. The subcommittee reported its progress to the Advisory Committee at the third and fourth plenary meetings but had not yet finished its report to the Advisory Committee at the end of 2004.

The three working groups were established to examine and discuss various issues related to con-

tinuing research on anthropogenic sound and its potential impact on marine mammals. The Working Group on Integrity and Balance in Research proposed some principles to guide research programs after reviewing existing standards and guidelines of professional organizations related to bias or perceived bias, and current or potential mechanisms for promoting diversity of funding sources and independence of researchers from funding sources. The Working Group on Research Permitting and Incidental Harassment Authorizations developed recommendations regarding potential improvements to the permitting processes for marine mammal research permits and authorizations. The Working Group on Animal Welfare Ethics began to develop recommendations regarding directed research on marine mammals, including controlled exposure experiments and auditory brainstem response tests, for consideration by the Committee. The working groups reported their progress to the full Committee at the fourth plenary and are expected to complete their work early in 2005.

Two more plenary meetings are tentatively scheduled for April and September 2005. The Committee expects to submit its report to the Commission in the fall of 2005, at which time the Commission will prepare a report to Congress.

### **Marine Mammal Commission International Workshop: Policy on Sound and Marine Mammals**

The 2003 Congressional mandate described above directed that the Commission's efforts to address acoustic impacts on marine mammals be international in scope. In response, the Commission decided to investigate how the issue is, or is not, being addressed beyond the United States. The Advisory Committee supported the idea of a Commission-sponsored international policy workshop and provided valuable advice in the early planning stages. In March 2004 the Marine Mammal Commission and the U.K. Joint Nature Conservation Committee (JNCC) agreed to jointly sponsor an international policy workshop on sound and marine mammals and to collaborate in drafting the agenda, identifying participants, convening the workshop, and producing a workshop report. They hoped in the process to build relationships that would improve international communication and cooperation on sound-related matters. More than 100 participants from more than 20 countries attended the workshop, held 28–30 September 2004 in London, U.K.

The workshop's goals were to (1) determine the range of existing efforts to manage, mitigate, and prevent impacts of human-generated sound on marine mammals outside the United States; (2) determine the extent to which legal and regulatory frameworks, other than those provided by U.S. domestic laws and regulations, address acoustic impacts on marine mammals; (3) identify cross-boundary or multilateral issues regarding the management and mitigation of acoustic impacts on marine mammals; and (4) identify innovative management strategies and policies that might be incorporated within national and international frameworks. Given that the intent was not to develop recommendations or reach consensus on issues, the focus was on establishing dialogue across international boundaries and on widening the perspectives and strengthening the knowledge base of workshop participants. The workshop conveners and participants made an effort to share information and improve understanding of the range of views on the various topics discussed. The Commission and the JNCC expect to release a report of the workshop proceedings in the spring of 2005.

### **Underwater Noise in Shallow-Water Environments**

This chapter deals almost exclusively with the vulnerability of offshore marine mammals to intermittent, loud sounds introduced into the marine environment by human activities. Based on this focus, one might infer that coastal or nearshore marine mammals are not vulnerable to anthropogenic sources of sound. This is not the case. Consider the inshore waters of Florida, where nearly one million recreational boats are registered and that number is boosted seasonally by an influx from out of state. Add to that commercial and naval vessels, fish-finding sonar, low-flying aircraft, bridge traffic, dredge and fill operations, and coastal construction, and it becomes clear that nearshore marine mammals may be vulnerable to a nearly constant drum of anthropogenic noise. Such noise may mask marine mammal communications, limit their ability to find food and cause increased physiological stress, cause animals to abandon habitat, or have other serious effects. Other heavily populated and trafficked coastal areas of the world provide similar exposures and issues for pinnipeds, sea otters, sirenians, and a variety of cetacean species.

Noise and disturbance associated with watercraft have been shown to alter respiration patterns and

distribution of nearshore animals such as manatees and bottlenose dolphins. Manatees in quiet waters may respond to boats more than 0.5 km away. Simple behavioral changes may not indicate significant problems for the affected species. At the same time, lack of scientific information on health effects from constant noise does not mean that no such effects occur. In the face of insufficient science and demonstrated noise effects on human health and behavior, marine mammals, with their dependence on sound, are likely to be affected in coastal regions by multiple, chronic types of noise. Studies to assess the effects of such noise on the health, behavior, and distribution of marine mammals and their prey are increasingly important as human populations and activities increase along the world's coasts.

### **Ecological Impacts of Killer Whales in the North Pacific Ocean**

A number of pinniped 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 distinct population segment of northern sea otters (*Enhydra lutris kenyoni*) is being considered for listing as threatened, and the Pribilof Islands population of northern fur seals (*Callorhinus ursinus*) has been designated as depleted. These changes in legal status have potentially significant management implications and have received considerable attention due to constraints, or the possibility of constraints, imposed on fishing and other human activities. At least three different factors have been identified as potentially important causes of the declines: oceanographic regime shifts, commercial fishing, and predation by killer whales (*Orcinus orca*). The role of each of these factors has been highly controversial. The killer whale hypothesis has been expanded to include the supposition that large-scale commercial whaling in the North Pacific Ocean and Bering Sea in the 1950s to 1970s substantially reduced the availability of prey for killer whales, causing them to shift their foraging from large cetaceans to pinnipeds and sea otters.

In its fiscal year 2004 appropriations bill, Congress 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.” To investigate the potential effects of killer whale predation on marine mammals, the Commission convened an organizing committee composed of members of the Commission and its Committee of Scientific Advisors as well as other scientists with expertise in killer whale biology and ecology. The organizing committee met several times during 2004 to develop a plan for responding to the congressional directive to evaluate the ecological role of killer whales and their possible effects on endangered marine mammal populations. The Commission also contracted with Systems Research and Applications Corporation (SRA International) to assist with project management, meeting coordination and facilitation, and compilation of final results into a report to Congress.

The plan developed by the organizing committee has three major objectives: (1) to assemble and review the available information on the role of killer whale predation in limiting populations of the most endangered marine mammals, (2) to identify important gaps in our understanding of the ecological role of killer whales and develop a research plan to address them, and (3) to report back to Congress regarding the ecological role of killer whales and provide recommendations for future research. The Commission also expects to fund essential scientific studies identified in the research plan and not supported by other funding sources.

The project will use all existing information on the ecological role of killer whales worldwide and apply that information specifically to killer whales in the North Pacific Ocean where their role in the decline of some depleted, endangered, and candidate species has been particularly controversial. Key areas of information will include such things as killer whale ecotype and stock structure; abundance and trends; broad- and fine-scale distribution, foraging patterns, nutritional needs and energetics; and pertinent information on potential prey. The project will involve key researchers that have conducted studies of killer whales in the North Pacific, killer whale experts from other regions, ecologists with expertise on predator-prey interactions or marine mammal predation in general, and administrators and managers.

The project will involve two workshops to be held in 2005. The workshops will provide a comprehensive assessment of existing knowledge about the

ecological role of killer whales, including uncertainties in that knowledge, and provide guidance regarding the scientific research needed to reduce the uncertainty in key areas. The Commission expects to submit the final report summarizing the workshop findings and other relevant information to Congress early in 2006.

### **Assessment of the Status of Endangered Marine Mammals in U.S. Waters and the Cost-Effectiveness of Related Protection Programs**

As part of the fiscal year 2004 appropriations bill, Congress directed the Marine Mammal Commission to “review the biological viability of the most endangered marine mammals and make recommendations regarding the cost effectiveness of current protection programs.”

During 2004 the Commission undertook several efforts to plan a responsive assessment of the status of endangered marine mammals. First, in consultation with congressional staff, the Commission narrowed the focus to the most endangered species in U.S. waters. Accordingly, the Commission will review information for the marine mammal species and populations currently listed as endangered or threatened under the Endangered Species Act as well as those designated as depleted under the Marine Mammal Protection Act and that occur substantially in U.S. waters (Table 3). Second, the Commission will address the directive through a combination of workshops and background reports. To help arrange those meetings and reports, the Commission contracted with SRA International. Third, the Commission formed an organizing committee to guide project activities. The committee, which first met late in 2004, includes members of the Commission’s Committee of Scientific Advisors on Marine Mammals; independent experts in the fields of population viability modeling, resource management, and natural resource economics; and representatives of the National Marine Fisheries Service and the Fish and Wildlife Service.

Based on the organizing committee’s deliberations, the Commission developed a three-phase approach to (1) summarize information on the status of the 19 listed species and related protection programs,

(2) conduct more detailed reviews including assessments of the cost-effectiveness of selected protection programs for those species deemed to be among the most endangered, and (3) prepare a summary report with recommendations to Congress. At the end of 2004 the Commission was developing plans for Phase I, which will include four parts. One part will involve a workshop, to be held in the fall of 2005, at which experts in population viability modeling and marine mammal management will review work done to date to conduct statistical assessments of the viability of the 19 listed marine mammals and determine whether and how evolving population modeling could be used to improve decision-making processes for managing endangered marine mammals.

The other three parts of Phase I will include the preparation of reports to help workshop participants in their deliberations and assist the Commission in selecting and organizing more detailed species-specific reviews during Phase II. One of the reports will examine criteria and methods for listing marine mammals under the two U.S. laws and IUCN–The World Conservation Union’s list of species at risk in its Red Book. This report will include an overview of the best available data on the current biological status of each listed species and population. Another report will summarize information on the status of protection programs for the 19 listed species and populations, including the history of efforts to develop conservation or recovery plans for the various species, the agencies involved in those programs, efforts to assess the biological effectiveness of protection programs, and the costs of those programs. The final report will evaluate protection program costs to management agencies and affected user groups.

Based on results of these efforts, the organizing committee will select protection programs for a few species for detailed examination during Phase II. Those reviews will focus on research and management issues raised in Phase I and will examine both the biological effectiveness and cost-effectiveness of key management actions that make up that species’ protection program. As of the end of 2004 the species and populations to be examined in Phase II were undetermined. Once results of Phases I and II are available, the Commission, in consultation with the project organizing committee, will prepare a final report with recommendations to Congress as Phase III of the assessment.

## Future Directions in Marine Mammal Research

In August 2003 the Marine Mammal Commission consulted many of the world's leading marine mammal scientists to identify future directions for marine mammal research. The purposes were to (1) identify and evaluate threats to marine mammals, (2) develop research recommendations to further our understanding of such threats and devise methods to address and mitigate them, and (3) generate new, creative, and proactive approaches for resolving issues related to the conservation of marine mammals and their environment. The Commission asked participants in the consultation to bear in mind the effects of human population growth and associated economic development and the importance of subsistence and cultural uses of marine mammals. They also were asked to bear in mind the values attributed to marine mammals in addition to resource utilization and the need for an interdisciplinary approach to research.

The consultation steering committee identified 10 issues or threats to marine mammals and their habitat. Leading scientists prepared background papers for each topic. At the meeting, the authors presented their papers and led discussions on them. The issues or threats identified were as follows:

- direct fisheries interactions
- indirect fisheries interactions
- disease
- contaminants
- harmful algal blooms
- anthropogenic sound
- habitat transformation
- long-term environmental change
- identification of conservation units
- human population growth and demography

Two additional topics, burgeoning marine mammal populations and ship strikes, were also discussed at the meeting.

In 2004 the Marine Mammal Commission completed a report to Congress entitled "Future Directions in Marine Mammal Research." A full report of the workshop was also completed. Both are available electronically on the Commission's Web site (<http://www.mmc.gov>) or in hard copy by contacting the Commission. In addition, the Commission is working with The Johns Hopkins University Press to publish the background papers from the consultation.

## Recommended Strategies to Improve Marine Mammal Science

The purpose of the consultation was to identify research strategies that would help ensure that managers and decision makers have the information needed to make informed decisions aimed at achieving the goals of the Marine Mammal Protection Act. Although considerable progress has been made, a range of controversies in recent years indicates that further progress is needed to meet the Act's goals with regard to marine mammals and marine ecosystems.

To that end, in its report the Marine Mammal Commission recommended seven strategies to improve marine mammal science based on the consultation. Those strategies are as follows:

(1) *Develop long-term, multidisciplinary programs suitably scaled to ecosystem complexity.* Understanding the complex dynamics of multifaceted, variable marine ecosystems and accounting for diverse human effects will require multidisciplinary research (e.g., oceanography, marine mammal and fishery biology, invertebrate biology, physiology, ecology, and various social sciences). Research must be tailored to match the temporal and spatial scale of complex ecosystem dynamics. It will require better communication and coordination among previously isolated disciplines, expansion of existing monitoring programs, and new programs where none currently exist. Well-managed marine protected areas are needed as controls for distinguishing between natural phenomena and anthropogenic effects. A comprehensive national strategy is needed to set research priorities, measure progress, and secure adequate research support.

(2) *Ensure that population and ecosystem assessment programs are sufficient to inform management decisions regarding current and future threats.* Existing assessment efforts are, in many cases, not sufficient to describe the status, trends, and ecology of marine mammal populations, the effects of human activities on them, and the status of the ecosystems of which they are a part. Basic information on topics such as abundance, distribution, mortality, reproduction, and health is lacking for most populations, including some that are at great potential risk from human impact. More rigorous assessment programs are needed for marine mammals. They must be appropriately scaled temporally and spatially, and they must involve multidisciplinary approaches that relate

marine mammal status and trends to natural and human-altered ecosystem dynamics.

(3) *Develop and validate specific, measurable, and robust management standards to achieve the conservation goals of the Marine Mammal Protection Act and related legislation.* The existing management standards set to achieve the goals of the Marine Mammal Protection Act and related legislation (e.g., the Endangered Species Act) often lead to controversy because they (1) lack sufficient specificity, (2) cannot be reliably measured for natural populations, or (3) vary as a function of human activities and therefore do not provide stable or suitable references for assessing the effects of those activities. “Optimum sustainable population,” an important standard in the Marine Mammal Protection Act, has been estimated for only a few marine mammal populations. Scientists and managers generally assume the optimum sustainable population to be a fraction of the environmental carrying capacity, but carrying capacity is often unknown for marine mammal populations and, in some cases, may have been artificially reduced by human activities. The Endangered Species Act standards of “jeopardy” and “adverse modification” are similarly vague and controversial. More specific, measurable, and robust standards must be developed and validated to guide management and ensure that conservation goals are met.

(4) *Identify marine mammal conservation units essential to ecosystem health and function.* Marine mammal species often exist as multiple population, stock, or demographic units with limited interaction among them. These units can vary in distribution, status, trends, vital rates (survival and reproduction), life history characteristics, and genetics. Although subtle, such variation implies different ecological and evolutionary roles for these units. The identification and conservation of such units is essential to maintain the natural function of healthy ecosystems.

(5) *Increase international cooperation in studying and addressing human-related threats.* Many threats to marine mammals and marine ecosystems result from the activities of more than one nation. Hence, marine mammals and threats to them are most effectively studied and managed through international cooperation. Cooperative arrangements are needed to address such multinational issues and may range from informal sharing of information on transboundary stocks to highly structured agreements to study and manage resources in international waters (e.g.,

the Convention for the Conservation of Antarctic Marine Living Resources). Cooperation increases both the knowledge base pertaining to threats to marine mammals and marine ecosystems and the resources available to study and manage those threats.

(6) *Properly assess and communicate the strengths and limitations of the scientific process, including measures of uncertainty that are an essential element of high-quality science.* Management decisions made under the Marine Mammal Protection Act and related legislation are to be based upon the “best available science.” Due to the difficulty of studying marine ecosystems, that science may be associated with large uncertainty. Accounting for such uncertainty is an essential element of risk analysis and informed decision making. To reliably guide decision makers, the best available scientific information must include appropriate descriptions of uncertainty (i.e., how good is the information?). Such descriptions are needed to judge whether scientists will be able to detect significant human-related effects when they occur and to assess the likelihood that incorrect conclusions could result in either unnecessary regulation of human activities or excessive environmental impacts.

(7) *Address ultimate as well as proximate causes of environmental problems.* Research on the factors affecting marine mammals and marine ecosystems often focuses on proximate rather than ultimate causes. Yet, virtually all of the threats discussed at the consultation are ultimately related to the size, growth rate, consumption patterns, and behavior of Earth’s human population. In the foreseeable future, the human species is projected to increase in number and expand its consumption of resources. Maintaining the health and stability of marine ecosystems will require focused long-term research on our own expanding populations, shifts in distribution, and patterns of consumption (i.e., our ecological footprints). Such research is needed to elucidate our impact and provide guidance on how to limit and compensate for it. It should be linked to long-term assessments of marine biodiversity, ecosystem resilience, the loss of marine habitats through development and contamination, consumption of renewable and nonrenewable resources, and human activity in the marine environment.

### **Risks of Inadequate Research and Management**

At the consultation in 2003, the Commission asked participants to predict the consequences of not

pursuing a more integrated, holistic, and anticipatory marine mammal research agenda. They identified the following consequences:

- The goals of the Marine Mammal Protection Act, the Endangered Species Act, and other environmental legislation will likely not be met, and marine ecosystems will continue to deteriorate.
- Some marine mammal populations will persist, perhaps in large numbers, but many of those that are currently endangered will decline to extinction, as has already occurred for the Steller sea cow, North Atlantic gray whale, Caribbean monk seal, and Japanese sea lion.
- Management and recovery efforts will remain reactive rather than proactive and will be confounded by uncertainty and controversy.
- Controversies will be fueled by our inability to distinguish anthropogenic effects from natural phenomena.
- In the absence of clear, unambiguous evidence of human impact, economic demands will force governments and management agencies to compromise conservation objectives, and this will lead to further losses of biodiversity and ecological integrity.
- Remedies will continue to focus on proximate rather than ultimate causes, and short-term conservation successes will be offset by long-term conservation failures.
- Long-term degradation of marine ecosystems will pose increasing limits on socioeconomic alternatives, as has already been witnessed in many overfished ecosystems.
- Alaska Natives and other indigenous people will have to drastically modify, if not abandon, subsistence aspects of their cultures.
- The natural character of marine ecosystems will remain unknown and eventually become unknowable.
- Ultimately, we will pass on to our children a world diminished in its diversity, its options, and its biological wonder.

## **Implementation of the Recommended Strategies**

Implementation is essential to resolve the threats to marine mammals and marine ecosystems, to avoid the adverse future consequences anticipated by the consultation participants, and to achieve the goal of maintaining healthy, stable marine ecosystems without imposing unnecessary constraints on human activities.

Implementation will require an investment beyond current levels of support for research and assessment. However, like preventive medicine, it will prove to be cost-effective over time. Currently much of the burden for carrying out such work falls on offices and divisions within the National Marine Fisheries Service and the Fish and Wildlife Service. Their budgets have been and are currently insufficient for implementing the strategies recommended in the report. The cost of implementing the recommendations should be borne by those who stand to benefit financially from activities that pose threats to marine mammals and marine ecosystems.

Finally, science alone does not and cannot resolve the threats that were the focus of the Marine Mammal Commission's consultation. Solutions must reflect societal values, whether cultural, economic, aesthetic, or conservation-oriented. Science provides both knowledge that can shape those values and tools for estimating the costs and benefits of particular courses of action. Proactive science, in particular, can inform the public and decision makers of the effects of certain actions before social, economic, and environmental crises arise. The Marine Mammal Commission is prepared to assist in the implementation of these recommendations in hopes that efforts to foster thoughtful, carefully directed, proactive science will be useful in preventing such crises, shaping our nation's values, and maintaining the health and stability of marine ecosystems.

## Chapter V

# INTERNATIONAL ASPECTS OF MARINE MAMMAL PROTECTION AND CONSERVATION

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 the international arrangement for protecting and conserving marine mammals.

During 2004 the Commission continued to advise the U.S. delegations to the International Whaling Commission and the Conference of the Parties under the Convention on International Trade in Endangered Species of Wild Fauna and Flora. An issue of major concern that arose during the year concerned the planned offshore oil and gas exploration off the Sakhalin Islands in the North Pacific Ocean and the possible effects on the critically endangered western population of Pacific gray whales (*Eschrichtius robustus*). The Commission's Scientific Program Director and a member of the Committee of Scientific Advisors were asked to participate in a scientific review of the issue being conducted by IUCN–The World Conservation Union at the request of the lending institutions. In addition, the Commission paid close attention to developments in the eastern tropical Pacific tuna fishery and its possible impact on dolphin stocks in that area. These activities are discussed in the following sections.

### International Whaling Commission

The International Whaling Commission (IWC) is the implementing body of the International Con-

vention for the Regulation of Whaling of 1946. The Convention's primary objective is the proper conservation of world whale stocks, thus making possible the orderly development of the whaling industry. The Convention established the IWC to provide for a continuing review of the condition of whale stocks and for such additions to or modifications of the agreed conservation measures as might be desirable. At the end of 2004, 59 nations were members of the IWC.

The IWC's 56th annual meeting was held 19–22 July 2004 in Sorrento, Italy. The U.S. Commissioner to the IWC served as acting chairman for the meeting due to the absence of the elected chairman and the vacancy of the vice chair position. The Commissioner from Japan served as acting vice chairman.

The philosophical divide between pro-commercial whaling countries and pro-conservation countries within the Commission continues to grow. In recent years Japan and other pro-whaling members have recruited several nations to join the IWC and the pro-commercial whaling camp. The United States and other members of the pro-conservation group have responded with their own recruitment efforts. Neither of the two major camps within the IWC commands sufficient numbers to reach the three-quarters majority required to amend the schedule.

### Scientific Committee

The IWC Scientific Committee conducted in-depth assessments of several whale species or stocks in 2004. These included the Bering-Chukchi-Beaufort Seas stock of bowhead whales (*Balaena mysticetus*), the western North Pacific common minke whales (*Balaenoptera acutorostrata*) (with a focus on J stock), the Southern Hemisphere stock of humpback whales (*Megaptera novaeangliae*), and sperm whales (*Physeter macrocephalus*).

The committee endorsed the concept of a series of regional workshops to develop short- and long-term approaches to the successful management and mitigation of cetacean bycatch problems on a region-by-region basis. The committee reviewed the status of the franciscana (*Pontoporia blainvillei*), which is found in the coastal waters of southern Brazil, Uruguay, and northern Argentina. There is growing concern regarding the sustainability of the bycatch of these dolphins. The committee concluded that at least three genetically distinguishable populations of this species exist.

The committee also conducted a mini-symposium on noise, with the goal to assist in the development and interpretation of studies aimed at understanding the potential impact of anthropogenic noise on cetaceans. A more detailed discussion of this symposium is found in Chapter IV.

### **Cetacean Habitat**

The IWC held a workshop on degradation of cetacean habitat on 12–15 November 2004 in Siena, Italy. Sponsors were the Government of Austria, the Environmental Investigation Agency, ASMS-Ocean Care, and the World Wide Fund for Nature. The workshop was the third of a series on habitat-related issues. Previous workshops focused on the effects of chemical pollution on cetaceans (Norway, 1995) and the effects of climate change (Hawaii, 1996). The IWC Scientific Committee has identified eight priority topics with regard to the cetacean habitat and the environment: climate/environment change; physical and biological habitat degradation; chemical pollution; direct and indirect effects of fisheries; impact of noise; disease and mortality events; ozone and UV-B radiation; and Arctic issues.

The Siena workshop began by defining habitat (i.e., an animal's abiotic [physical and chemical] and biotic environment) and habitat degradation (i.e., processes of anthropogenic origin that make habitats less suitable or less available to marine mammals). It then focused on developing a framework for assessing possible relationships between habitat degradation and individual and population-level responses in cetacean species. To that end, the workshop addressed three main topics: assessment of habitat quality and changes therein, expected responses at the individual cetacean level, and the resultant consequences for the affected cetacean population as investigated primarily through a modeling framework.

Elements for habitat assessment include the following:

- basic information on the distribution of cetacean species
- identification and characterization of the essential features of that habitat
- baseline information concerning the state of habitat and its essential features
- long-term studies to characterize how habitat changes over time, both naturally and as a result of anthropogenic influence
- clarification of the links between habitat (and changes therein) and individual and population-level responses.

With regard to possible effects of habitat degradation on individual animals, the workshop considered a range of possible response measures (e.g., changes in growth, condition, blood chemistry, physiology, contaminant levels, behavior, foraging success, habitat use patterns), all of which may ultimately affect the likelihood that those individuals will survive and reproduce. With regard to population-level effects, the workshop considered a range of possible demographic consequences of habitat degradation (e.g., changes in survival and reproductive rates, age/size/sex composition, distribution, abundance, trends, and, ultimately, population viability). Developing a framework for habitat assessment is a challenge because the information needed to characterize links between habitat condition (the independent variable) and population response (the dependent variable) does not exist for most cetacean populations. In addition, both habitat condition and the population response are, in fact, compound variables that are likely to integrate a suite of factors over different spatial and temporal scales, confounding the assessment and prediction of habitat effects on population status.

The workshop report is due out in the spring of 2005 and is expected to contain a number of recommendations regarding (1) application of the workshop framework to several well-studied marine mammal populations to test its utility; (2) a broad review of cetacean species vulnerable to habitat-related threats and identification of priorities for research and management; (3) development and evaluation of indices of habitat quality to focus and simplify the task of habitat assessment; (4) development of multidisciplinary, international (where appropriate) research protocols to facilitate assessment of habitat effects on cetacean populations; (5) establishment of proto-

cols for data sharing and storage protocols to provide a basis for comparative studies; (6) development of spatially explicit models to expand the framework; and (7) investigation into possible methods for habitat restoration where needed.

### Revised Management Scheme

Before its adoption of the moratorium on commercial whaling in 1982, excessive catch quotas authorized by the IWC contributed to the overexploitation and depletion of many whale stocks. The Scientific Committee subsequently developed a scientifically based method for determining commercial whaling catch quotas that would have a low probability of adversely affecting harvested whale stocks. Although the IWC has accepted and endorsed the Revised Management Procedure (RMP) for commercial whaling, it has noted that work on a number of issues, including mechanisms for compliance monitoring and enforcement and requirements for conducting whale surveys and data analyses must be completed as part of a Revised Management Scheme (RMS) before it will consider establishing catch limits other than zero.

After the 2003 annual meeting, the IWC chairman established a “Friends of the Chair” group to continue work on the RMS in the hopes of resolving the prolonged stalemate. This group, selected by the chairman, consisted of representatives of Denmark, Iceland, Japan, the Netherlands, Spain, Sweden, and the United States. The key issues addressed by the group included catch verification, the Compliance Review Committee, animal welfare data, the moratorium on commercial whaling for minke whales, scientific whaling, and cost sharing. A proposal to take the RMS process forward was developed during intersessional meetings and provides a framework for developing a final RMS package. Following extensive debate on the proposal, a resolution aimed at trying to have draft text ready for consideration and possible adoption and/or to identify any outstanding policy and technical issues in 2005 was passed by consensus. The first meeting of the RMS Working Group was held 29 November–1 December 2004 in Borgholm, Sweden, followed by a two-day meeting of the small drafting group.

### Conservation Committee

At the 2003 meeting the IWC established a new conservation committee. The United States favored

the creation of the committee in support of the view that the Convention recognizes the principles of both conservation and management. Pro-whaling countries, led by Japan, Norway, and Iceland, opposed the creation of the committee because they viewed it as a whale protection effort inconsistent with the Convention. Japan and other countries from the Caribbean, West Africa, and the South Pacific did not participate in the 2004 inaugural meeting, during which the conservation committee determined its terms of reference and operating principles.

### Commercial Whaling

The IWC continues to maintain the moratorium on commercial whaling that was adopted in 1982. However, because Norway lodged an objection to the moratorium, it is not bound by that decision and continues to authorize the commercial take of more than 600 minke whales from the northeastern Atlantic. At the 2004 meeting the Commission did not adopt proposals by Japan for catch limits of 100 minke whales and 150 Bryde’s whales (*Balaenoptera brydei*) to be taken by coastal community-based whaling. However, the Commission passed a resolution by consensus to work to resolve this issue.

### Aboriginal Subsistence Whaling

The moratorium on commercial whaling does not affect aboriginal subsistence whaling that the IWC has authorized for Denmark (Greenland, fin [*Balaenoptera physalus*] and minke whales), the Russian Federation (Siberia, gray whales), St. Vincent and The Grenadines (humpback whales), and the United States (Alaska, bowhead whales, and Washington, gray whales).

The Scientific Committee has continued to make progress toward developing new management regimes for aboriginal subsistence whaling. In October 2002 the IWC requested that the committee undertake by 2004 an in-depth assessment of the Bering-Chukchi-Beaufort Seas stock of bowhead whales that is hunted by Alaskan and Russian Natives. In response, the United States undertook a major genetics research effort focusing on stock structure. However, the results were inconclusive and left open the question of whether the observed genetic differences in the samples implied multiple stocks, reflected a single population undergoing generational gene shift, or were simply caused by shortcomings of the available data. The committee agreed with U.S. scientists that it was

not necessary to modify the IWC's current management regime, provided the United States undertook an expanded research program to resolve the issue.

At the 2004 meeting the IWC endorsed and adopted a new long-term scientific approach to providing advice on strike limits for gray whales, similar to the approach adopted for bowhead whales two years ago. The Scientific Committee will now work to produce a similar approach for Greenland's aboriginal subsistence whaling fisheries.

### Scientific Permits

Japan continues to conduct and expand its lethal scientific research whaling in Antarctica and the North Pacific and annually takes up to 700 whales of four species—minke, Bryde's, sei (*Balaenoptera borealis*), and sperm. At the 2004 meeting Japan announced that it would increase the number of whales taken annually in the North Pacific to 100 sei whales and 120 coastal minke whales.

Japan also reported that it will begin another multiyear research whaling program in the Antarctic upon the conclusion of its initial 16-year program this year. This means that Japan will begin another scientific whaling program without giving the Scientific Committee the opportunity to fully review the results of the initial program.

In 2003 Iceland announced and began a research whaling program. Iceland proposed to take minke, fin, and sei whales, totaling 250 whales. Iceland issued a permit for the capture of 39 minke whales, and in August 2003, 36 minke whales were killed. In June 2004 Iceland announced its intention to take 25 minke whales during the year, which it is reported to have done.

### Sanctuaries

At the 2004 IWC meeting, Australia and New Zealand again proposed to establish a new whale sanctuary in the South Pacific. Argentina and Brazil again proposed to establish a sanctuary in the South Atlantic. Both proposals failed to gain the necessary support. In addition, Japan's proposal to delete the provision for the Southern Ocean Sanctuary and to include a catch limit of 2,914 Antarctic minke whales was not adopted.

### Status of Large Whales

Despite a long period of protection, several populations of large whales remain highly endangered

and number 500 or fewer. They include all bowhead whale stocks apart from the Bering-Chukchi-Beaufort Seas stock, gray whales in the western Pacific, all stocks of northern right whales (*Eubalaena glacialis*) and some stocks of blue whales (*Balaenoptera musculus*). The IWC has attached great importance to trying to improve the survivorship of these stocks. In particular, in 2004 it adopted a resolution on the critically endangered western North Pacific gray whales. The resolution, adopted by consensus, notes concerns regarding the development of major oil and gas deposits off Sakhalin Island, where the entire population of about 100 gray whales feeds, and requests the IWC Secretariat to actively participate and provide expertise to any international expert panel convened to consider the impact on this stock. Nongovernmental organizations and the potential lenders to the project have convened a panel of scientists to examine the potential impact of the Sakhalin Energy Investment Corporation (SEIC) oil and gas development project on western gray whales. SEIC contracted with IUCN–The World Conservation Union to conduct an independent scientific review to examine western gray whale conservation issues related to the proposed development. A more detailed discussion of the IUCN review is provided in the following section.

The 57th annual meeting of the IWC will be held in June 2005 in Ulsan, Republic of Korea.

## Western Gray Whales and Oil and Gas Development off Sakhalin Island, Russia

The western population of North Pacific gray whales is listed as critically endangered by IUCN–The World Conservation Union. The population currently numbers about 100 whales, of which about 23 are reproductively mature females. Their historical abundance is poorly known but was probably at least 1,500. They were reduced by commercial whaling and thought to be extinct by the mid-1900s. A few whales were resighted in the early 1970s, and observations increased in the 1980s off the northeastern coast of Sakhalin Island in the Sea of Okhotsk (Figs. 15 and 16). The whales are now observed in these coastal waters each year from about June to November. The nearshore conditions off northeastern Sakhalin Island appear to favor gray whale prey, and the only two known feeding areas for the whale population are

located in this region. Their distribution during the remainder of the year is largely unknown although a few stranding records and sighting observations indicate that they migrate southward along the east coast of Asia to the waters off southern China or perhaps farther south. Since the mid-1990s extensive research has been conducted on the population on its Sakhalin feeding grounds. The results of that research provide important information on the population's abundance, size/sex composition, reproductive and survival rates, condition, and foraging behavior.

The coastal waters around Sakhalin Island, particularly its northeastern coast, overlies large oil and gas reserves. The Russian Federation has divided the Sakhalin shelf into nine project areas (Fig. 17). Commercial development is occurring in three project areas, with planning under way for others. Sakhalin II is the most advanced of these development projects and began commercial production in 1999. Sakhalin

II is being developed and managed by SEIC, which is a partnership of Shell, Mitsui, and Mitsubishi. SEIC is developing Sakhalin II under a production sharing agreement with the Russian Federation and the Sakhalin regional government.

Development of Sakhalin II is progressing in two phases. Phase 1 consists of an offshore drilling and production platform (PA-A), a subsea pipeline to a single-anchor leg mooring, and a large tanker used as a floating storage and off-loading facility. Oil is transferred from this facility to tankers for distribution throughout the world. Although Phase 1 has been in production since 1999, it is only able to operate during the period when waters are sufficiently ice-free, from approximately June to November.

Phase 2 of Sakhalin II is currently under development. This phase will involve the construction of two more offshore platforms (PA-B, Lun-A); removal of the subsea pipeline from the PA-A platform, the



Figure 15. Map of the Sakhalin Island region. Figure courtesy of the Independent Scientific Review Panel on the Impacts of Sakhalin II Phase 2 on Western North Pacific Gray Whales and Related Biodiversity, IUCN, Gland, Switzerland, and Cambridge, United Kingdom.

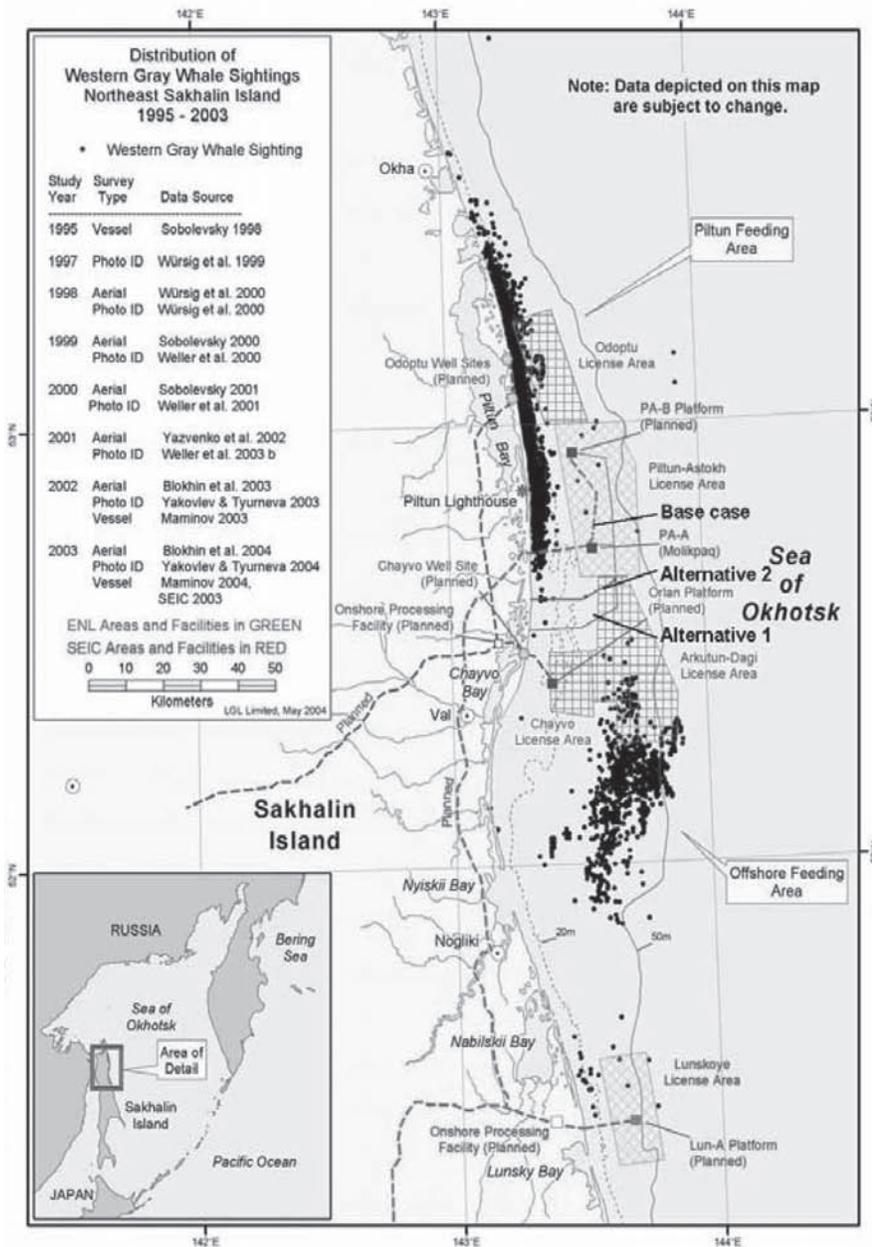


Figure 16. Distribution of sightings of western gray whales off the northeast coast of Sakhalin Island. Figure courtesy of the Independent Scientific Review Panel on the Impacts of Sakhalin II Phase 2 on Western North Pacific Gray Whales and Related Biodiversity. IUCN, Gland, Switzerland, and Cambridge, United Kingdom.

single-anchor leg mooring, and the floating storage and off-loading tanker; construction of pipelines from the three platforms to shore; an onshore pipeline to the southern end of Sakhalin Island; and construction of a liquid natural gas plant and export terminal at Prigorodnoye on Aniva Bay (See Fig. 16). Phase 2 will involve year-round production of oil and gas.

Phase 1 and 2 facilities are close to the only two known foraging areas of the western gray whale population. They pose a number of risks to the western gray whale population, both during construction and operation. An oil or gas spill could directly affect the whales or affect them indirectly by damaging or destroying the benthic communities in their feeding grounds. Construction will introduce noise into the nearshore marine environment, require considerable vessel activity with the accompanying risk of ship strikes, and may cause physical disturbance to important feeding areas or the ecological mechanisms that support them. One pipeline route under consideration would traverse the lower end of the nearshore feeding area. The Piltun Lagoon appears to play an important role in creating the nearshore feeding area used by mothers and calves, and disturbance or contamination of the lagoon could have particularly serious effects. Finally, removal of the Phase 1 tanker-based transportation system near the gray whale feeding grounds will likely reduce risks to the whales. The transportation system associated with Phase 2 will be based farther to the south, away from the feeding grounds. The tankers loaded from the new facility at Prigorodnoye will, however, still pose some risk

because the traffic lanes used by many of the tankers will cross the whales' migratory route.

The risks associated with Sakhalin II construction and operations are not the only threats to the western gray whale population. Additional risks are, or will be, posed by other oil and gas development in the region (Sakhalin I and V are currently in the early

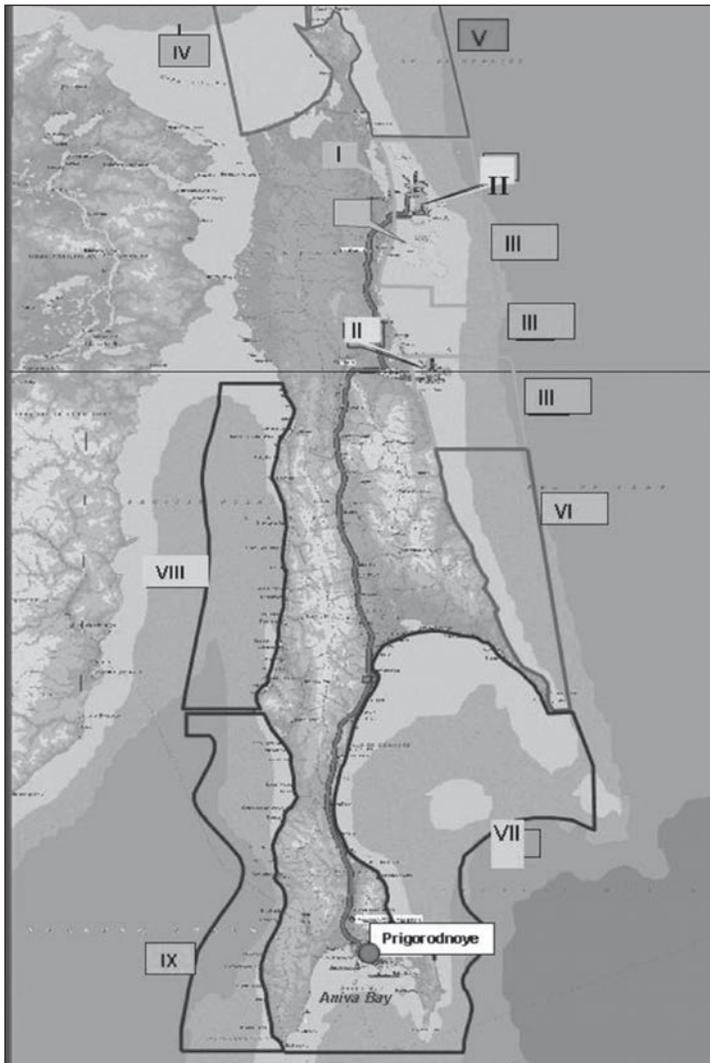


Figure 17. Map of the Sakhalin region showing the nine project areas. Figure courtesy of the Independent Scientific Review Panel on the Impacts of Sakhalin II Phase 2 on Western North Pacific Gray Whales and Related Biodiversity. IUCN, Gland, Switzerland, and Cambridge, United Kingdom.

stage of development and other projects are being planned), as well as regional activities unrelated to oil and gas production and various other threats to the population throughout its range (e.g., directed killing, bycatch in fisheries, ship strikes, noise, contaminants, disease, predation). Ultimately, the persistence and recovery of the western gray whale will depend on whether it can survive the cumulative effects of all the risk factors.

The underlying question with regard to Sakhalin II Phase 2, then, is whether all the different facets of development and operation are being and will be

conducted in a manner that allows oil and gas production without jeopardizing the survival and recovery of the western gray whale population. Although SEIC has committed extensive resources to address this question, it was raised again by international banks that SEIC asked to provide loans to get Phase 2 into production. The lenders contacted a number of organizations, including the Marine Mammal Commission, to discuss the possibility of a review of Sakhalin II Phase 2 construction and operations to provide the information needed to assess the level of risk to western gray whales and their habitat. After several months of discussion among the lenders, SEIC, conservation organizations, and marine mammal biologists, SEIC asked IUCN–The World Conservation Union to organize and conduct such a review. The IUCN agreed, appointed the chairman of its cetacean specialist group as the chairman for the review, and, with the chair, appointed an independent scientific review panel to conduct the review. The panel and its terms of reference are described in detail on the IUCN Web site (<http://www.iucn.org/themes/business/isrp/index.htm>). The panel met 6–8 September 2004 in Toronto, Canada; 2–7 October 2004 in Yuzhno, Sakhalin Island, Russian Federation; and 6–8 November 2004 in Sausalito, California. It was expected to meet again in Seattle, Washington, at the end of January 2005 and to turn over its final report to the IUCN by mid-February 2005.

## 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 km<sup>2</sup> (5 million mi<sup>2</sup>), stretching from southern California to Chile and westward to Hawaii. Late in the 1950s U.S. fishermen began to exploit this association by deploying large purse seine nets around dolphin schools to catch the tuna swimming below. Despite efforts by fishermen to release the dolphins unharmed, some animals become trapped in the nets and are killed or injured. Estimated dolphin

mortality in the early years of the fishery was in the hundreds of thousands per year. Efforts to reduce the incidental mortality of dolphins in this fishery have been a primary focus of the Marine Mammal Protection Act since it was enacted in 1972. As a result of these efforts, direct incidental mortality averages less than 2,000 dolphins per year. Nevertheless, at least two dolphin stocks that had been heavily impacted 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 mortality, and the stocks remain severely depleted. More recently, efforts have focused on identifying the possible 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, programs to conserve the marine mammal stocks impacted by the fishery have taken on an increasingly international focus. Those 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 2004 only 12 U.S. vessels obtained permits to fish for tuna in the eastern tropical Pacific, and none of those vessels intentionally set on schools of dolphins. In fact, no U.S. vessel has intentionally set on dolphins since 1994. Nevertheless, some accidental marine mammal mortalities may occur when purse seine nets are deployed on schools of tuna that are not associated with large schools of dolphins. For example, 24 dolphins were accidentally captured and killed by U.S. vessels in 1998. The most recent mortalities 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 cubic meters in well volume—roughly 400 short tons/363 metric tons or more in capacity) in the foreign fleet. By 1990 this number had climbed to about 100. In 2003, the latest year for which complete data are available, 148 large purse seine vessels flagged in foreign countries participated in the fishery. The largest fleets belong to Mexico and Ecuador with 38 and 39 vessels, respectively. Other major participants in the fishery are Venezuela, with 25 large purse seine vessels, and Panama, with 13. Preliminary information for 2004 indicates further growth of the tuna fishing fleet in the eastern tropical Pacific, with about 155 large purse seine vessels participating.

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, the replacement vessel cannot exceed the capacity of the vessel or 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 IATTC 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. However, 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 make a single fishing trip of not more than 90 days in the eastern tropical Pacific without counting against the fleet capacity limit.

Not only has overall fleet capacity increased in recent years, but there has been an increasing trend in the number of sets being made on schools of dolphins. Data on the number of sets on dolphins made

during the past 25 years are presented in Figure 18. The Inter-American Tropical Tuna Commission reports that 13,839 sets on dolphins were made in 2003, the highest number in any year since the fishery began. Preliminary data for 2004 indicate that 11,788 dolphin sets were made in 2004. Despite the increase in the number of dolphin sets being made in recent years, reported dolphin mortality has not changed appreciably during this period. As reflected in Table 8, 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. Although subject to revision, the Inter-American Tropical Tuna Commission preliminarily estimates that 1,469 dolphins were killed incidental to purse seine fishing operations in the eastern tropical Pacific in 2004. Although this level of mortality is believed not to be biologically significant to the affected dolphin stocks, as discussed in greater detail later in this section, 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, recent increases in the number of dolphin sets being made 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. There is a growing body of evidence that some vessels of less than this size have been setting on dolphins. According to the Inter-American Tropical Tuna Commission, 300 sets on dolphins have been made by vessels

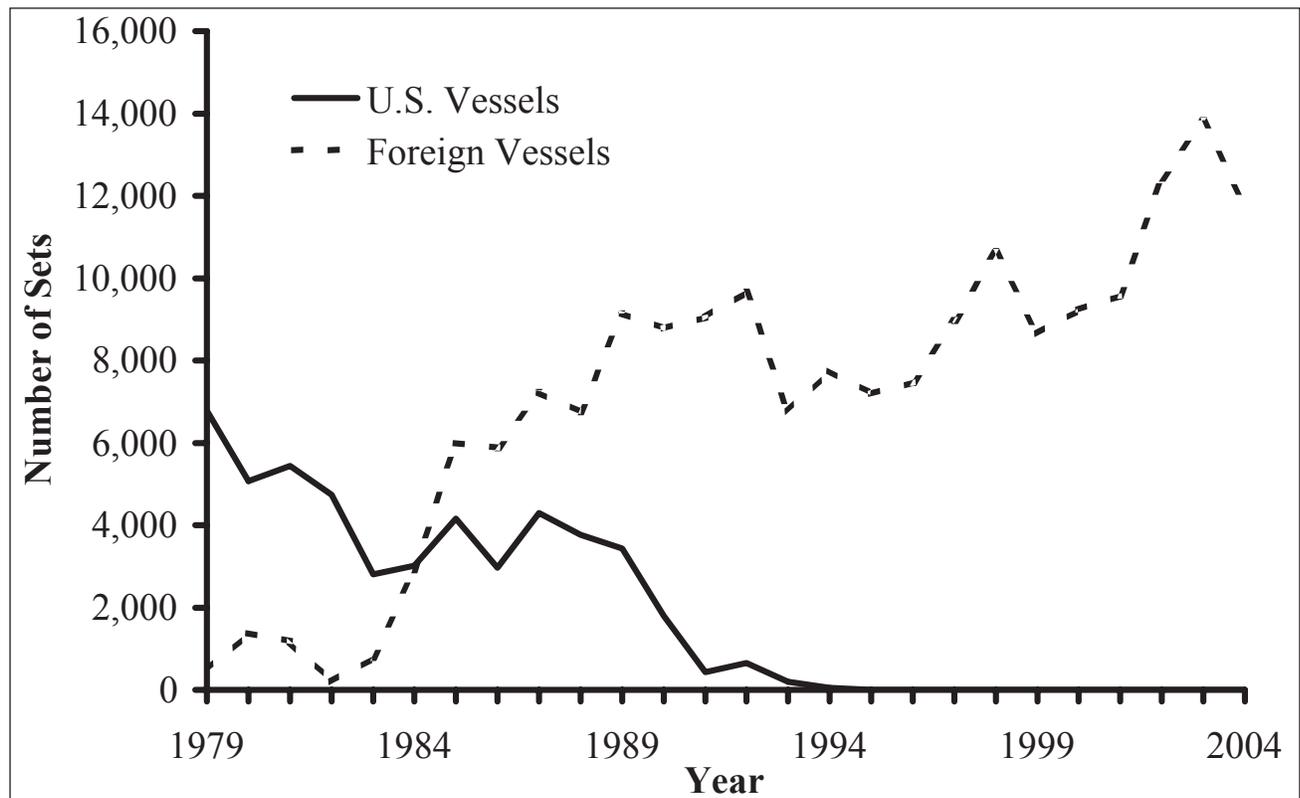


Figure 18. Number of U.S. and foreign vessel sets on dolphins, 1979–2004. Data provided by the Inter-American Tropical Tuna Commission and the National Marine Fisheries Service.

**Table 8. Estimated incidental kill<sup>1</sup> of dolphins in the tuna purse seine fishery in the eastern tropical Pacific Ocean, 1972–2004**

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 <sup>2</sup>

<sup>1</sup> 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.

<sup>2</sup> Preliminary estimate.

smaller than 400 short tons since 1987. In response, 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 Consolidated Appropriations Act enacted in 2004 (Pub. L. 108-447) provides \$2 million for National Marine Fisheries Service activities related to dolphin encirclement for fiscal year 2005. The legislation directed that the Service dedicate some of that 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 International Dolphin Conservation Program

Representatives of the United States and 11 other nations signed the Declaration of Panama on 4 October 1995. By doing so, these nations declared their intention, contingent on the enactment of changes in U.S. law, to formalize an earlier agreement (the La Jolla Agreement), under which significant reduction in dolphin mortality had occurred, as a binding international agreement and to incorporate additional dolphin protection measures. The envisioned changes to U.S. law included allowing access to the U.S. market for all tuna, whether caught by setting on dolphins or not, provided that it was caught in compliance with the agreement. The Declaration of Panama also called on the United States to redefine the term “dolphin-safe” to include any tuna caught in the eastern tropical Pacific by a purse seine vessel in a set in which no dolphin mortality was observed, rather than applying that term only to tuna caught on trips during which no sets on dolphins were made. Among other things, the new international agreement was to establish annual stock-specific quotas on dolphin mortality based on minimum population estimates and to limit overall mortality to no more than 5,000 animals a year. The international agreement envisioned by the parties to the Declaration of Panama, the Agreement on the International Dolphin Conservation Program, was concluded in May 1998 and entered into force on 15 February 1999.

Under the Agreement on the International Dolphin Conservation Program, each vessel of greater

than 400 short tons of carrying capacity is required to carry an observer on each fishing trip made in the eastern tropical Pacific Ocean. At least 50 percent of the observers placed on a nation's vessels are to be from the Inter-American Tropical Tuna Commission's observer program, with the remainder coming from a parallel national program, should the nation decide to establish one. Among other things, the observers are to report the number of dolphins killed and seriously injured in purse seine sets.

### **The International Dolphin Conservation Program Act**

Efforts to amend U.S. law as called for by the Declaration of Panama culminated in enactment of the International Dolphin Conservation Program Act on 15 August 1997. The new law made several changes to the U.S. tuna-dolphin program. Among other things, changes to section 304 of the Marine Mammal Protection Act directed the Secretary of Commerce, in consultation with the Marine Mammal Commission and the Inter-American Tropical Tuna Commission, to conduct a study of the effects of chase and encirclement on dolphins and dolphin stocks taken in the course of purse seine fishing for yellowfin tuna in the eastern tropical Pacific. The study was to consist of abundance surveys and stress studies designed to determine whether chase and encirclement are having a "significant adverse impact on any depleted dolphin stock in the eastern tropical Pacific Ocean." Specifically, the amendments required the National Marine Fisheries Service to survey the abundance of depleted dolphin stocks during 1998, 1999, and 2000. The stress studies were to include (1) a review of relevant stress-related research and a three-year series of necropsy samples from dolphins killed in dolphin sets, (2) a one-year review of relevant historical demographic and biological data related to dolphins and dolphin stocks, and (3) an experiment involving the repeated chasing and capturing of dolphins by means of intentional encirclement. The amendments directed the Service to make a final finding on the effects of chase and encirclement by 31 December 2002. If the Service determined that there is no significant adverse effect, the definition of dolphin-safe tuna was to change to include all tuna harvested in sets in which no dolphin mortality or serious injury was observed.

The National Marine Fisheries Service issued the final finding required under the International Dolphin Conservation Program Act on 31 December

2002. The Service found that "[b]ased on the information reviewed, . . . the intentional deployment on or encirclement of dolphin[s] with purse seine nets is not having a significant adverse effect on any depleted dolphin stock in the [eastern tropical Pacific]." The Service published that finding in the *Federal Register* on 15 January 2003, providing additional details on the information reviewed, the process followed, and the criteria used to make that decision. The finding and supporting documentation are found on the Service's Web site (<http://swr.nmfs.noaa.gov/tmm.htm>).

### **Litigation**

Within hours of the release of the final finding, environmental organizations filed suit in the U.S. District Court for the Northern District of California challenging the finding, claiming that it was not supported by the research findings and other information and, therefore, that it was arbitrary and not in accordance with the applicable law. As discussed in the previous annual report, the court issued a preliminary injunction in the case, *Earth Island Institute v. Evans*, on 10 April 2003, enjoining the Service from taking any action under the International Dolphin Conservation Program Act to allow any product to be labeled as dolphin-safe that was harvested using purse seine nets intentionally set on dolphins in the eastern tropical Pacific.

The court issued its ruling on the full merits of the case on 9 August 2004. As was the case with earlier litigation concerning an initial finding on the effects of chase and encirclement made by the Service in 1999, the court found that the agency had failed to diligently pursue the necropsy study and the chase and capture experiment mandated by the International Dolphin Conservation Program Act. The court believed that so little had been accomplished on those projects that the results were rendered meaningless.

With respect to the necropsy study, the Service had determined that the minimum number of samples needed to allow for "scientifically valid extrapolation" to the two depleted dolphin populations being assessed was 300 per stock, for a total of 600 necropsies. However, at the time the final finding was made, only 56 dolphin necropsies had been completed, or less than 10 percent of the minimum number needed to provide meaningful results. The court ruled that excusing the agency from obtaining a sufficient sample size to achieve scientifically meaningful results would be "tantamount to excusing [it] from the Congressio-

nal mandate” with which it was charged. The court remained unswayed by the Service’s arguments that the logistical and bureaucratic challenges of working with other nations to secure samples justified the slow progress, concluding that the record demonstrated a lack of due diligence on the agency’s part. As for the chase and encirclement experiment, the court also concluded that the sample sizes obtained were too small to address important questions related to the finding or to allow for population-level inferences. In the court’s opinion, the record of agency action demonstrated “a pattern of delay and inattention that contributed to limited results.”

Under the International Dolphin Conservation Program Act, the final finding was to be based on the “best available scientific evidence.” The Service had established a process that focused on four general issues for assessing that information with respect to the apparent failure of depleted dolphin stocks in the eastern tropical Pacific to recover as expected: (1) whether there have been changes to the ecosystem that have affected the ability of these stocks to recover, (2) current direct mortality levels, (3) whether stress or other indirect effects of the tuna fishery are affecting the ability of dolphin stocks to recover, and (4) the growth rates of the stocks. In making the final finding that the fishery is not having a significant adverse effect on the dolphin stocks, the Service had characterized the evidence as “mostly inconclusive.” The court, however, took a decidedly different view, concluding that “the Defendant’s effort to portray the record as providing even-handed support for either finding does not withstand scrutiny. Rather, while the record is hampered by limited data . . . a fair reading of the science that is available—and one that does not improperly ignore evidence simply because it is not conclusive—indicates that virtually all of the best available scientific evidence points toward a fishery having a significant adverse impact.”

The ruling also examined the integrity of the decision-making process used by the Service in reaching the final finding. Although the finding was to be based solely on the best available scientific data, the court found that the decision makers had been influenced by other policy concerns. Looking at the record as a whole, the court believed that there was ample evidence that the agency had sacrificed the integrity of the process by disregarding the best available science in favor of political and diplomatic considerations.

Based on its analysis, the court declared the final finding to be arbitrary, capricious, an abuse of discretion, and contrary to applicable law under the Administrative Procedure Act. Accordingly, the court directed that the term “dolphin-safe” will 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. Representatives of the Mexican and Venezuelan tuna industries also filed an appeal of that ruling although they had been denied the right to intervene in the matter by the district court. The Mexican tuna industry also appealed the district court’s ruling that denied its participation in the case, a matter which it was seeking to have resolved before the appeal on the merits of the case proceeded. As of the end of 2004 the Ninth Circuit Court of Appeals had yet to consider either matter. The status of Mexican and Venezuelan tuna fishermen to participate in the appeal is expected to be resolved early in 2005 and the briefing on the merits of the case is likely to begin during the first half of 2005.

In a second lawsuit discussed in last year’s annual report, *Defenders of Wildlife v. Hogarth*, the Court of Appeals of the Federal Circuit issued a ruling in June 2003 that upheld the regulations promulgated by the National Marine Fisheries Service to implement the International Dolphin Conservation Program Act. As of the end of 2003 a petition was pending before the U.S. Supreme Court to have it review one aspect of the case—whether the regulations could specify that, for sets encircling dolphins, the backdown procedure must be completed no later than one-half hour after sundown even though the applicable statutory provision clearly states that the backdown is to be completed “no later than 30 minutes before sundown.” The Supreme Court denied that petition on 3 May 2004.

## Regulations

The National Marine Fisheries Service published an interim final rule implementing the provisions of the International Dolphin Conservation Program Act on 3 January 2000. Based on comments received on that rule, the Service revised the regulations, publishing those changes in the *Federal Regis-*

ter on 13 September 2004. Changes from the interim rule were primarily technical in nature. They included (1) clarification that the International Review Panel established under the International Dolphin Conservation Program may recommend cases to the National Oceanic and Atmospheric Administration for possible prosecution but may not make recommendations concerning penalties or sanctions for such violations, (2) changes to the tuna tracking and verification provisions, including elimination of a provision that allowed dolphin-safe tuna and non-dolphin-safe tuna to be placed in the same well of a vessel under certain circumstances, and (3) reorganization of various provisions to eliminate duplication and potential inconsistencies.

A second rulemaking concerning the International Dolphin Conservation Program was initiated by the Service with the publication of a proposed rule on 29 October 2004. The proposed regulations track recent resolutions adopted by the parties to the international program. Among other things, the proposed regulations would implement domestically recent Inter-American Tropical Tuna Commission resolutions concerning the establishment of an international fleet capacity limit in the eastern tropical Pacific tuna fishery by specifying the requirements for U.S. vessels to be listed as active on the Tuna Commission's vessel register. The proposed rule would also enlarge the classes of vessels required to pay observer fees to include vessels under 400 short tons that harvest 50 percent or more of their annual catch of tuna in the eastern tropical Pacific. In addition, in an effort to improve enforcement of applicable labeling requirements, the Service proposed to prohibit commerce in tuna or tuna products bearing any mark that refers to dolphins or other marine mammals that does not comply with the applicable statutory marking and labeling requirements.

### **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. During 2003 affirmative findings were made for Mexico, Ecuador, and El Salvador, giving them access to the U.S. market through 31 March 2004. On 19 April 2004 the Na-

tional Marine Fisheries Service published a notice in the *Federal Register* that it had renewed the affirmative finding for El Salvador, allowing tuna imports to continue through 31 March 2005. Renewals of the affirmative findings for Mexico and Ecuador, covering the period through 31 March 2005, were published, respectively, on 6 August and 15 November 2004. 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, Spain, Vanuatu, and Venezuela.

Once an affirmative finding is made, it may be renewed up to four times. However, every five years each exporting country must submit a new application describing its tuna-dolphin program and compliance with the International Dolphin Conservation Program. Both Mexico and Ecuador will need to submit new applications to obtain affirmative findings for 2005 and the subsequent four-year period. El Salvador need not submit a new application until 2008.

Tuna embargoes are also to be imposed against nations that import yellowfin tuna from harvesting countries embargoed from importing tuna directly to 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.

## **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 167 countries have signed and ratified the agreement, with the most recent signatory nations being Laos, Samoa, Palau, and Syria.

The U.S. Fish and Wildlife Service is the lead agency for implementing the Convention in the United States. The National Marine Fisheries Service, the Marine Mammal Commission, the U.S. Customs Service, the Animal and Plant Health Inspection Service, the International Trade Administration, the U.S. Trade Representative, and other agencies provide technical expertise and participate in CITES meet-

ings, including conferences and technical meetings. U.S. positions and policies are coordinated through regular meetings of a CITES interagency coordination committee, on which the Marine Mammal Commission participates.

Under CITES, species are grouped into three appendixes depending on their conservation status, and trade in them is correspondingly regulated. Appendix I includes those species considered to be threatened with extinction and that are or may be affected by trade. Appendix II includes species that are not necessarily threatened with extinction but could become so unless trade in them is strictly controlled. Species may also be included on Appendix II if they 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 the 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. Species may be placed on Appendix III unilaterally by any party in the range of the species. CITES countries may propose adding or deleting species from the appendixes or transferring species from one appendix to another before any meeting of the Conference of the Parties.

### **Actions Taken at the 2004 Conference of the Parties**

The 13th meeting of the Conference of the Parties to CITES took place 2–14 October 2004 in Bangkok, Thailand. As it has done at previous meetings, Japan submitted a proposal to downlist three stocks of minke whales—the Okhotsk Sea/west Pacific stock, the northeast Atlantic stock, and the North Atlantic central stock—from Appendix I to Appendix II. It was Japan's position that, based on current population estimates, the three stocks cannot be regarded as threatened with extinction and do not meet the biological criteria for inclusion on Appendix I. Downlisting the stocks, Japan argued, would demonstrate that CITES makes its decisions on the basis of scientific and objective information, not for political reasons. If adopted, the Japanese proposal would have effectively allowed the reopening of international commercial trade in whale products. Japan has minke whale meat available for consumption as a result of its harvest of

approximately 700 minke whales for scientific purposes. As with past proposals to downlist whales under CITES, the United States opposed this proposal because of the need for consistency with conservation measures agreed to by the International Whaling Commission and the IWC moratorium on commercial whaling.

Japan's proposal to downlist Northern Hemisphere stocks of minke whales failed in committee by a vote of 67 in favor and 55 opposed, with 14 abstentions. Japan did not raise the issue during the following plenary session.

A second proposal involving a marine mammal species was submitted by Thailand, which proposed moving the Irrawaddy dolphin (*Orcaella brevirostris*) from Appendix II to Appendix I. The species occurs in a number of subpopulations in the tropical and subtropical marine waters of the Indo-Pacific and in freshwater populations in three river systems in Indonesia, Myanmar, and Laos/Cambodia/Vietnam (see Chapter V). Five of the subpopulations are either listed or proposed to be listed as critically endangered by the IUCN. Threats include entanglement in fishing gear and removal from the wild for live display. Thailand's proposal was adopted by a vote of 73 in favor and 30 against, with 8 abstentions.

### **CITES' Relationship to the IWC**

In recent years CITES parties 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 the IWC imposed a moratorium on the commercial take of large whales pending development of a Revised Management Scheme that would ensure adequate protection for affected whale stocks. The IWC 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 adopted a Revised Management Scheme for commercial whaling. Whaling nations and their supporters believe that there is a need for independent action under CITES using the Convention's own criteria when listing species on the appendixes without taking into consideration the views or actions of the IWC. The issue has become more important now that Norway has initiated the first international trade in whale products

in more than a decade by shipping to Iceland minke whale products from its commercial harvest, which is carried out under an objection that Norway filed to the IWC moratorium.

At the meeting in Bangkok, Japan introduced a resolution calling on the IWC to complete and implement a global plan for regulating and managing commercial whaling activities. The United States, the United Kingdom, and New Zealand voiced opposition to the language in the Japanese resolution that they considered critical of the IWC. The resolution was defeated in committee by a vote of 63 in favor and 57 against, with 13 abstentions.

### **Marine Mammal Species of Special Concern in International and Foreign Waters**

In addition to those species of special concern discussed in Chapter III, many marine mammal species and populations in other areas of the world also face major conservation challenges. Some are in danger of extinction in the foreseeable future, and others are being extirpated in parts of their range or consist of multiple populations that are being serially extirpated. Although the Marine Mammal Commission has not been directly involved in oversight or management of many such non-U.S. species and populations, we briefly discuss them in this report to provide the reader with a broader perspective on the conservation problems facing marine mammals globally.

The Commission selected the following species for discussion based on its impression of the severity of the threat of extinction. We lack a clear and consistent basis for a global ranking of extinction risks due to differences in criteria used by current classification schemes and the paucity of information about many stocks and species. We refer the reader to IUCN–The World Conservation Union for its well-known international classification scheme and to the list of endangered and threatened species under the U.S. Endangered Species Act as an example of a national scheme.

#### **Solomon Islands Bottlenose Dolphins**

The 2003 annual report described the capture of approximately 100 dolphins in the Solomon Islands and the subsequent export of 28 dolphins to a public

display facility in Mexico. The captured animals included both common bottlenose dolphins (*Tursiops truncatus*) and Indo-Pacific bottlenose dolphins (*T. aduncus*). Other species may have been captured as well. No documentation of capture operations was available, but personnel at the Solomon Islands Marine Mammal Education Center (the company operating the dolphin facilities) stated that no dolphin mortalities were associated with the capture operations. However, at least two animals died in holding pens at facilities in the Solomon Islands, one died in transit to Mexico, and at least one died at facilities in Mexico. At the invitation of the Solomon Islands government, two experts representing the International Whaling Commission's Cetacean Specialist Group and the IUCN's Veterinary Specialist Group conducted a fact-finding visit to the Solomon Islands in September 2003. The team visited dolphin-holding pens at facilities in Gavutu and Honiara and met with the staff of the Solomon Islands Marine Mammal Education Center.

A scientific assessment of population-level effects of dolphin removals was not conducted in advance of the dolphin live-capture operations. The visiting experts concluded that it was impossible to make a credible judgment about the impacts of the operations until the numbers and population structure of bottlenose dolphins in the region were assessed. For that reason, it was impossible to conclude that the removals were not detrimental to the populations, as required by CITES Article IV. Consequently, the team concluded that parties to the CITES agreement should not issue permits to import dolphins from the Solomon Islands.

Following the international controversy surrounding the dolphin exports in 2003, no live dolphins were exported from the Solomon Islands in 2004. The fate of the remaining dolphins captured in 2003 is unknown although they likely will be used in swim-with-the-dolphin programs run by the Center. It is possible that dolphins may be captured in the future for commercial operations within the Solomon Islands, and the effect of such capture operations on populations of dolphins in the vicinity is unknown. A general survey of cetaceans and associated habitats in the Solomon Islands was conducted in May–June 2004 as part of a “Solomon Islands rapid ecological assessment.” This survey provided useful information about the distribution of 11 cetacean species in

the Solomon Islands but was not designed to assess the populations of dolphins potentially impacted by live-capture operations.

### **Yangtze River Dolphin (Baiji)**

The Yangtze River dolphin or baiji (*Lipotes vexillifer*) is almost certainly the world's most endangered marine mammal and could conceivably go extinct in the next decade. Surveys by Chinese scientists in 1997, 1998, and 1999 resulted in observations of 17, 7, and 4 animals, respectively. Actual abundance is unknown but may be only tens of individuals. The baiji has already disappeared from large sections of the Yangtze River and associated lakes and waterways. To date, efforts to recover the species by captive maintenance and breeding have failed. Factors leading to the decline of the species and, perhaps, its extinction in the near future include habitat degradation, fragmentation, and loss due to waterway management (e.g., damming, explosions for establishing or maintaining channels); direct and indirect fisheries interactions (e.g., illegal electrical fishing, entanglement and hooking, competition for prey); vessel strikes; and contaminants.

A workshop on the conservation of baiji and finless porpoises was held 28 November–2 December 2004 in Wuhan, China. Participants discussed the current status of the species and the potential for creating a self-sustaining population of baiji in the Shishou Reserve (a 20-km oxbow adjacent to the Yangtze River) or the Wuhan dolphinarium. The Shishou Reserve is already used for maintenance of translocated finless porpoises (*Neophocaena phocaenoides*). Participants visited both sites. Although they disagreed about which site was more suitable for baiji, participants agreed that aggressive conservation measures, such as capturing and translocating baiji to a protected area, were necessary to prevent imminent extinction. A survey of the Yangtze River from Yichang to Shanghai is planned for 2005 to identify likely capture locations for baiji.

### **Vaquita**

The vaquita (*Phocoena sinus*) is the world's smallest porpoise and is currently found only in the northern reaches of the Gulf of California (Sea of Cortez). The species is listed as critically endangered by the IUCN and as endangered under Appendix I of the Convention on International Trade in Endangered Species, the Official Mexican Standards list of threat-

ened and endangered species, and the U.S. Endangered Species Act. Data collected in 1997 suggested a population size of approximately 567 vaquitas. The current abundance of vaquitas is unknown, but the International Committee for the Recovery of the Vaquita (Comité Internacional para la Recuperación de la Vaquita [CIRVA]) has estimated that the population likely has declined to between 268 and 464 vaquitas in 2004. Bycatch estimates derived from data collected between 1993 and 1995 suggest that, on average, 39 vaquitas were killed in fisheries annually during that period. Such high levels of human-related mortality cannot be supported by such a small population of slow-reproducing mammals. Other possible contributors to the decline in abundance include the effects of contaminants, inbreeding depression, and decreased productivity (and therefore food availability) due to reduced flow of the Colorado River into the northern Gulf. None of these currently appears to be an important factor because vaquita contaminant levels are relatively low, the existing evidence does not indicate inbreeding depression, and all the animals that have been assessed appear to be in good condition, suggesting that they are not stressed by lack of prey. Further, nutrient concentrations and productivity levels in the northern Gulf are among the highest worldwide for subtropical latitudes.

Recovery efforts are being 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, met for the first time in 1997, and focused initially on scientific research to assess abundance, distribution, and potential threats. Since its second meeting in 1999, CIRVA has focused almost entirely on the need to reduce fishery bycatch. At the second meeting, it recommended phasing out all gillnet and trawl fisheries in the Mexican Biosphere Reserve in the northern Gulf of California and extending the reserve to ensure that it encompasses all known vaquita habitat. Attempts to eliminate fishery bycatch have been delayed by concerns regarding the potential socioeconomic consequences of necessary changes to the fisheries and their management. Potential solutions under consideration include buyouts of gillnet and trawl fishermen, development of dolphin-safe fishing gear, and development of alternatives to fishing that will provide socioeconomic choices for fishermen from the three main fishing communities in the northern Gulf.

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 January 2004. During this last meeting, CIRVA reviewed and replied to criticism from fishing authorities and industry regarding estimates of abundance, distribution, bycatch, and status of vaquitas. CIRVA concluded that the vaquita population has continued to decline, and the species' status is almost certainly worse now than was believed in 1999. CIRVA therefore reiterated and strengthened its expression of grave concern that the species will remain in serious danger of extinction in the near future unless strong conservation measures are implemented immediately by the Government of Mexico.

### Finless Porpoise

The finless porpoise (*Neophocaena phocaenoides*) has generally been recognized as one species with three forms (subspecies) but may actually consist of two species, each with its own subspecies. They are distributed in shallow, coastal waters from Japan to the Persian Gulf and south to East Timor, and are known to enter estuaries and rivers. One form occurs in the Yangtze River and associated lakes. The finless porpoise is listed by the IUCN as "data deficient," and the Yangtze River population is listed as endangered. The species' overall abundance is unknown, but evidence suggests that it is severely reduced and may have been extirpated in parts of its range. The primary threat appears to be fisheries bycatch, particularly in gillnets. Other potential factors include other forms of fisheries interactions (e.g., electrical fishing in the Yangtze River, reductions in prey from overfishing), habitat degradation, waterway management, and high levels of contaminants.

A small number of finless porpoises was captured and relocated to the Shishou Reserve in the Yangtze River in the early 1990s, and they seem to be surviving and reproducing well, despite problems with water quality and fishing in the reserve. A workshop on the conservation of baiji and finless porpoises was held 28 November–2 December 2004 in Wuhan, China. Participants discussed the current status of both species and necessary modifications to improve the quality of the Shishou Reserve as a habitat for both. A survey of the Yangtze River from Yichang to Shanghai is planned for 2005 and is expected to provide an estimate of abundance of finless porpoises in that portion of the river.

### Ganges and Indus River Dolphins

The taxonomic status of the Ganges and Indus River dolphins is not clear. Currently scientists consider them subspecies (*Platanista gangetica gangetica* and *P. gangetica minor*, respectively), but they also have been, and may again be, considered separate species (*P. gangetica* and *P. minor*) after further review. They occur separately in the Indus River (Indus River dolphin) and the Ganges-Brahmaputra-Meghna and Karnaphuli-Sangu river systems (Ganges River dolphin). Both are considered to be endangered by the IUCN. Data collected in 2001 indicate a population of approximately 965 Indus River dolphins. No population estimate is available for the Ganges River dolphin, but surveys of portions of the subspecies' range suggest a minimum abundance of 1,200 to 1,800 animals and possibly several times that many.

The Indus River dolphin has been extirpated from about 80 percent of its historical habitat, and the Ganges River dolphin has been nearly extirpated in Nepal. Threats to these species include fisheries interactions (e.g., entanglement in fishing gear, competition for prey), habitat fragmentation, degradation and loss by development, pollution (e.g., agricultural runoff, human sewage), and direct killing for various purposes (e.g., for meat and oil to use as bait for fisheries or medicinal purposes). The impact of waterway management (barrages, damming, and diversion for agriculture and other human activities) is of particular concern with regard to habitat fragmentation, degraded downstream habitat, and declining freshwater flows in both the Indus and Ganges Rivers. In the Ganges, this threat will potentially become much greater if India proceeds with the Rivers Interlink Water Transfer Project, a project designed to link the major rivers of India to control water distribution and flow. The Commission has provided funding to support an investigation into the potential effects of declining freshwater flows on Ganges River and Irrawaddy dolphins in the Sundarbans Delta as a result of this major waterway management project (see Chapter VIII).

### Irrawaddy Dolphin

Irrawaddy dolphins (*Orcaella brevirostris*) are distributed sparsely in tropical and subtropical estuaries and the waterways of mangrove forests in the Indo-Pacific. In addition, freshwater populations occur in the Mahakam, Ayeyarwady (formerly Irrawaddy), and Mekong River systems and Songkhla and Chilka Lakes. Five isolated subpopulations are

considered to be critically endangered by the IUCN, with populations of fewer than 100 animals each. These subpopulations are located in the Ayeyarwady River (59 animals), Mahakam River (33–50 animals), Malampaya Sound (77 animals), Mekong River (69 animals), and Songkhla Lake (<50 animals). Threats to these dolphins are similar to those facing Ganges and Indus River dolphins, including fisheries interactions, habitat fragmentation, degradation and loss by development, pollution, waterway management, and direct killing for various purposes. The primary threat for Irrawaddy dolphins seems to be mortalities caused by entanglement in fishing gear, particularly gillnets. Several local, national, and international conservation efforts are under way to provide some protection for the species. As mentioned above, the Commission has provided funding to support an investigation into the potential effects of declining freshwater flows on Ganges River and Irrawaddy dolphins in the Sundarbans Delta as a result of India's proposed Rivers Interlink Water Transfer Project (see Chapter VIII).

### **Hector's Dolphin**

Hector's dolphins (*Cephalorhynchus hectori*) are found in nearshore waters of New Zealand, with the vast majority of the species (3,000 to 4,000 dolphins) located around the South Island. The North Island population of Hector's dolphins is genetically distinct from all South Island populations and probably merits consideration as a subspecies. The North Island population consists of fewer than 100 dolphins, and it is considered to be critically endangered by the IUCN. The primary threat to Hector's dolphins is fisheries bycatch, particularly in gillnets; the North Island population may have declined by two-thirds as a result of fisheries bycatch since 1970. Other threats include pollution, disease, ship strikes, and habitat degradation.

### **Western North Pacific Gray Whale**

(See discussion earlier in this chapter.)

### **Bowhead Whale**

The five stocks of bowhead whales recognized by the International Whaling Commission were severely depleted by commercial whaling. The Bering-Chukchi-Beaufort Sea stock has recovered, with a current population of approximately 10,500 whales. Estimates suggest that population sizes for the other four stocks may still be fewer than 500 whales each. The Svalbard-Barents Sea (Spitzbergen) stock is

classified as critically endangered by the IUCN and probably has fewer than 100 whales and fewer than 50 reproductively mature animals. The Okhotsk Sea stock may have 100–200 whales and is classified as endangered, as is the Davis Strait-Baffin Bay stock, which probably contains no more than 400 to 500 whales. The Hudson Bay-Foxe Basin stock may number fewer than 300 whales and is classified as vulnerable. Bowhead whales are migratory and associate closely with arctic sea ice. Threats to bowhead stocks include fisheries interactions (i.e., entanglement in fishing gear), changes to habitat due to global warming, disturbance due to human-generated noise, ship strikes, and contaminants from pollution.

### **Mediterranean Monk Seal**

The Mediterranean monk seal (*Monachus monachus*) has been referred to as Europe's most endangered marine mammal. 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 species recognized in the genus *Monachus*: the Caribbean monk seal (*M. tropicalis*) is considered extinct, and the Hawaiian monk seal (*M. schauinslandi*) is highly endangered, with a population of about 1,250 seals.

Recent estimates suggest a total population of perhaps 443 to 500 Mediterranean monk seals, with approximately 250 to 300 in the eastern Mediterranean, 15 to 20 in the western Mediterranean, and 178 to 182 in the Atlantic. Before 1997 the largest single colony was in waters off the western Sahara on Africa's northwestern coast. A mass mortality at that site in 1997, attributed possibly to morbillivirus or saxitoxin, reduced the colony by one-half to two-thirds.

The Mediterranean monk seal has been extirpated through much of its range, and the population is now highly fragmented. Certain populations will almost certainly go extinct in the near future. Significant threats to the species include habitat degradation and loss, fisheries interactions (entanglement in fisheries gear and, particularly, shooting by fishermen who perceive the monk seal to be a competitor), disease (e.g., morbillivirus), harmful algal blooms, disturbance, and lack of international cooperation and coordination with respect to management and research.

### **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 carve out lairs in snowdrifts overlying these holes. Snowdrifts, however, only form along the shore of Lake Saimaa and islands within the lake. As a result, seal lairs, including those used for birthing and nursing pups, are all located near shore and are susceptible to the impact of shoreline development. The current abundance is estimated at 270 seals, including 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 of seals was allowed prior to 1955 and was considered the primary threat to their conservation. In the 1960s and 1970s the effects of contaminants, mainly mercury, were viewed as potential causes for reduced pup survival. Entanglement in recreational fishing gear (gillnets) has more recently become a significant source of mortality. In addition, development around the lake, associated disturbance, and water management practices are thought to pose a threat by degrading habitat, altering ice conditions, and threatening birthing lairs. In particular, abnormal variations in water levels can cause the ice near shore to break, which also causes disruption and possible collapse of seal lairs. If this occurs during the pupping season, pups must survive without lairs until new snowdrifts form and the lairs can be recreated. Up to 44 percent of pups can die as a result of widespread lair disruption, but pup mortality is usually about 10 percent. Various protective measures have been implemented to control fishing seasons and locations, establish protected areas, manage water levels more conservatively, and raise awareness of conservation needs. As a result, the population has grown 2.8 percent per year during the period 1990–2004.

### West African Manatee

The West African manatee (*Trichechus senegalensis*) is currently considered the most threatened of the three manatee species. It is distributed in coastal regions, estuaries, and rivers from Senegal to Angola, occurring in saltwater, brackish, and freshwater areas. These animals are herbivorous and consume floating, overhanging, and emergent vegetation rather than submerged vegetation. Abundance is unknown, but the species is thought to be declining throughout much of its range and may have been extirpated in some countries. Factors causing decline or threatening the species' future include hunting, bycatch, or

entanglement in fishing gear, habitat degradation and loss (e.g., mangrove and forest clearing with resulting siltation and filling of estuaries and lagoons), and waterway management (e.g., building of dams and flood control structures). Currently the West African manatee is listed as vulnerable by the IUCN. The Marine Mammal Commission is helping to sponsor a sirenian workshop at the Ninth International Mammalogical Congress in 2005 to review the status of all manatee and dugong subspecies and update the IUCN classifications (see Chapter VIII, Research and Study Projects).

### Okinawan Dugong

The dugong (*Dugong dugon*) is the only extant member of the family Dugongidae. It is distributed from East Africa to Vanuatu in shallow coastal waters between 26 °N and 26 °S latitudes. On a global basis, it is listed as vulnerable to extinction by the IUCN. Although the dugong can still be found in many regions of its historical range, it has been extirpated throughout much of that range and now generally occurs in fragmented, declining populations. Its near-shore habitat and dependence on sea-grass beds for food (it is herbivorous) make it particularly vulnerable to human-related mortality and habitat degradation. A small population still occurs along the northeastern coast of Okinawa. The size of this population is unknown, but recent surveys have sighted fewer than a dozen animals. The Okinawan dugong has been listed by the Government of Japan as a “Natural Monument,” and it is considered an important component of the culture and history of native Okinawans.

The Government 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. To date, the primary site under consideration is an offshore airstrip to be built on top of coral reefs and sea-grass beds within the habitat used by the Okinawan dugong. Construction of the base poses threats to this population due to disturbance, loss of sea-grass beds, pollution, noise, and watercraft activities. The IUCN recommended in 2000, and again in 2004, that Japan complete a review of the potential environmental effects of the base construction, including preconstruction activities such as underwater drilling and seismic surveys, before initiating those activities. Japan has initiated an environmental assessment, but the review apparently had not been completed at the end of 2004. A pre-con-

struction 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. However, the construction of footholds for drilling equipment has damaged coral and reefs at more than 30 locations in the area. A coalition of conservation groups filed a lawsuit against the U.S. Department of Defense (*Okinawa Dugong v. Rumsfeld*) in September 2003. Oral arguments on the defendant's motion to dismiss were heard in August 2004, but a ruling had not been made at the end of 2004. Okinawa residents also filed a lawsuit in the Japanese court system in December 2004, demanding that Japan halt the seabed drilling survey. This suit also was pending a final decision at the end of 2004.

### **Marine Otter**

The marine otter (*Lontra felina*) is distributed along the western coast of South America from central Peru to the southern tip of Chile. It is cryptic and occurs in rocky coastal areas with strong winds and heavy surf or rough shoreline conditions. Its historical distribution included the southern coast of Argentina. Although its range is still relatively substantial, it is rare and has been extirpated from much of the area within that range and now occurs in fragmented, isolated populations. Its current abundance is undetermined. Threats to the marine otter include poaching for its fur, fisheries interactions (entanglement in fishing gear and shooting by fishermen who consider the otters to be competitors for fish and shellfish), and reductions of prey due to kelp harvesting.

## Chapter VI

# STRANDINGS AND MARINE MAMMAL UNUSUAL MORTALITY EVENTS

Unusual mortality events involving marine mammals appear to have increased in frequency and scale over the past several decades. The apparent increase may be due to actual increases in mortality, more extensive observation, better reporting, or some combination of these. Events have been documented in the United States and around the world for a wide range of species and may involve from a few to thousands of animals. Unusual mortality events can have a devastating impact on marine mammal populations, particularly those that are already threatened or endangered.

Mortality events are triggered by a variety of factors, both natural and human-related. The distinction between human-related and natural factors is difficult to discern because human activities may indirectly affect the occurrence of otherwise natural factors, causing mortality events. For example, the frequency, severity, and location of toxic algal blooms may be changing as a consequence of global warming and marine pollution.

Some mortality events are caused by disease. Morbilliviruses (which cause distemper in dogs, measles in humans, and rinderpest in hoofed mammals) are thought to be responsible for several recent events involving Mediterranean monk seals, harbor seals, bottlenose dolphins, and striped dolphins. Severe outbreaks may have occurred because cetaceans and pinnipeds have been exposed to these viruses only recently and thus have not acquired immunity to them. Alternatively, more virulent forms of the viruses may be evolving.

High levels of environmental contaminants also may contribute to mortality events. Contaminant levels are especially high in top-level predators such as killer whales and polar bears. Levels of polychlorinated biphenyls in killer whales exceed levels found to have adverse effects in harbor seals and have been

correlated with changes in reproductive hormone levels in polar bears. Because contaminants can reduce immune system function, they may predispose marine mammals to disease and thereby increase levels of mortality. Human-related activities and events, such as oil spills and operation of powerful sonars, also may cause mortality events. Thus, mortality events may be caused by single or multiple factors.

### **Working Group on Marine Mammal Unusual Mortality Events**

The Marine Mammal Health and Stranding Response Act of 1992 directed the Secretary of Commerce to (1) establish an expert working group to provide advice on measures necessary to better detect and respond appropriately to future marine mammal unusual mortality events (UMEs), (2) develop a contingency plan for guiding responses to such events, (3) establish a fund to compensate people for certain costs incurred in responding to unusual mortality events, (4) develop objective criteria for determining when sick and injured marine mammals have recovered and can be returned to the wild, (5) continue development of the National Marine Mammal Tissue Bank, and (6) establish and maintain a central database for tracking and accessing data concerning marine mammal strandings. The 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 composed of marine mammal experts from around the country. The Service consults the group whenever increases in stranding rates or other factors suggest that an unusual mortality event may be occurring.

The group held its first meeting in April 1993 and has met annually since then. Its past activities have been described in previous annual reports. The most recent meeting took place 28–30 July 2004 in Washington, D.C. The group reviewed mortality events in 2003 and 2004, including large whales in the Gulf of Maine, minke whales and harbor seals along the coast of Maine, small cetaceans along the Virginia coast, pygmy and dwarf sperm whales in the southeastern United States, manatees in southwestern Florida, bottlenose dolphins along the Florida panhandle, and southern California sea otters. At the 2004 meeting, the group also proposed modifications to the criteria it uses to evaluate stranding events and declare unusual mortality events and established subcommittees to develop both a standardized action plan for a UME response team and templates for the stranding networks to use when initiating consultation and preparing final reports. The modified criteria proposed by the working group are as follows:

- A marked increase in the magnitude or a marked change in the nature of morbidity, mortality, or strandings is found when comparing the event with prior records.
- A temporal change in morbidity, mortality, or strandings is occurring.
- A spatial change in morbidity, mortality, or strandings is occurring.
- 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 pathologic findings, behavior patterns, clinical signs, or general physical condition (e.g., blubber thickness).
- 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). For example, a stranding of three or four right whales may be cause for great concern whereas a stranding of a similar number of fin whales may not.
- Morbidity is observed concurrent with or as part of an unexplained continual decline of a marine mammal population, stock, or species.

Finally, the group made several recommendations for improving administration of the UME program, including: (1) providing support for the national stranding database, (2) addressing the inconsistent quality of stranding records and reporting among re-

gions, (3) providing increased training opportunities for the stranding networks in specific geographic areas, (4) providing increased training in data management during UMEs, (5) ensuring that all UMEs are included in the administrative record, (6) making the working group's executive secretary a fulltime position, (7) continuing to support the Prescott grant program, which helps fund stranding networks and assists with preparedness for UME responses, (8) requesting changes to the Marine Mammal Protection Act to allow the UME fund to be used for a wider range of needs (e.g., carcass disposal), (9) increasing recognition of the value of investigating UMEs, and (10) developing an overview report on the UME program.

## Unusual Mortality Events in 2004

At least four separate incidents involving unusually high levels of mortality of marine mammals occurred during 2004. The events and the species affected are described here.

### Bottlenose Dolphins in Florida

From 10 March–13 April 2004, 107 bottlenose dolphins (*Tursiops truncatus*) stranded dead along the Florida panhandle, and hundreds of dead fish and marine invertebrates also were found in the area. The UME working group formally declared the die-off to be a UME on 15 March. The event apparently was caused by brevetoxins, which are naturally occurring neurotoxins produced by the dinoflagellate *Karenia brevis*, also known as the Florida red tide. A similar dolphin mortality event occurred in 1999–2000 and was associated with a bloom of *K. brevis*. Most stranded dolphins in the 2004 event were found with full stomachs, indicating recent feeding, and brevetoxins were found in high concentrations in stomach samples, consistent with concentrations measured in previous marine mammal mortality events associated with Florida red tides. Domoic acid was also present in stomach samples but at levels too low to be a primary cause of the mortalities. Further testing suggested that the mortalities were not caused by disease, leaving brevetoxin as the most likely primary cause.

Satellite imagery indicated a phytoplankton bloom in the northern Gulf of Mexico immediately preceding the strandings (9–11 March), but the species composition of the bloom could not be determined. Water samples collected during the mortality

event (after 10 March) had low levels of brevetoxin but did not contain significant quantities of *K. brevis*. The water samples did contain low-to-moderate concentrations of a domoic-acid producing diatom, *Pseudo-nitzschia delicatissima*. It seems likely that the phytoplankton bloom prior to the strandings included *K. brevis*, but it is not clear why so many dolphins were affected by the toxin. The occurrence of *K. brevis* blooms off southwestern Florida appears to have increased over time, but such blooms are not always associated with dolphin mortality. An interim report on the event was provided to Congress and the public in June 2004. A final report is being prepared and should be available in 2005.

### Harbor Seals in Maine

The number of harbor seal (*Phoca vitulina*) strandings along the coast of Maine has increased rapidly since 2001. The majority of the stranded seals was dead when found (Fig. 19). In 2003 the proportion of those seals that were adults also increased (Fig. 20). As a result, an unusual mortality event was declared for Maine harbor seals in 2003. The majority of strandings was reported in southern Maine. From May through December 2003, 66 stranded adult harbor seals were reported from Boothbay south to the

New Hampshire border. The seasonal and regional pattern of strandings in Maine in 2003 was similar to those in previous years, but the overall number of harbor seal strandings (94 live, 166 dead) was more than three times the average from 1996 to 2000 (54 live, 24 dead) (Fig. 19). No consistent cause of death could be determined for stranded animals in 2003 although most animals were too decomposed for evaluation.

The 2003 unusual mortality event of harbor seals in Maine continued into 2004. The total number of strandings increased, as did the number of dead strandings and the number of adult strandings (Figs. 19 and 20). From January to November 2004, 291 harbor seals were found dead and 143 seals were found stranded but alive on Maine beaches. The majority of strandings again occurred in southern Maine, primarily from Rockland south to the New Hampshire border. However, a few stranded animals were also found as far south as Cape Ann, Massachusetts. A pulse of 37 dead animals was found on or near Stratton Island, Maine, between 15 and 26 August 2004. The majority of those seals were adults and were found within one small cove on the island. Necropsies were conducted on 15 of them, but no consistent cause of death could be determined due, in part, to substantial decomposition of many of the carcasses. At the end of 2004

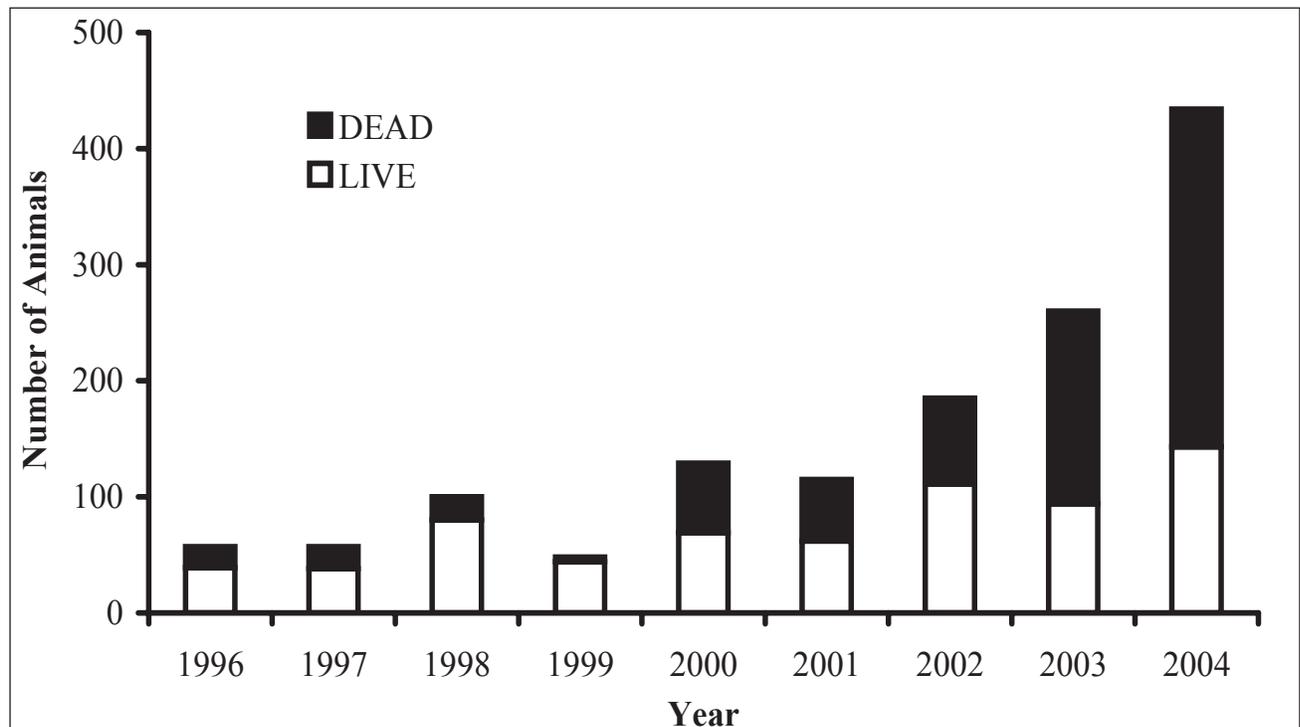


Figure 19. Number of dead and live harbor seal strandings reported in Maine during 1996–2004, based on data from the National Marine Fisheries Service’s national stranding database.

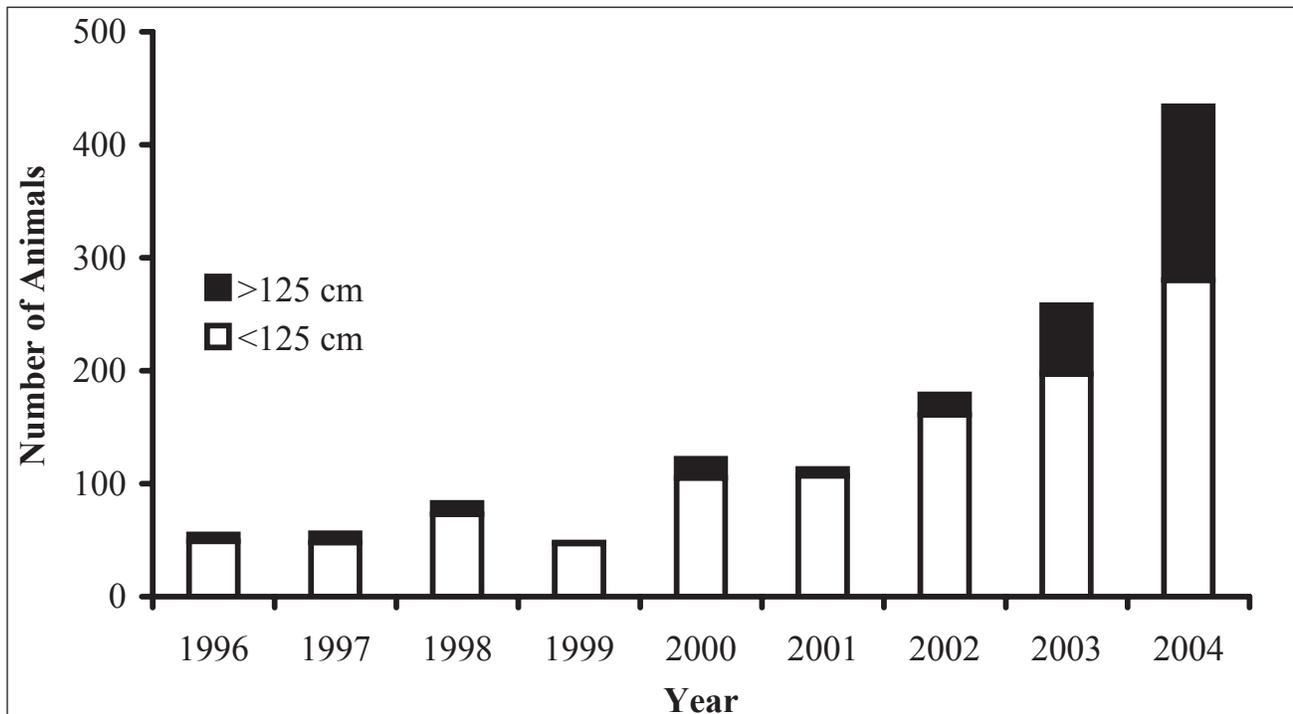


Figure 20. Number of adult (>125 cm length) and subadult (<125 cm) harbor seal strandings reported in Maine during 1996–2004, based on data from the National Marine Fisheries Service’s national stranding database.

stranding records suggested that the unusual mortality event for Maine harbor seals may have ended, but an official determination had not been made.

**Small Cetaceans along the Atlantic Coast**

Thirty-six small cetaceans stranded along the coast from Maryland to Georgia between 3 July and 2 December 2004. Stranded species included 15 pygmy sperm whales (*Kogia breviceps*), 1 dwarf sperm whale (*K. sima*), 8 offshore bottlenose dolphins (*Tursiops truncatus*), 3 short-beaked common dolphins (*Delphinus delphis*), three Risso’s dolphins (*Grampus griseus*), 1 Clymene dolphin (*Stenella clymene*), 1 pantropical spotted dolphin (*S. attenuata*), 1 short-finned pilot whale (*Globicephala macrorhynchus*), 1 unidentified pilot whale (*Globicephala* sp.), 1 Sowerby’s beaked whale (*Mesoplodon bidens*), and 1 unidentified small cetacean that was pushed off the beach alive. These species usually are found far offshore and are generally not expected to strand along the coast. The UME working group declared the strandings to be an unusual mortality event on 20 August 2004.

The high stranding rate of pygmy and dwarf sperm whales in 2004 raised particular concern because both species had stranded in relatively high numbers along the southeastern Atlantic coast in

2003 (discussed in the Commission’s previous annual report). Preliminary results from necropsies indicate that several of the bottlenose dolphins and the Clymene dolphin that stranded in North Carolina exhibited inflammation in the spinal cord and brain. The cause and frequency of occurrence of this inflammation is not yet known because some of the carcasses had not been fully analyzed by the end of 2004. A final report on this unusual mortality event is expected to be available in 2005.

**Small Cetaceans off Virginia**

From May to July 2004, 66 small cetaceans were found stranded along the coast of Virginia, mostly along the outer (eastern) coast of Virginia’s barrier islands. They included 52 bottlenose dolphins, 4 harbor porpoises (*Phocoena phocoena*), 4 common dolphins, 4 Atlantic white-sided dolphins (*Lagenorhynchus acutus*), 1 Risso’s dolphin, and 1 pilot whale. Additional animals stranded from August through December but at rates similar to those of previous years. The UME working group declared the strandings to be an unusual mortality event on 20 July 2004.

The high stranding rate of bottlenose dolphins was particularly worrisome. Samples were collected from many of the carcasses to determine if the animals

were from the coastal stock or the offshore stock. Human interactions were implicated in 17 of the strandings (1 common dolphin and 16 bottlenose dolphins). Other causes were implicated in 14 of the strandings (1 Atlantic white-sided dolphin, 2 harbor porpoises, and 11 bottlenose dolphins), and the cause could not be determined for the rest of the strandings.

Among those involving human interactions, fishing interactions were the most common—five bottlenose dolphins and a common dolphin were entangled in pound nets when they stranded, three bottlenose dolphins were entangled in unidentified netting or lines, and one bottlenose dolphin was entangled in pot gear. In addition, two bottlenose dolphins were found with cinder blocks tied to their flukes, one on Cedar Island (19 June 2004) and the other in the Chincoteague National Wildlife Refuge (12 July 2004), and a third was found with a frayed line tied to its flukes (Wallops Island, 20 July 2004). National Marine Fisheries Service enforcement officers were notified of the cases where cinder blocks were tied to the animals, and an investigation is ongoing. A final report on this unusual mortality event, including any determination of the cause or causes, is being prepared and should be available in 2005.

### Harbor Porpoises off California

In 2004, 36 harbor porpoises stranded along the coast of California, primarily in northern California between Point Reyes and Ocean Dunes. In recent years, strandings have averaged fewer than 20 per year, except for years with active gillnet fisheries (20 to 40 strandings in those years). An unusually large number of strandings occurred in June (7) and early July (8 from 1 to 12 July), prompting the National Marine Fisheries Service to request consultation with the Working Group on Marine Mammal Unusual Mortality Events. The working group reviewed the available information and recognized an increase in strandings but did not declare an unusual mortality event pending the receipt of more complete information. Stranding response was not hindered by the lack of a formal declaration. The California marine mammal stranding network was able to respond to strandings and conduct necropsies. No consistent cause was determined for the strandings; 6 were caused by fishery interactions, 22 were not related to human in-

teractions, and the cause could not be determined for 8 of the strandings. At the end of 2004 the working group had not received the necessary information for a complete analysis.

### 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 initial authorization was for fiscal years 2001, 2002, and 2003. The program provides financial assistance for marine mammal stranding network participants to carry out critical activities including (1) recovery or treatment of stranded marine mammals, (2) collection of data from living and dead stranded marine mammals, and (3) operational costs directly related to those activities. Awards may be granted for up to three years with a cumulative total of \$100,000 per eligible participant per year.

The National Marine Fisheries Service and the Fish and Wildlife Service administer the grant program. Early in 2003 the National Marine Fisheries Service solicited applications under the Prescott grant program for fiscal years 2003 and 2004. Technical and merit review panels met between May and July 2003 to review the 89 proposals received. The Commission participated on the review panels. Of the approximately \$5 million available to the Service in 2003, approximately \$4.5 million was committed to funding 48 proposals in 2003. An additional 31 proposals totaling \$2.7 million were funded in 2004; thus a total of 79 of the 89 proposals was funded for a total of \$6.2 million over the two years. On 30 June 2004 the National Marine Fisheries Service published in the *Federal Register* a solicitation for applications under the Prescott grant program for fiscal year 2005. Ninety-five proposals were received.

The Department of the Interior's budget request for fiscal years 2001–2005 did not include a request for Prescott funds, and no funds were appropriated to the Fish and Wildlife Service for that purpose in those years.

## Release Criteria for Rehabilitated Animals

Section 109(h) of the Marine Mammal Protection Act provides the statutory basis for much of the National Marine Fisheries Service's and the Fish and Wildlife Service's stranding response programs. That provision authorizes federal, state, and local government officials and those designated by the Service to take marine mammals when necessary for (1) the protection or welfare of the mammal, (2) the protection of the public health and welfare, and (3) the nonlethal removal of nuisance animals. It further specifies that, "[i]n any case in which it is feasible to return to its natural habitat a marine mammal taken . . . under [this provision], steps to achieve that result shall be taken." Because it may not always be clear when such animals are releasable, Congress included a provision in the 1992 Marine Mammal Health and Stranding Response Act directing the Secretary of Commerce, by 4 November 1994, to "develop and implement objective criteria to determine at what point a marine mammal undergoing rehabilitation is returnable to the wild."

As discussed in previous annual reports, the Service developed draft release criteria in 1997 in

conjunction with the Fish and Wildlife Service and in consultation with marine mammal biologists, behaviorists, and veterinarians. The draft criteria were published for review and comment in 1998 and, although revised to address comments received from the public and two expert advisory panels, they were never finalized. The lack of objective criteria for the release of animals has led to confusion and controversy with regard to the release of certain marine mammals, arguably placing those animals and the wild populations to which they were returned at unreasonable levels of risk. The completion of such 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.

At the end of 2004 the National Marine Fisheries Service had revised the draft release criteria again and submitted them to the Fish and Wildlife Service for review. If the Fish and Wildlife Service concurs with this most recent draft, the National Marine Fisheries Service will either proceed with publication of the draft criteria in the *Federal Register* for additional public comment or commence with environmental review of the criteria under the National Environmental Policy Act (i.e., environmental assessment) and the Endangered Species Act (i.e., section 7 consultation).

## Chapter VII

# REAUTHORIZATION OF THE MARINE MAMMAL PROTECTION ACT

The Marine Mammal Protection Act was enacted in 1972. Since then, it has been amended and reauthorized several times. The most recent authorization, enacted in 1994, extended appropriation authority for carrying out the provisions of the Act through fiscal year 1999. Although the Act has not been reauthorized since then, its provisions remain in effect and Congress continues to appropriate funds to carry out its mandates.

As a matter of course, Congress examines the implementation of the Act during the reauthorization process. It is not uncommon for amendments to be made at such intervals. For example, major amendments were enacted in 1984, 1988, and 1994, the last three times the Act was reauthorized. The Act may also be amended at other times, as it was in 1997 when significant changes were made to the Act's tuna-dolphin provisions.

Congress began the process to reauthorize the Marine Mammal Protection Act in 1999. As discussed in previous annual reports, 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 the 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 appendixes of previous annual reports.

### **Administration Bill**

The Marine Mammal Commission and the other federal agencies with primary responsibilities under the Act entered into interagency discussions beginning in 1999 to identify issues that they believed merited attention during the reauthorization of the Marine Mammal Protection 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 and 2002. With the convening of the 108th Congress in 2003, the Administration determined that it was necessary to resubmit a reauthorization bill. Thus, on 21 February 2003 the General Counsel of the Department of Commerce transmitted to Congress the Administration's recommended reauthorization bill, entitled "The Marine Mammal Protection Act Amendments of 2003." The bill was substantively identical to the bill transmitted to Congress by the Administration in 2002 and would authorize appropriations for the Marine Mammal Commission, the Department of Commerce, and the Department of the Interior to carry out their responsibilities under the Act through fiscal year 2007. In addition, the bill recommended extensive revisions to the Act to address various problems that had arisen since the last reauthorization and to clarify certain provisions of the 1994 and 1997 amendments. It is expected that the Administration will submit a new recommended reauthorization bill to the 109th Congress in 2005 that is identical or very similar to the 2003 bill.

The main provisions of the 2003 bill are described in this section. The full text of the proposed amendments, as well as the accompanying statement

of purpose and need, can be found at the National Marine Fisheries Service's Web site ([http://www.nmfs.noaa.gov/pr/readingrm/MMPAReauth/mmpa\\_bill\\_2003.pdf](http://www.nmfs.noaa.gov/pr/readingrm/MMPAReauth/mmpa_bill_2003.pdf) and [http://www.nmfs.noaa.gov/pr/readingrm/MMPAReauth/mmpa\\_sectional\\_2003.pdf](http://www.nmfs.noaa.gov/pr/readingrm/MMPAReauth/mmpa_sectional_2003.pdf)).

**Management of Taking by Alaska Natives—**

A central provision of the Administration bill is the harvest management provision worked out by the National Marine Fisheries Service, the Fish and Wildlife Service, the Marine Mammal Commission, and representatives of the Alaska Native hunting community. Unlike existing section 119, which currently enables the National Marine Fisheries Service and the Fish and Wildlife Service to enter into cooperative agreements with Alaska Native organizations, the harvest management agreements that would be available under the new provision would be enforceable by both parties, i.e., the federal agency and the Alaska Native organization. Thus, any limitation on when, where, how, or how many marine mammals may be taken that was agreed to by the parties to the agreement would be binding on all members of the Alaska Native tribes or organizations that are signatories to the agreement. Currently, such limitations can be established only after the affected marine mammal stock has been determined to be depleted and, even then, only through formal rulemaking. Harvest management agreements would be limited to Alaska Native tribes or tribally recognized organizations as a means of ensuring that the Native party had sufficient authority to enforce the agreement with respect to its membership. The proposed amendment would require the Service to provide draft regulations to harvest management partners before imposing any restrictions on Native taking and to seek their advice before making a depletion finding concerning any species or stock covered by such an agreement. In addition, the proposed amendment would (1) provide for cooperative enforcement by the Services and Native organizations, (2) provide an opportunity for public review and comment prior to approval of a co-management agreement, and (3) authorize specific funding to carry out the new provisions.

**Cultural Exchanges and Exports—**As part of a package of permit-related amendments enacted in 1994, Congress added a provision to prohibit the export of marine mammals for purposes other than public display, scientific research, or enhancing the survival of a species or stock. Although this prohibition is subject to exceptions set forth elsewhere in the

Act, it was added late in the 1994 reauthorization process, and its drafters neglected to include any such exceptions. Thus, certain types of exports that had been permissible before 1994 arguably could no longer be authorized.

The 1994 amendments also added section 101(a)(6) to the Act to allow marine mammal products to be imported into the United States if they are (1) legally possessed and exported by a U.S. citizen in conjunction with foreign travel, (2) obtained by an Alaska Native outside the United States as part of a cultural exchange, or (3) owned by a Native inhabitant of Russia, Canada, or Greenland and are being imported for noncommercial purposes in conjunction with personal travel or as part of a cultural exchange with an Alaska Native. However, the drafters of this provision did not anticipate enactment of an export prohibition. Thus, many U.S. citizens may not be able to avail themselves of the import provision because they could not have legally exported the item in the first place. Similarly, Natives from other countries who bring marine mammal items into the United States under this provision may face difficulties when they try to export those items upon departure.

To address some of these problems, the Administration's proposed bill would amend several sections of the Act to indicate when exports of marine mammals or marine mammal products are allowed. The bill would authorize exports related to a waiver of the Act's moratorium on taking or importing marine mammals. The proposal would also clarify that permits may be issued to authorize the export of marine mammals for purposes of public display, scientific research, and species enhancement. Although such exports are currently allowed, the existing provisions are geared toward transfers of marine mammals from U.S. facilities, which do not require a permit, rather than the take of marine mammals from U.S. waters for direct export to foreign facilities. The proposed amendments to section 104 would supplement the existing mechanisms for authorizing exports by allowing permits to be issued in situations not currently covered but would not require a permit to be obtained in those instances where a permit currently is not required.

The bill would also amend the Act's prohibition section to resurrect language enacted in 1981 but changed by the 1994 amendments. The proposed change would close a potential loophole by clarifying that unauthorized transports, purchases, sales, or

exports of marine mammals or marine mammal parts constitute violations of the Act regardless of whether the underlying taking was legal.

**Permit-Related Amendments**—Three sections of the recommended bill address specific problems that have arisen with respect to the permit provisions of the Act. The 1994 amendments added a provision authorizing the issuance of permits for the importation of polar bear trophies from Canada. Currently, the Fish and Wildlife Service is required to publish in the *Federal Register* a notice of the receipt of the application for each such permit and a notice of issuance for each permit. Inasmuch as the only determination to be made is whether the trophy to be imported was legally taken in Canada before a certain date or from an approved population, and because few public comments on individual imports have been submitted, the proposed bill would have streamlined the permitting process by eliminating the publication requirements. In their place, and to ensure that the public continues to have access to information on these types of permits, the Service would be required to make available semiannually a summary of all such permits issued or denied. The Service would still be required to publish a notice of any application received seeking authority to import a polar bear trophy taken from a nonapproved population.

Another question that has arisen in the past several years is whether releasing captive marine mammals to the wild constitutes a taking that requires authorization under the Act. The Commission, the National Marine Fisheries Service, and others subscribe to the view that releasing marine mammals has the potential to injure the animals or wild populations exposed to the animals and, therefore, is a taking. This position was adopted by the presiding administrative law judge in a 1999 ruling in an enforcement proceeding brought by the National Marine Fisheries Service against individuals who had released two long-term captive dolphins without obtaining authorization. The Administration bill would codify this interpretation by adding an explicit prohibition on releasing captive marine mammals unless authorized by a permit or under section 109(h) of the Act, which authorizes the rehabilitation and release of stranded marine mammals. In response to concerns raised by the Navy that the marine mammals it maintains for military and research purposes might fit under this provision, the bill would exclude the temporary release of such animals.

The 1994 amendments to the Marine Mammal Protection Act eliminated most authority of the National Marine Fisheries Service and the Fish and Wildlife Service over captive marine mammals. One result of this shift in agency responsibilities was the invalidation of a long-standing National Marine Fisheries Service policy against issuing permits for traveling displays of dolphins or other cetaceans. This policy had been instituted because of the high stress levels and other risks posed by such exhibits on this group of animals. The Administration bill would reinstate the ban on traveling cetacean exhibits through an amendment to the Act's prohibition section.

**Fisheries Provisions**—The 1994 amendments to the Marine Mammal Protection Act established a new regime to govern the taking of marine mammals incidental to commercial fishing operations. This regime replaced an interim exemption for commercial fisheries that had been in place since 1988. The Administration bill would strike the outdated interim exemption provisions (section 114) and would modify the operative provisions of section 118. Most notably, the proposed amendments would expand coverage of the incidental take regime to include not only commercial fisheries but also recreational and subsistence fisheries that frequently or occasionally cause mortality or serious injury of marine mammals. Such a change is considered desirable because in some areas these fishermen use the same gear and fishing techniques as do commercial fishermen, and therefore are believed to have similar rates of interactions with marine mammals, yet are not subject to the requirements of the Act pertaining to monitoring, reporting, and take reduction.

Other amendments recommended in the Administration's bill would (1) clarify that it constitutes a violation of the Act to engage in a fishery that frequently or occasionally takes marine mammals (category I and II fisheries) without having registered, (2) clarify that owners of vessels engaged in category I and II fisheries are required to carry an observer when requested, whether or not they are registered, (3) consolidate all section 118 prohibitions into a single subparagraph to eliminate possible confusion, (4) eliminate the requirement to prepare a take reduction plan for a strategic stock if it is determined that fishery-related mortality and serious injury are having a negligible impact on that stock, and (5) require that California sea otters be factored into monitoring and observer placement decisions and that information re-

garding California sea otters be included in the annual List of Fisheries even though incidental taking of this species would not be authorized. The bill would also delete section 120(j) of the Act, which contains provisions applicable to the Gulf of Maine stock of harbor porpoises that are no longer needed.

Other changes recommended by the Administration would require the Secretary of Commerce to assign a technical liaison to each take reduction team and to reconvene the team to review proposed regulations implementing the take reduction plan and any proposed changes to the team's draft plan. In addition, new provisions would be added directing the Secretary to undertake and fund research directed at developing improved fishing methods and gear to reduce the taking of marine mammals incidental to fishing operations and to explore new technologies to improve the monitoring of marine mammal bycatch. The bill also contains technical amendments to correct and clarify the Act's tuna-dolphin provisions.

**Enforcement and Penalties**—The fines and other penalties that can be assessed for violations of the Marine Mammal Protection Act have not been increased since the Act was originally enacted in 1972. To account for inflation since that time and to enhance effective enforcement of the Act, the Administration proposed that the Act be amended to increase the maximum civil penalty from \$10,000 to \$50,000 for each violation. Maximum criminal fines would be increased from \$20,000 to \$100,000 per violation. Similarly, the maximum fine that could be assessed against a vessel for violating the Act would be increased from \$25,000 to \$50,000. A related amendment would authorize the seizure and forfeiture of a vessel's cargo (including fish) for fishing in violation of the provisions of section 118 of the Act.

The proposed amendments would add a new provision explicitly prohibiting various actions that frustrate implementation and enforcement of the Act. The bill would make it illegal to refuse a lawful vessel boarding, interfere with an authorized search or inspection, or submit false information in an investigation. An enhanced penalty of up to \$200,000 would be made available for offenses involving the use of a dangerous weapon, that cause bodily injury to enforcement officials, or that place enforcement officials in fear of imminent bodily injury.

The Administration bill also contains a provision that would direct the Secretary to seek cooperative enforcement agreements with state law enforcement

agencies. Another provision would authorize the National Marine Fisheries Service to use fines collected under the Act for the protection and recovery of marine mammals under its jurisdiction, something that the Fish and Wildlife Service currently is authorized to do.

**Marine Mammal Commission Administration**—The Marine Mammal Protection Act currently limits the amount that the Commission may compensate experts or consultants to \$100 per day. This limitation, in today's economy, prevents the Commission from securing the services of virtually all experts and consultants. The Administration bill would eliminate this restriction and place the Commission on an equal footing with other government agencies.

**Marine Mammal Health and Stranding Response**—Under the Administration bill, appropriations would be authorized to carry out Title IV of the Marine Mammal Protection Act for a five-year period. In addition, the bill would amend sections 402 (data collection), 403 (stranding response agreements), and 406 (indemnification) to specify that these provisions apply to disentanglement activities as well as to stranding responses. Another proposed amendment would allow general appropriations for implementing the Act to be placed in the unusual mortality event fund, whether or not earmarked for unusual mortality responses.

**Research Grants**—Section 110 of the Marine Mammal Protection Act authorizes the National Marine Fisheries Service and the Fish and Wildlife Service to make grants or otherwise fund research pertaining to the protection and conservation of marine mammals. That section identifies specific research projects to be undertaken, all of which should have been completed. Therefore, the Administration bill recommended that the provisions applicable to those projects be deleted and the section revised to facilitate research directed not only at specific marine mammal issues but at ecosystem-level problems. The proposed language identified studies of two such problems that should be given high priority—a Bering Sea–Chukchi Sea ecosystem study and a study of the California coastal marine ecosystem.

**Definition of Harassment**—Although harassment has been an element of the term “take” since the Marine Mammal Protection Act was enacted in 1972, a definition of harassment was not added to the Act until 1994. Under that definition, Level A harassment is any act of pursuit, torment, or annoyance that

has the potential to injure a marine mammal or marine mammal stock in the wild. Level B harassment is defined as any act of pursuit, torment, or annoyance that has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering. This definition has been subject to differing interpretations.

To eliminate the ambiguities in the current definition and to provide greater predictability, the Administration bill includes a proposed redefinition of harassment. Level A harassment would be redefined to mean any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild. Level B harassment would be redefined into two subelements. First, Level B harassment would include any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering to a point where such behavioral patterns are abandoned or significantly altered. Second, Level B harassment would include any act directed toward a specific individual, group, or stock of marine mammals in the wild that is likely to disturb the mammal or mammals by disrupting behavior, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering.

**Ship Strikes**—To underscore the plight of the North Atlantic right whale and the need to take additional steps to stem whale mortalities from ship strikes, the Administration bill would amend section 112 of the Act to require the Secretary of Commerce to use existing authorities under the Act to reduce the incidence of ship strikes of whales and to encourage further investigation of methods for avoiding ship strikes.

## Activities in 2004

Although no additional hearings on reauthorization were held by Congress during 2004, efforts to craft a reauthorization bill acceptable to diverse constituencies continued throughout much of the year. As part of this process, members of Congress and their staffs consulted with the Commission and other federal agencies concerning specific legislative propos-

als. The starting point for many of these discussions was the language in the proposed Administration bill and that set forth in H.R. 2693, a reauthorization bill that had been approved by the House Resources Committee in 2003. A summary of the provisions of H.R. 2693 was provided in the previous annual report and will not be repeated here.

During 2004 two additional bills that would have amended the Marine Mammal Protection Act were introduced. Representative Wayne T. Gilchrest, Chairman of the Subcommittee on Fisheries Conservation, Wildlife, and Oceans, introduced H.R. 4869 on 20 July 2004 to reauthorize and amend the provisions of the Act applicable to the John H. Prescott Marine Mammal Rescue Assistance Grant Program (section 408 of the Marine Mammal Protection Act). That bill also would have reauthorized funding for the Marine Mammal Unusual Mortality Event Fund under section 409 of the Act.

The second bill, H.R. 5104, introduced by Congressman Gilchrest on 17 September 2004, incorporated all of the provisions of H.R. 4869 but also would have amended several other sections of the Marine Mammal Protection Act. Many of the provisions of H.R. 5104 reflected proposals that had been included in H.R. 2693, but there were some significant differences. Unlike the earlier bill, H.R. 5104 included a provision to authorize harvest management agreements between the federal resource agencies and Alaska Native organizations that would allow the parties to establish enforceable harvest limits before a stock is designated as depleted. Although similar to the harvest management provision in the Administration bill, which relied on existing tribal authorities, the provision in the House bill would have provided explicit statutory authority for Alaska Native organizations to implement and enforce harvest limits on all Native subsistence taking covered by a co-management agreement. In addition, H.R. 5104 dropped the proposed redefinition of the term “harassment” that had been included in H.R. 2693, and that had proved to be the most controversial proposal in the earlier bill. This was due in part to the enactment in November 2003 of a new harassment definition for military readiness activities and scientific research on marine mammals conducted by or on behalf of the federal government as part of the National Defense Authorization Act for Fiscal Year 2004 (Pub. L. 108-136) and to the desire to enhance the prospects for passage of H.R. 5104 by the House of Representatives

during the 2004 session. H.R. 5104 omitted amendments to extend the general authorizations for funding to implement the Act but included specific authorizations for the Prescott grant program, the Marine Mammal Unusual Mortality Event Fund, carrying out and funding research on the nonlethal removal and control of nuisance pinnipeds, developing improved fishing methods and gear, conducting and funding research related to the protection and conservation of marine mammals and the ecosystems on which they depend, and the development and implementation of cooperative agreements with Alaska Native organizations to conserve and manage marine mammal stocks taken for subsistence. Other provisions of H.R. 5104 would have:

- amended the Act's import provision [section 101(a)(6)] to clarify that exports of marine mammal products as part of cultural exchanges by Alaska Natives and Native inhabitants of Russia, Canada, and Greenland, or for noncommercial purposes by a U.S. citizen in conjunction with travel abroad or by a non-citizen who legally possesses the product are authorized as well as imports.
- expanded 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
- increased the time for preparing and reviewing take reduction plans under section 118(f) of the Act and eliminated 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
- retained the zero mortality rate goal of the incidental take regime for commercial fisheries but eliminated the requirement that it be achieved within seven years of enactment of the 1994 Marine Mammal Protection Act amendments
- required that stock assessment reports and take reduction plans reflect the conservation benefits derived from state and regional fishery management actions
- required increased representation of National Marine Fisheries Service employees at take reduction team meetings
- required the Service to consult with a take reduction team before publishing any take reduction plan that differs from that recommended by the team
- directed the Secretary of Commerce to conduct research on measures for the nonlethal removal and control of nuisance pinnipeds

- eliminated 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
- extended the exemption for scrimshaw products and materials under the Endangered Species Act for an additional eight years
- specifically prohibited the release of a captive marine mammal without prior approval
- amended 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
- excluded marine mammals exported to foreign facilities from the inventory of marine mammals maintained in captivity and specified that the inventory be updated annually
- directed the National Marine Fisheries Service and the Fish and Wildlife Service to conduct a review of and report on the costs and benefits of maintaining the inventory of marine mammals maintained in captivity
- increased the maximum penalties for violations of the Act
- reinstated 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 created an annual reporting requirement for federal agencies that conduct or fund marine mammal research

H.R. 5104 was considered by the House Resources Committee on 22 September 2004, which ordered that the bill be favorably reported to the House of Representatives with no amendments. Further discussion of the bill can be found in House Report 108-787, published on 19 November 2004. No further action was taken on the bill during the 2004 session of Congress.

### **Marine Mammal Protection Act Related Amendment**

As discussed in the previous annual report, two sets of amendments to the Marine Mammal Protection Act were enacted in 2003. Amendments enacted as part of the National Defense Authorization Act for Fiscal Year 2004 altered the definition of the term harassment for military readiness activities and ma-

rine mammal research conducted by or on behalf of federal agencies. Those amendments also established a process for exempting certain national defense activities from the requirements of the Marine Mammal Protection Act and eliminated the “small numbers” and the “specific geographic region” requirements otherwise applicable to small-take authorizations issued under section 101(a)(5) of the Act for military readiness activities. The other amendments, enacted as part of the Department of the Interior’s 2004 appropriations legislation, extended the grandfather provision applicable to polar bear trophies from the date of enactment of the 1994 amendments (30 April 1994) to the date that the Fish and Wildlife Service published its implementing regulations (18 February 1997). No similar amendments of the Marine Mammal Protection Act were enacted in 2004. However, one amendment related to the Act was enacted as part of the Consolidated Appropriations Act, 2005, signed into law as Public Law 108-447 on 8 December 2004.

As discussed in Chapter II, the district court in Hawaii ruled that a seasonal ban on parasailing activities in areas frequented by humpback whales was precluded by section 109(a) of the Marine Mammal Protection Act, which preempts state laws and regulations related to the taking of marine mammals, and

by a freestanding provision enacted as part of the Marine Mammal Protection Act Amendments of 1994, which specifies that it is lawful to approach, by means other than aircraft, to within 100 yards of a humpback whale in waters surrounding the State of Hawaii. Although an appeal of the case by the State of Hawaii was pending, Congress stepped in to resolve the issue. Section 213 of Public Law 108-447 specifies that, notwithstanding any other federal law related to the conservation and management of marine mammals, the State of Hawaii may enforce laws or regulations with respect to the operation in state waters of recreational and commercial vessels for the purpose of conserving and managing humpback whales, provided that the state law is no less restrictive than applicable federal law. The legislative history that accompanied this provision contradicted the court’s resolution of the apparent conflict between the Marine Mammal Protection Act’s preemption provision and section 6 of the Endangered Species Act, which authorizes states to adopt more restrictive laws pertaining to the taking of endangered and threatened species. Congress sought to clarify that states may adopt more protective laws for all listed species, including listed marine mammals, notwithstanding the Marine Mammal Protection Act preemption provision.



## Chapter VIII

### RESEARCH AND STUDIES PROGRAM

The Marine Mammal Protection Act requires that the Marine Mammal Commission maintain a continuing review of research programs conducted or proposed under authority of the Act; undertake or cause to be undertaken such other studies as it deems necessary or desirable in connection with marine mammal conservation and protection; and take every step feasible to prevent wasteful duplication of research. To accomplish these tasks, the Commission convenes meetings and workshops to review, plan, and coordinate marine mammal research; contracts for studies to help identify and develop solutions to domestic and international problems affecting marine mammals and their habitats so as to facilitate and complement activities of other agencies; and recommends steps that should be taken to prevent unnecessary duplication and enhance the quality of research conducted or supported by the National Marine Fisheries Service, the Fish and Wildlife Service, the Geological Survey, and other federal agencies.

#### Workshops and Planning Meetings

In 2004 the Marine Mammal Commission provided comments and recommendations by letter to other federal agencies on a broad range of issues affecting the conservation and protection of marine mammals and marine mammal habitats. The issues included protection and recovery of endangered, threatened, and depleted species; interactions between marine mammals and fisheries; the possible direct and indirect effects of coastal and offshore development on marine mammals and their habitat; people swimming with and otherwise directly interacting with cetaceans; response to marine mammal strandings and unusual mortality events; applications for scientific research permits; and requests for authorization to

take small numbers of marine mammals incidental to a variety of industrial, military, and scientific activities. Copies of many of the letters may be viewed at the Commission's Web site ([www.mmc.gov](http://www.mmc.gov)).

In 2004 members of the Commission, its Committee of Scientific Advisors, and its staff helped organize or participated in meetings and workshops to accomplish the following:

- direct the federal Advisory Committee on Acoustic Impacts on Marine Mammals (see Chapter IV)
- evaluate beaked whale (Family Ziphiidae) sensitivity and response to anthropogenic sound in the ocean
- consider effects of shipping on sound in the ocean and marine mammals
- develop international policy on sound and marine mammals
- participate in interagency fora discussing U.S. policy on oceans and marine resources
- evaluate and improve methods for analyzing the potential of proposed actions to cause "jeopardy" under the Endangered Species Act
- provide testimony at a legal hearing regarding the status of Cook Inlet beluga whales (*Delphinapterus leucas*)
- assist the International Whaling Commission in developing a framework for assessment of cetacean habitat and addressing other scientific issues related to cetaceans
- participate in the International Whaling Commission's mini-symposium on acoustics
- promote collaboration between the United States and Russia with regard to marine mammal research
- review and improve assessments of marine mammal stocks
- develop a research plan for western Alaska sea otters (*Enhydra lutris*)

- review research funded by the settlement from the *Exxon Valdez* oil spill
- develop take reduction plans for Atlantic bottlenose dolphins (*Tursiops truncatus*) and North Atlantic right whales (*Eubalaena glacialis*)
- discuss a conservation plan for the AT1 group of killer whales (*Orcinus orca*) in Prince William Sound, Alaska
- develop recovery plans for Steller sea lions (*Eumetopias jubatus*), Hawaiian monk seals (*Monachus schauinslandi*), and North Atlantic right whales
- identify actions needed to implement recovery plans for North Atlantic right whales, Hawaiian monk seals, and Florida manatees (*Trichechus manatus*)
- evaluate the current status and conservation issues facing vaquita (*Phocoena sinus*)
- evaluate false killer whale (*Pseudorca crassidens*) populations and fishery interactions in the central Pacific Ocean
- discuss ways to separate conservation and allocation decisions in fisheries management
- discuss and suggest improved methods to evaluate cetacean systematics
- guide management of the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve, including fishery management, a regional science plan, and the possible transition to a national marine sanctuary through the Reserve Advisory Committee
- participate in necropsies for dolphins stranded in and around Puget Sound

## 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 contracts for research and studies to help identify and determine how best to minimize threats to marine mammals and their habitats. Since it was established in 1972, the Commission has contracted for more than 1,000 projects ranging in amounts from several hundred dollars to \$150,000. Final reports of most Commission-sponsored studies are available from the National Technical Information Service or directly from the Commission.

In 2004 the Commission announced a call for pre-proposals for projects aimed at furthering the conservation and management goals of the Marine

Mammal Protection Act. In response, the Commission received 128 pre-proposals. Based on initial review by a subcommittee of the Commissioners and its Committee of Scientific Advisors, the Commission solicited full proposals for 47 of the suggested projects. After final review, the following studies were funded.

### Stock Identification and Assessment

**Aerial and Boat Survey of Hawaiian Monk Seals in the Main Hawaiian Islands (National Marine Fisheries Service, Pacific Islands Fisheries Science Center, Honolulu, Hawaii)**—The population of Hawaiian monk seals in the main Hawaiian Islands appears to be increasing. Although most Northwestern Hawaiian Islands monk seal populations are declining, the main Hawaiian Islands appear to represent the area with the most potential for population expansion, thus buffering extinction risk. Based upon aerial surveys conducted in 2000–2001, more than 60 percent of the main Hawaiian Islands monk seals occur on the island of Niihau and nearby Lehua Rock. The Marine Mammal Commission provided funds to assist in the estimation of abundance trends and pup production at these sites, specifically providing support for aerial and boat surveys in 2005. A summary of survey results, including a GIS database of seal locations, is expected to be available early in 2006.

**Isolation of Hawaiian Monk Seal Microsatellites (University of Hawaii, Kaneohe, Hawaii)**—Effective management of the Hawaiian monk seal requires accurate stock assessment. Although several studies have attempted to elucidate the stock structure of Hawaiian monk seals throughout the Northwestern Hawaiian Islands using molecular analyses, the results were inconclusive due to a lack of highly variable markers and low sample size. Furthermore, no genetic analysis has ever been performed on seals inhabiting the main Hawaiian Islands, and their relationship to seals inhabiting the Northwestern Hawaiian Islands is largely unknown. The Marine Mammal Commission provided funds for research to document the population structure of the Hawaiian monk seal throughout its range and compare directly the two populations. The researchers will develop at least four to six hypervariable microsatellite loci, designed specifically for the Hawaiian monk seal. All results will be shared with the Marine Mammal Research Program at the National Marine Fisheries Service's Pacific Islands Fisheries Science Center. Conclusions

regarding stock structure and effective population size will be incorporated into the Service's stock assessment report and used to guide subsequent management. The genetic primers will be published in *Molecular Ecology Notes* and submitted to the National Center for Biotechnology Information public domain database (GenBank), where they will be available for use in future studies. Research results also will be presented at the 16th Biennial Conference on the Biology of Marine Mammals late in 2005 and will be submitted for publication in academic journals at the end of 2006.

**Genetic Age Determination in Baleen Whales (University of California, Berkeley)**—Accurate age data for living whales has long eluded whale ecologists, even though significant knowledge has been gained concerning other population parameters through field and genetic studies. The Marine Mammal Commission has provided funding for research to develop a genetic method of age determination for baleen whales using DNA extracted from skin biopsies. The researchers intend to predict age by assessing the relative amount of telomeric DNA, which is known to decrease throughout the life span of other vertebrates. The method will be verified using humpback whales (*Megaptera novaeangliae*) and southern right whales (*Eumetopias australis*) of known age. The method will then be applied to a large number of samples of unknown age, providing age data to augment the long-term study of the two species. This project will require two years of research. The results of the analysis will be submitted for publication in academic journals in 2007.

**Cook Inlet Beluga Whale Assessment: Surfacing Interval Tagging Project (National Marine Fisheries Service, National Marine Mammal Laboratory, Seattle, Washington)**—The Cook Inlet beluga whale population was reduced severely by subsistence harvesting prior to 1998. The population has failed to recover despite a substantial reduction in the harvest by Native subsistence hunters. Assessment of this population is based primarily on aerial surveys. The Marine Mammal Commission provided funding to improve the estimation of a correction factor for the proportion of beluga whales that are submerged, and therefore not counted, during aerial surveys. The current correction for surveys of Cook Inlet beluga whales is based on a total of 15 hours of data collected from four animals from one location in 1994–1995. Commission funding will support the

collection of additional data during the June 2005 beluga survey. The results of this study will be used to improve abundance estimates for Cook Inlet beluga whales and will be submitted for publication in an academic journal in 2006.

**Ecology, Status, and Stock Identity of Beluga Whales, *Delphinapterus leucas*, in Yakutat Bay, Alaska (National Marine Fisheries Service, Southwest Fisheries Science Center, La Jolla, California)**—Beluga whales have been seen each spring since 2002 in Yakutat Bay on the Gulf of Alaska's outer coast. The numbers observed have been small (fewer than 10), and their occurrence in a glacial fjord is unusual for this species in the Western Hemisphere. The location of this group, and its close proximity to actively calving glaciers, challenges accepted views on the ecology, distribution, and stock structure of beluga whales in Alaska and warrants investigation. The Marine Mammal Commission provided funds to support research focused on understanding the stock structure, abundance, distribution, and local ecology of these beluga whales. Field studies will focus on collecting skin and blubber samples from free-swimming whales and on aerial surveys, boat, and shore-based observations, and photo-identification of individual whales. Molecular genetic analyses will be conducted to resolve stock structure, determine kinship, measure genetic diversity, and estimate abundance using genetic mark/recapture methods. The project will require three years of research, and results will be submitted for publication in academic journals in 2008.

**Photogrammetric Analysis of Killer Whales from Antarctica (National Marine Fisheries Service, Southwest Fisheries Science Center, La Jolla, California)**—Three distinct forms of killer whales were recently described from Antarctica and may represent separate species. In addition to the typical Antarctic form, one, or possibly two, "dwarf" forms of killer whales may coexist in these waters. Given their large numbers (current estimates are 25,000–94,000), killer whales undoubtedly play an important ecological role in the Antarctic ecosystem. Understanding of that role will be facilitated by clarifying their taxonomic status. Conservation of killer whales, particularly in light of proposed commercial fishing operations in Antarctica, also will be facilitated by clarifying their taxonomic status, investigating their dietary needs, and assessing the potential impacts of fisheries on them. To facilitate a taxonomic evaluation of these

killer whale forms, the Marine Mammal Commission provided funds to purchase photographic equipment needed to collect aerial photogrammetric data on killer whales in the Ross Sea. Photogrammetric analyses should reveal any significant differences in morphometrics among these sympatric forms of killer whales and assist in the determination of potential species-level differences. The photographic equipment will be used in surveys conducted in 2004–2006, and results of that research will be submitted for publication in academic journals in 2007.

**Morphological Identification of Beaked Whales (Smithsonian Institution, Washington, D.C.)**—Beaked whales (Family Ziphiidae) compose nearly 25 percent of all cetacean species. Nonetheless, they are poorly understood and difficult to identify because the species have many morphological similarities. Accurate species identifications are imperative for developing conservation and management strategies, as well as for understanding the overall biology of individual species. No comprehensive reference exists for making rapid, positive identifications of stranded ziphiid species. The Marine Mammal Commission provided funds for the development of a Web site as a guide for accurately identifying stranded beaked whales based on morphological characters. This Web site will function as a centralized resource for species information, including specimen data files, images, and bibliographic references. Key diagnostic characters will be emphasized and downloadable files will be made available to stranding responders for use in the field. The site will be completed and available for public access at the end of 2005.

**Sirenian Symposium/Workshop (Perry Institute for Marine Science, Jupiter, Florida)**—The Ninth International Mammalogical Congress will meet 31 July–5 August in Sapporo, Japan. In association with this meeting, the IUCN Species Survival Commission's Sirenian Specialist Group has scheduled a symposium/workshop to finalize evaluations of the conservation status of sirenian species, subspecies, and selected populations or stocks. If this process is not completed by 2006, the official IUCN Red List classifications for sirenians (currently "vulnerable" for all species and subspecies) will be annotated as out-of-date. Such a classification would not only misrepresent current knowledge of the sirenians, it could have significant negative consequences for them if it diminishes conservation/research activity or the sense of urgency for conservation action by dif-

ferent governments or agencies. The Marine Mammal Commission provided funding to support travel costs for members of the Sirenian Specialist Group to attend the workshop. The Sirenian Specialist Group will develop revised formal assessments of the Red List status of each sirenian species and subspecies. They will also develop similar recommendations for individual stocks that appear to be particularly vulnerable. Those recommendations and their supporting documentation will be submitted to the IUCN in autumn 2005 for inclusion in the 2006 Red List of Threatened Species and the IUCN's Global Mammal Assessment.

### **Conservation and Recovery**

**Preventing Collisions between Ships and North Atlantic Right Whales: Choosing Stimuli for Controlled Exposure Experiments (Florida State University, Tallahassee)**—The failure of the North Atlantic right whale to recover is due primarily to human-caused mortality from ship strikes and entanglement in fishing gear. Ship strikes account for about 35 percent of all known mortalities even though the evidence suggests that right whales can hear approaching ships and can localize their own social sounds. Mitigation strategies have been developed to locate whales, to notify ships of whale locations, and to redirect vessel traffic. To date those strategies have not been sufficient to prevent ship strikes. One proposed method of preventing collisions is to project an auditory warning from the bow of vessels. Recent controlled exposure experiments suggest that whales respond to an "alarm signal," but it was not clear whether that response would reduce the vulnerability of whales to a ship strike. More exposure experiments are planned for 2005–2006. To ensure the utility of these experiments, the Commission provided funds to convene a workshop of experts on controlled exposure experiments, alarm signal design, and right whale biology and acoustics, as well as federal agency representatives familiar with the scientific and management issues related to North Atlantic right whales. The workshop focused on developing an appropriate exposure experiment protocol that would adequately test either the horizontal response of whales (i.e., do whales at the surface move away from an alarm signal?) or the possibility that whales could habituate to the alarm signal and thus stop responding to the signal over time. Results from this workshop were presented at a meeting of the Right Whale Consortium in No-

vember 2004 and will be used to guide experiments in the summer of 2005.

**Prioritization of Cetacean Bycatch Problems Worldwide: Disseminating the Results to Decision Makers and Aid Agencies in the United States and Elsewhere (World Wildlife Fund, Washington, D.C.)**—Worldwide, bycatch in fisheries is the most pressing threat to cetaceans, killing an estimated 300,000 animals each year. Nonetheless, data needed to mitigate bycatch are limited, especially in developing nations. The Marine Mammal Commission funded the World Wildlife Fund to classify and rank cetacean bycatch problems to guide funding and intervention. Criteria to be used for this purpose will include conservation status, vulnerability factors, degree of threat from bycatch, feasibility of intervention, and existing mitigation efforts. The establishment of priorities should facilitate reduction in marine mammal bycatch, improve regulation and enforcement of the fisheries responsible, and increase technical and financial support to help countries address bycatch problems. The World Wildlife Fund will disseminate the results to relevant policy and aid bodies, the media, and academic institutions within the United States and beyond. The results will be disseminated in several forms tailored to various audiences and translated into other languages (including French, Spanish, Chinese, and Japanese). The Fund also will arrange a series of workshops and other interactive forums in 2005 for sharing prioritization results with government officials, representatives of aid agencies and other donor organizations, partner non-governmental organizations, the media, and others in the United States and elsewhere.

**The Effects of Declining Freshwater Supplies on Ganges River Dolphins and Irrawaddy Dolphins in the Sundarbans Delta of Bangladesh (Wildlife Conservation Society, Asian Freshwater and Coastal Cetacean Program, Phuket, Thailand)**—Declining freshwater supplies in the Ganges-Brahmaputra-Meghna river system may have profound effects on the habitat of the critically endangered Ganges River dolphin (*Platanista gangetica gangetica*) and the Irrawaddy dolphin (*Orcaella brevirostris*) in the Sundarbans Delta of Bangladesh. This situation will undoubtedly worsen if India proceeds with the planned construction of a \$120–\$200 billion interbasin water transfer project, which will involve large-scale dam construction and diversion of water from rivers inhabited by the dolphins. The Ma-

rine Mammal Commission provided funding for the development of an ecological model of the effects of declining freshwater supplies based on existing data on environmental variables related to freshwater flow and interseasonal differences in dolphin distribution patterns. As part of the project, researchers will visit Bangladesh to (1) strengthen an ongoing dolphin monitoring program, (2) obtain additional hydrological data from the Bangladesh Surface Water Modeling Centre, and (3) conduct targeted survey work in areas of the Sundarbans where the distributions of the two dolphin species overlap. The results of this study will be provided to water development authorities and international financial agencies involved with water development planning in 2005 and will be submitted for publication in an international conservation or development journal in 2006.

**Assessment of Thermal Heating Requirements for Nonindustry-Dependent Warm-Water Refuges for Florida Manatees (University of Central Florida, Florida Solar Energy Center, Cocoa, Florida)**—Cold stress is a significant source of mortality for Florida manatees. In general, such deaths occur when animals are exposed for long periods of time to temperatures colder than about 22 °C. To survive such cold periods, most animals retreat to refuges (usually natural springs or power plant outfalls) that discharge warm water. Currently a vast majority of manatees along Florida's Atlantic coast thermoregulate during winter months by moving to sites warmed by discharge from five power plants built before the early 1970s. Many of these plants are reaching the end of their planned operational life. Regulations governing thermal discharges now preclude the approval of comparable thermal discharges from new plants. Thus, if these older plants are closed, the Atlantic coast subpopulation of Florida manatees could incur significant winter mortality due to cold stress.

Preliminary modeling studies have been used to assess the feasibility of providing warm-water refuges using solar energy. In 2004 the Marine Mammal Commission provided funds for an additional feasibility study and cost-effectiveness analysis using more precise heat flux models. A draft report was provided to the Commission and a final report will be made available to the public early in 2005.

## Ecology and Ecosystem Management

**The Impacts of Climate Change on Arctic Marine Mammals (Henry P. Huntington, Ph.D.,**

**Eagle River, Alaska)**—Climate change has produced dramatic effects on air temperature, sea ice, and other aspects of the Arctic marine environment. The Arctic Climate Impact Assessment report, published in November 2004, identifies plausible climate scenarios and assesses likely impacts to marine systems. The implications of those impacts may be severe for Arctic marine mammals and the native cultures that hunt them. Nonetheless, those impacts and potential mitigation measures have received relatively little attention. The Marine Mammal Commission provided funds to support a scientific summary of the likely effects of climate change on Arctic marine mammals, together with an assessment of potential conservation strategies to respond to those effects. The results of this synthesis will be compiled into a special publication of a scientific journal, which will be submitted for publication at the end of 2005. A separate, brief manuscript summarizing the key findings will be submitted for publication in a scientific journal.

**Baleen Whales as Prey for Killer Whales (*Orcinus orca*) in the High-Latitude North Pacific and Elsewhere (Boston University Marine**

**Program, Marine Biological Laboratory, Woods Hole, Massachusetts)**—It has been hypothesized that large-scale removal of baleen whales by whaling in the high-latitude North Pacific Ocean forced killer whales to change their target prey, causing sequential declines in pinniped and sea otter populations. This hypothesis has considerable scientific and management implications and has been highly controversial. The Marine Mammal Commission provided funds for the completion and publication of a study examining indirect evidence of killer whale attacks (scars) using long-term photographic databases of several mysticete species. The frequency and timing of acquisition of scars from killer whales may indicate where and how often baleen whales are attacked and which age classes are targeted. The study also will use museum specimens of potential predators to test the assumption that the rake-type scars observed on large whales indeed originate from killer whales. Two manuscripts will be submitted for publication in academic journals in 2005, one focused on the importance of baleen whales as prey for killer whales and the other focused on the origin of rake scars on mysticete whales.

## 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. Amendments enacted in 1994 provide for the issuance of permits to authorize the taking of marine mammals in the course of educational or commercial photography and for importing polar bear trophies from certain populations in Canada. With the exception of those for the importation of polar bear trophies, the Marine Mammal Commission is 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 fisheries. Such authorizations can be issued only if the Service determines that the taking will have a negligible impact on the affected stocks and if other statutory requirements pertaining to the scope of the activity, monitoring and reporting, and so forth are met.

This chapter discusses the Commission’s review of permit applications and authorization requests received in 2004.

### Permit Application Review

Permits for scientific research, public display, species enhancement, and photography all involve the same four-stage review process: (1) either the National Marine Fisheries Service or the Fish and Wildlife Service receives and initially reviews applications from private citizens 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, formulates and transmits its recommendation to the Service, and (4) final action is taken by the Service after consideration of comments and recommendations by the Commission, other expert reviewers, and the public. If captive maintenance of animals is involved, the Service seeks the views of the Animal and Plant Health Inspection Service on the adequacy of facilities, animal husbandry and care programs, and transportation arrangements. When proposed activities (e.g., scientific research) include marine mammal species under both agencies’ jurisdiction, the Services have developed guidelines to streamline the permitting process through a joint application and the issuance of a single permit.

Once a permit is issued, the permit holder or the responsible agency can amend it, provided the proposed change meets statutory and regulatory requirements. Depending on the extent of the proposed change, an amendment may be subject to the same notice, review, and comment procedures as the original

permit application. The Commission reviews amendments to permits, except those amendments considered to be of a minor nature (i.e., those that do not include a request to take additional numbers or species of animals, expand the type of taking authorized, increase the risk of adverse impact, or change or expand the location of the research). Under the National Marine Fisheries Service's permit regulations, an extension of the duration of research up to 12 months for activities that were included in the original scope of the permit is considered to be a minor amendment.

As discussed in the Commission's previous annual report, the marine mammal research community has become increasingly concerned about the recent trends in the time required to obtain scientific research permits. Based on the information presented at the Commission's 2003 annual meeting, it appears that one cause of such delays is insufficient staffing to handle the workload, both in the National Marine Fisheries Service's Office of Protected Resources and the Fish and Wildlife Service's Division of Management Authority. In some cases, delays stem not from the requirements of the Marine Mammal Protection Act but from additional reviews and procedures necessitated by the National Environmental Policy Act and the Endangered Species Act (e.g., preparation of an environmental impact statement or assessment or a section 7 consultation). Compliance with these requirements can be time-consuming and add to the burden placed on already understaffed programs. In response to this and other problems, Congress established a \$10 million "marine mammal initiative" under the appropriations legislation enacted for fiscal year 2005 and specified that \$1 million was to be used to hire additional staff for the "permitting functions" of the National Marine Fisheries Service's Office of Protected Resources. Furthermore, the report accompanying that legislation indicated that Congress expects the agency to request funding for these additional positions in its budget submission for fiscal year 2006.

The National Marine Fisheries Service is also exploring ways to streamline and better coordinate the required reviews. For example, the Service is undertaking programmatic environmental reviews to assess the impacts of research on specific species or groups of animals or the effects of certain research techniques. The Service completed a combined environmental assessment on several research projects that were part of a comprehensive field study of hump-

back whales (*Megaptera novaeangliae*) throughout the North Pacific (the SPLASH study; see Chapter II). The Service is also preparing an assessment on the effects of issuing a group of permits to authorize aerial surveys of right whales (*Eubalaena glacialis*) in the North Atlantic as part of the northeastern right whale early warning system and sighting advisory system. The objective is to provide real-time information on the locations of whales so that the incidence of ship strikes can be reduced. In addition, the Service is in the planning stages of preparing an environmental impact statement (EIS) on the effects of issuing future permits for right whale research in general. The Service intends to publish a notice of intent in the *Federal Register* to prepare the programmatic right whale EIS and will alert the right whale research community and other interested parties in advance of the *Federal Register* notice. Whether the EIS will include right whales in the North Pacific, in addition to the North Atlantic, may be an issue for the scoping process. In the meantime, however, the Service is deferring decisions on permits for intrusive research on right whales until completion of the EIS, a situation that is cause for concern among many researchers.

During 2004 the Commission reviewed 28 permit applications submitted to the National Marine Fisheries Service and 9 permit applications submitted to the Fish and Wildlife Service. Of the applications received by the National Marine Fisheries Service, 23 were for scientific research, 1 was for commercial/educational photography, and 4 were for public display. Of the applications received by the Fish and Wildlife Service, 6 were for scientific research, 2 were for public display, and one was for species enhancement. In addition, the Commission reviewed 14 permit amendment requests submitted to the Services (12 to the National Marine Fisheries Service and 2 to the Fish and Wildlife Service). The Commission also reviewed three requests for authorizations to obtain marine mammals under the Defense Authorization Act of 1986 (10 U.S.C. § 7524) from the National Marine Fisheries Service. The Commission reviewed one request received by the Fish and Wildlife Service for authorization to proceed with permitted research.

In general, the Services adopted the Commission's recommendations concerning these permit requests.

Amendments to the Marine Mammal Protection Act enacted in 1994 allow the Secretary of the Interior to issue permits authorizing the importation of

sport-hunted polar bear trophies from 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 6 of 14 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. The Service is currently reviewing information to determine whether the Gulf of Boothia polar bear population should be added to the list of approved populations.

Under regulations promulgated by the Fish and Wildlife Service, a \$1,000 fee is assessed for each polar bear permit issued, with revenues to be used for the development and implementation of cooperative research and management programs for the conservation of polar bear populations in Alaska and Russia. Although the Commission comments to the Service as to whether a polar bear management unit meets the criteria to qualify as an approved population, 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 700 import permits have been issued. Of these, 132 were issued in 1997, 60 in 1998, 142 in 1999, 76 in 2000, 71 in 2001, 48 in 2002, 68 in 2003, and 110 in 2004.

### General Authorizations

Between 6 and 16 researchers a year have obtained letters from the National Marine Fisheries Service and the Fish and Wildlife Service confirming that their activities may appropriately be conducted under a streamlined procedure established by the 1994 amendments to the Marine Mammal Protection Act. The amendment requires that the Services use this “general authorization” for research that involves taking only by Level B harassment (i.e., any act of pursuit, torment, or annoyance that has the potential to disturb but not injure a marine mammal or marine mammal stock). During 2004, 16 letters of confirma-

tion were issued under the general authorization by the National Marine Fisheries Service. For certain types of research, this streamlined process has shortened the time needed to secure authorization. However, a general authorization is not available for activities that involve the taking of endangered or threatened marine mammals.

### Small-Take Authorizations

Under section 101(a)(5) of the Marine Mammal Protection Act, U.S. citizens may be authorized by the Secretaries of the Interior and Commerce to unintentionally take small numbers of marine mammals incidental to activities other than commercial fishing when they meet certain conditions. Congress added this provision to the Act in 1981 to provide a streamlined alternative to the otherwise applicable requirement to obtain a waiver of the Act’s moratorium on taking marine mammals. Applicants can use the provision when the number of animals likely to be affected is “small” and the impact on the size and productivity of the affected species or populations is likely to be negligible. Congress amended this section of the Act in 1986 to allow the taking of small numbers of depleted, as well as nondepleted, species and populations. All forms of incidental taking, including lethal taking, may be authorized under section 101(a)(5)(A). Congress also added a new subparagraph, section 101(a)(5)(D), to the Act in 1994 to streamline small-take authorizations further if the taking will be by harassment only. Further amendments enacted in 2003 revised these requirements for “military readiness activities” by, among other things, eliminating the small numbers limitation and requiring the Secretaries to consider “personal safety, practicality of implementation, and impact on the effectiveness of the . . . activity” when considering possible mitigation measures.

Authorizations under section 101(a)(5)(A) require the promulgation of regulations setting forth permissible methods of taking and requirements for monitoring and reporting, as well as a finding that the incidental taking will have negligible effects on the size and productivity of the affected species or stocks. Authorization of taking by 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 up to five years. The Secretary may issue authorizations under section 101(a)(5)(D) for up to one year. Both types of authorizations may be renewed.

Requests for small-take authorizations under sections 101(a)(5)(A) and 101(a)(5)(D) that the Commission provided comments on during 2004 are described in the following section.

### **Regulations under Section 101(a)(5)(A)**

**BP Exploration**—On 23 September 2004 the National Marine Fisheries Service published a notice in the *Federal Register* concerning a request from BP Exploration seeking authorization to take small numbers of bowhead whales (*Balaena mysticetus*), gray whales (*Eschrichtius robustus*), beluga whales (*Delphinapterus leucas*), ringed seals (*Pusa hispida*), spotted seals (*Phoca largha*), and bearded seals (*Erignathus barbatus*) incidental to oil production operations at the Northstar oil and gas facility in Alaska and federal waters. The Service indicated that it was considering whether to propose new regulations to authorize the taking of these marine mammals incidental to the planned operations and invited comments, information, and suggestions to assist it in developing proposed regulations.

The Commission, in consultation with its Committee of Scientific Advisors, provided comments to the Service on 30 December 2004. The Commission recommended that the Service initiate the proposed rulemaking, provided that it is satisfied that (1) the planned marine mammal and related monitoring programs will be adequate to verify how and over what distances marine mammals may be affected, (2) only small numbers of marine mammals will be taken, and (3) the cumulative impact of the proposed activities on the affected species and stock will be negligible. The Commission noted that available studies suggest that the effects of the construction and operation of the Northstar production facilities and related activities on marine mammals are “subtle and equivocal, and small in the context of natural variation of the

marine ecosystem.” The Commission believed this assessment to be encouraging but recommended nevertheless that a rigorous monitoring program sufficient to detect any nonnegligible effects be pursued to ensure that the activities are not individually or cumulatively having any population-level effects on marine mammals and are not adversely affecting the availability of marine mammals for subsistence uses by Alaska Natives. The Commission noted that the Service plans to convene a two-day peer-review and stakeholder meeting with the representatives of BP Exploration, the Minerals Management Service, the Alaska Eskimo Whaling Commission, and the North Slope Borough to discuss the mitigation and monitoring plan proposed by BP in its application and the concerns raised by the Inupiat communities about the potential impacts of the proposed activities on subsistence uses of marine resources.

A proposed rule to authorize the requested taking was under development by the Service at the end of 2004.

**Alaska Aerospace Development Corporation**—On 29 October 2004 the National Marine Fisheries Service published a proposed rule in the *Federal Register* that would authorize the Alaska Aerospace Development Corporation to take, by incidental harassment, small numbers of Steller sea lions (*Eumetopias jubatus*) during rocket launches and associated activities from the Kodiak Launch Complex on Kodiak Island, Alaska. Even though the applicant could have sought an incidental harassment authorization for its activities, it preferred to request a single authorization to cover taking for five years of launch-related operations.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the *Federal Register* notice and the applicant’s petition for regulations and provided comments to the Service on 30 December 2004. The Commission recommended issuance of the proposed regulations subject to the mitigation, monitoring, and reporting requirements described in the proposed rule. The Commission noted, however, that there is a possibility of taking of several marine mammal species in addition to Steller sea lions and recommended that authorization for the taking of those species be provided. The Commission also recommended that the applicant contact the Fish and Wildlife Service to determine if authorization for the incidental taking of small numbers of sea otters (*Enhydra lutris*) is needed. The Commission further

recommended that the proposed monitoring program be expanded to determine the effects of the activity on harbor seals (*Phoca vitulina*), sea otters, and other marine mammal species to determine if authorizations for these species are needed or, if authorization to take these species is provided, to verify that the impact on the affected stocks is negligible.

Completion of a final rule was pending at the end of 2004.

### **Incidental Harassment Authorizations under Section 101(a)(5)(D)**

**U.S. Army Corps of Engineers—Jacksonville District**—During 2004 the U.S. Army Corps of Engineers—Jacksonville District applied to the National Marine Fisheries Service for three incidental harassment authorizations for the taking of small numbers of marine mammals during blasting and dredging projects in Florida and Georgia. They are as follows:

**Brunswick Harbor, Glynn County, Georgia**—On 15 January 2004 the National Marine Fisheries Service published a notice in the *Federal Register* seeking comments on a request from the Army Corps of Engineers to take by harassment small numbers of bottlenose dolphins incidental to dredging and blasting activities relating to deepening the inner harbor portion of the Brunswick Harbor in Glynn County, Georgia. The Service noted that explosive detonations involve a potential for mortality and injury. However, the Service believed that, given the applicant's adoption of the U.S. Navy's conservative formula for protecting human divers from underwater explosives in calculating the proposed marine mammal safety zones, and the proposed monitoring and mitigation measures, no marine mammal or sea turtle would be seriously injured or killed as a result of the detonations. The Service therefore determined preliminarily that the effects of the proposed dredging and blasting activities should result, at most, in short-term, temporary modification of bottlenose dolphin (*Tursiops truncatus*) behavior (including temporarily vacating the area in the vicinity of the blasting operations) and would have no more than a negligible impact on marine mammal stocks.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the *Federal Register* notice and the application and provided comments to the Service on 10 March 2004. The Commission agreed with the Service's preliminary determination, provided that (1) before the applicant

initiates blasting, the Service review and approve the applicant's specific blasting plan, including the maximum weight of the explosives that would be used for each explosive event, (2) the mitigation and monitoring activities proposed in the application and the *Federal Register* notice are carried out as described, and (3) the monitoring program and observer effort are adequate to detect any marine mammals that may be within the danger or caution/safety zones calculated for each particular explosion. The Commission expressed the belief that, because estimates of the sound pressure levels to which animals would be exposed were derived by modeling, the applicant should be required to collect empirical data during its operations that could be used to assess the accuracy of the model. The Commission concurred with the general conclusion that the type of blasting proposed is unlikely to cause significant, long-lasting problems or changes in habitat use by marine mammals unless the animals are close to the source of a blast or exposure to blasting is frequent. The Commission noted, however, that it would be useful if the Service or the applicant conducted pre- and postblast surveys and monitored and mapped the distribution of high-intensity sound resulting from the shallow-water blasts to confirm that this is the case. The Commission also suggested that the Service require the applicant to conduct population surveys of bottlenose dolphins in the area before initiating the proposed activities. The Commission noted that, if the potential exists for manatees (*Trichechus manatus*) to be taken incidental to the proposed activities, authorization for such taking should be sought from the Fish and Wildlife Service. Finally, the Commission reiterated a point made in previous letters concerning small-take authorizations that an across-the-board definition of temporary threshold shift (TTS), or temporary change in hearing level, as constituting no more than Level B harassment inappropriately dismisses the potential for injuries and biologically significant behavioral effects (e.g., an increased risk of natural predation or ship strikes) that can result from repeated TTS harassment and from the cumulative effects of long-term exposure. The Commission therefore reiterated the past recommendation that TTS be considered as having the potential to injure marine mammals, therefore constituting Level A harassment.

**Dodge—Lummus Island Turning Basin, Miami, Florida**—On 21 January 2004 the National Marine Fisheries Service published a notice in the

*Federal Register* regarding a request from the Army Corps of Engineers to renew its incidental harassment authorization to take small numbers of bottlenose dolphins incidental to underwater dredging and blasting activities related to deepening the Dodge–Lummas Island Turning Basin in Miami, Florida. The Service preliminarily determined that bottlenose dolphins may modify their behavior to avoid the acoustic and visual disturbance, including temporarily vacating the area, but that such behavioral changes are expected to be short term. The Service therefore believed that the proposed action would have a negligible impact on the affected stocks. The Service further indicated that no take by injury or death was anticipated, and that taking by harassment should be at the lowest level practicable due to the mitigation measures proposed in the Service's *Federal Register* notice.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the notice and the application and provided comments to the Service on 22 March 2004. The Commission reiterated its recommendations and concerns expressed in the comments on the applicant's previous authorization request. The Commission continued to believe that the Service's preliminary determination was reasonable, provided that the proposed safety zone around each blast site is sufficient to ensure that marine mammals outside that zone will not be harmed and the monitoring program is effective in detecting all marine mammals within the safety zone. The Commission recommended that the Service issue the authorization provided that (1) before blasting begins, the Service review and approve the applicant's specific blasting plan, including the maximum weight of the explosives that would be used for each explosive event, and (2) the Service require the applicant to provide greater specificity with respect to the proposed mitigation measures and additional support for conclusions regarding the probability of sighting marine mammals within the areas subject to monitoring specific to the viewing platforms that will be used. Also, the Commission noted that, at the applicant's request, the Service is proposing to initiate rulemaking under section 101(a)5(A) of the Act to authorize the taking of marine mammals incidental to several additional dredging/blasting projects that the Corps is proposing to undertake over the next few years. The Commission encouraged the Corps and the Service to proceed with that rulemaking if (1) the proposed activities are

likely to extend beyond the one year covered by the requested incidental harassment authorization, (2) multiple dredging/blasting activities can appropriately be covered under a single rulemaking (e.g., only small numbers will be taken, the activities will occur within a specified geographic region, the impact of the taking on the affected stocks will be negligible, etc.), or (3) marine mammals may be killed or seriously injured incidental to the activities.

**Alafia River Navigation Channel, Tampa Harbor, Florida**—On 25 May 2004 the National Marine Fisheries Service published a notice in the *Federal Register* proposing to authorize the Army Corps of Engineers to take small numbers of bottlenose dolphins by harassment incidental to activities related to expanding and deepening the Alafia River Navigation Channel in Tampa Harbor, Florida. The Service noted that explosive detonations involve a potential for death and injury. However, inasmuch as the Corps had adopted the U.S. Navy's formula for protecting human divers from underwater explosives in calculating the designated marine mammal safety zones, and had proposed other monitoring and mitigation measures, the Service concluded that no marine mammal or sea turtle was expected to be seriously injured or killed as a result of the detonations. The Service preliminarily determined that the effects of the proposed dredging and blasting activities should result, at most, in short-term, temporary modification of bottlenose dolphin behavior (including temporarily vacating the area in the vicinity of the blasting operations), and that the proposed action would have a negligible impact on the affected stocks.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the *Federal Register* notice and the application and provided comments to the Service on 14 June 2004. The Commission noted that its comments on this application were essentially the same as those provided on the applicant's Brunswick Harbor project. The Commission recommended that, before the applicant initiates blasting, the Service (1) review and approve the site-specific blasting plan, including the maximum weight of the explosives that will be used for each explosive event, (2) evaluate whether the proposed monitoring activities and observer effort are adequate to detect any marine mammals that may be within the danger or caution/safety zones calculated for a particular explosion, and (3) incorporate into the incidental ha-

rassment authorization all of the mitigation and monitoring activities proposed in the application and the Service's *Federal Register* notice.

At the end of 2004 the Service was preparing an environmental assessment on all three of the Corps' proposed authorizations.

**Conoco Phillips Alaska, Inc.**—On 26 January 2004 the National Marine Fisheries Service published a notice in the *Federal Register* seeking comment on a request from Conoco Phillips Alaska, Inc., for authorization to take small numbers of ringed seals and bearded seals by harassment incidental to conducting on-ice seismic operations during oil and gas exploration activities in the Beaufort Sea off Alaska through 31 May 2004. The proposed activities were essentially the same as those for which incidental taking was authorized by the Service in March 2003 for the 2003 season. The Service preliminarily determined that the short-term impact of the proposed activities in the Beaufort Sea would result, at most, in a temporary modification in the behavior of ringed seals, and possibly a few bearded seals, and would have no more than a negligible impact on the affected marine mammal stocks.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the *Federal Register* notice and the application and provided comments to the Service on 9 March 2004. The Commission noted that, with the caveats noted in its 21 February 2003 letter commenting on Conoco Phillips' previous application, the Service's preliminary determination concerning the effects of the proposed activity seemed reasonable. In its 2003 letter, the Commission had recommended, among other things, that (1) before commencing on-ice seismic surveys after mid-March, a survey using experienced field personnel and trained dogs be conducted to identify seal structures (lair and breathing holes) along the planned travel routes, (2) the applicant be required to conduct surveys out to a distance of 150 meters on each side of all travel routes, and (3) should a seal be killed or seriously injured incidental to the proposed activities, the applicant be required to suspend its operations until the Service determines whether steps can be taken to avoid further injuries or mortalities or whether an incidental take authorization under section 101(a)(5)(A) of the Act to cover such taking is needed. In its 9 March 2004 letter, the Commission expressed a continuing concern that the proposed activities, in combination with similar activities being

carried out elsewhere in the Beaufort Sea, may cumulatively have more than negligible impact on marine mammal populations. Further, the Commission noted that, according to a National Academy of Sciences report entitled "Cumulative Effects of Oil and Gas Activities on Alaska's North Slope," "[c]limate warming at predicted rates in the Beaufort Sea region is likely to have serious consequences for ringed seals and polar bears, and those effects will accumulate with the effects of oil and gas activities in the region." The Commission reiterated its previous recommendation that the monitoring programs for the proposed activities be expanded to enable the Service to assess whether and, if so, to what extent long-term cumulative effects may be occurring. The Commission further recommended that the monitoring plan be designed to provide for the collection of data on potential changes in density and abundance of potentially affected marine mammals, reproductive rates, foraging patterns, distribution, and contaminant levels where oil and gas exploration, development, and production occur.

The Service issued the authorization on 4 March 2004, before receipt of the Commission's comments. The Service specified that before commencing on-ice seismic surveys after 20 March 2004, the applicant must either use trained dogs to survey the entire area for seal structures potentially affected by the sounds produced by the seismic survey equipment and conduct surveys for seal structures to a distance of at least 150 meters from the outer edges of the survey area; or use trained dogs to survey a subsample of the area potentially affected by the seismic survey and conduct surveys for seal structures to a distance of at least 150 meters from the outer edges of the area. The Service also indicated that the impact of take will be assessed by conducting a second seal structure survey (by biologists on snow machines using a global positioning system) immediately after completing the seismic surveys. The Service's authorization did not address the procedures to be followed in the event of a death or serious injury of a seal. The Service also did not require that monitoring programs for the proposed activities be expanded to provide information necessary to assess whether and, if so, to what extent long-term cumulative effects may be occurring.

**Boeing Company**—On 7 April 2004 the National Marine Fisheries Service published a notice in the *Federal Register* proposing to renew a one-year incidental harassment authorization for the take of small numbers of Pacific harbor seals, California sea

lions (*Zalophus californianus*), and northern elephant seals (*Mirounga angustirostris*) incidental to activities by the Boeing Company at Vandenberg Air Force Base, California, related to the Delta IV/Evolved Expendable Launch Vehicle (i.e., wharf modification, transport vessel operations, cargo movement, and maintenance dredging). The Service preliminarily determined that the effects of the proposed activities would be limited to Level B harassment (i.e., short-term startle responses and localized behavioral changes) of small numbers of the three pinniped species and would have no more than a negligible impact on the affected stocks.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the *Federal Register* notice and the application and provided comments to the Service on 10 May 2004. The Commission agreed that the Service's preliminary determinations were reasonable, provided that all reasonable measures would be taken to ensure the least practicable impact on the affected species and that the mitigation and monitoring activities described in the *Federal Register* notice and application be carried out as proposed.

The Service issued the requested incidental harassment authorization on 25 May 2004. The authorization incorporated all mitigation and monitoring activities described in Boeing's application and also required Boeing to take all reasonable measures to ensure the least practicable impact on the species, such as illuminating the area before dusk and initiating any activities to be conducted at night before dusk.

**Eglin Air Force Base, Florida**—On 22 April 2004 the National Marine Fisheries Service published a notice in the *Federal Register* proposing to issue a one-year authorization for the take of small numbers of marine mammals by harassment incidental to testing two air-to-surface weapons (the Joint Air-to-Surface Stand-off Missile AGM-158 A and B and the small-diameter bomb, GBU-39/B) within the Eglin Gulf Test and Training Range in the Gulf of Mexico. The Service also invited comments on the possibility of issuing regulations under section 101(a)(5)(A) of the Marine Mammal Protection Act at a later time that would govern the incidental taking of marine mammals for up to five years after the proposed one-year incidental harassment authorization expires. The Service noted that detonation of the weapons has the potential to cause harassment, injury, or mortality to

marine mammals. However, because of the extensive mitigation and monitoring measures proposed by the applicant, the Service believed that only taking by Level B harassment would occur and that the proposed action would have a negligible impact on the affected stocks.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the *Federal Register* notice and the application and provided comments to the Service on 24 May 2004. The Commission stated that the Service's preliminary determinations appeared to be reasonable, provided that the proposed mitigation and monitoring activities prove adequate to detect all marine mammals in the vicinity of the proposed operations and are sufficient to ensure that marine mammals are not being taken in unanticipated ways or numbers. The Commission noted, however, that even under the best of conditions and using experienced observers, there is more than an 80 percent likelihood that small cetaceans, particularly species such as dwarf (*Kogia sima*) or pygmy sperm whales (*K. breviceps*), will not be observed if they are in the vicinity of the test site. That being the case, the Commission questioned whether the proposed monitoring activities would be sufficient to ensure that marine mammals are not exposed to sound pressures or energy levels that could cause lethal injuries. The Commission therefore recommended that the Service, before issuing the requested authorization, provide further explanation of its rationale for determining that any taking will be by harassment only. The Commission further recommended that, if the Service determines that the potential for lethal injuries is sufficiently remote to warrant the issuance of an incidental harassment authorization under section 101(a)(5)(D) of the Act, any such authorization explicitly requires that operations be suspended immediately if a dead or seriously injured animal is found in the vicinity of the test site, pending review and authorization to proceed or issuance of regulations authorizing such takes under section 101(a)(5)(A) of the Act.

The Commission again expressed concern that the Service continues to categorize a temporary threshold shift (TTS) as constituting Level B harassment, discounting the potential that diminishment of hearing capability in marine mammals, even if only of limited duration, may cause impairment that could lead to injury or even death (e.g., by lowering the ability of an animal to detect and avoid predators or ships). The Commission added that the Service seems

to discount entirely the possibility that marine mammals may be harassed through changes in behavioral patterns other than by TTS. The Commission noted that additional explanation is needed and should consider, among other things, whether marine mammals might alter their use patterns in the vicinity of the detonations, or even abandon the area, as a result of infrequent or even a one-time exposure.

The Commission identified a need for the Service to provide a better explanation of, and justification for, the criteria used for (1) delimiting nonlethal injury (i.e., the onset of slight lung hemorrhage and a 50 percent probability level for eardrum rupture), and (2) establishing the “non-injurious behavioral response” threshold at a level 6 dB below TTS (i.e., 176 dB re 1 FPa<sup>2</sup>-s) as a reasonable criterion to assess potential behavioral responses of marine mammals. The *Federal Register* notice explained that the applicant was seeking adoption of an approach being developed by the Navy for “scaling” the peak pressure threshold to estimate more accurately the onset of TTS in marine mammals for small detonations while preserving the safety feature provided by the peak pressure threshold. The Service stated that it was currently reviewing the scientific basis for this approach and would make a determination on whether “scaling” is appropriate at some point in the future. The Commission recommended that any authorization issued to Eglin Air Force Base by the Service for the proposed weapons testing provide the full set of data, assumptions, and calculations relied on in reviewing the application.

Final action on the incidental harassment authorization was pending at the end of 2004.

**City of San Diego, California**—On 20 August 2004 the National Marine Fisheries Service published a notice in the *Federal Register* proposing to issue a one-year incidental harassment authorization for the taking of small numbers of Pacific harbor seals by Level B harassment incidental to cove wall replacement and bluff improvement projects at the Children’s Pool in La Jolla by the City of San Diego. The Service preliminarily determined that the short-term impact of the activities would result in no more than Level B harassment (e.g., short-term, localized changes in behavior) of small numbers of harbor seals.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the *Federal Register* notice and the application and provided comments to the Service on 24 September 2004. The

Commission concurred with the Service’s preliminary determinations concerning the impact of the proposed activities and recommended that the authorization be granted.

The Service issued the requested incidental harassment authorization on 19 November 2004.

**California Department of Transportation**—On 24 August 2004 the National Marine Fisheries Service published a notice in the *Federal Register* proposing to issue a one-year incidental harassment authorization for the taking of small numbers of Pacific harbor seals and California sea lions by the California Department of Transportation incidental to the demolition of the Sandholdt Road Bridge at Sandholdt Road, Moss Landing, California, and construction of a replacement bridge at that location. The Service preliminarily determined that the activities associated with the proposed project should result in no more than the temporary modification in behavior of small numbers of Pacific harbor seals and California sea lions. The Service noted that no take by injury or death is anticipated and harassment takes should be at the lowest level practicable due to incorporation of the proposed mitigation measures.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the *Federal Register* notice and the application and provided comments to the Service on 24 September 2004. The Commission concurred that the Service’s preliminary determinations were reasonable and recommended that the authorization be issued subject to inclusion of the proposed mitigation measures.

Final action on the incidental harassment authorization was pending at the end of 2004.

**Scripps Institution of Oceanography**—On 3 December 2004 the National Marine Fisheries Service published a notice in the *Federal Register* proposing to issue a one-year authorization for the taking of small numbers of cetaceans and pinnipeds by harassment incidental to conducting oceanographic surveys in the southwestern Pacific Ocean by the Scripps Institution of Oceanography. The Service believed that the impact of the seismic surveys would result, at most, in a temporary modification in the behavior of certain species of marine mammals and expected the activity to result in no more than a negligible impact on the affected species or stocks. The Service stated that no take by injury or death is anticipated and that the potential for temporary or permanent hearing impairment is low and will be avoided through

the mitigation measures it proposed to include in the authorization.

The Commission was preparing comments on the application at the end of 2004.

**Glenn R. Van Blaricom**—On 3 December 2004 the National Marine Fisheries Service published a notice in the *Federal Register* proposing to issue a one-year incidental harassment authorization for the taking of small numbers of Pacific harbor seals, California sea lions, and northern elephant seals incidental to conducting black abalone population surveys at San

Nicolas Island, California, by Glenn R. Van Blaricom. The Service preliminarily determined that the activities associated with the proposed study should result, at most, in the temporary disturbance of a relatively small number of pinnipeds and should have a negligible impact on the animals. The Service noted that no take by injury or death is anticipated and harassment takes should be at the lowest level practicable due to incorporation of the proposed mitigation measures.

The Commission was preparing comments on the request at the end of 2004.

## Appendix A-1

### SUMMARY OF MARINE MAMMAL COMMISSION RECOMMENDATIONS IN 2004 AND AGENCY RESPONSES

Note: For the second year, the Annual Report includes a summary of agencies' responses to Commission recommendations. If no response was received by 31 December 2004, this is indicated. Responses received in 2005 to the Commission's 2004 letters will appear in the 2005 Annual Report.

<b>Date of MMC Letter</b>	<b>MMC Comments</b>	<b>Date of Agency Response</b>	<b>Agency Response</b>
8 January	Ms. Patricia A. Kurkul, Northeast Regional Office, National Marine Fisheries Service, on the Service's plans to authorize an experimental fishing permit in the Great South Channel. Recommended that the Service prohibit any experimental fishing permits with longline gear in the designated Great South Channel right whale critical habitat area during the spring right whale concentration period.	26 January	The Commission's recommendation was not adopted. The Service noted that bottom longline and jig gear is currently allowed in the Great South Channel right whale critical habitat and the proposed exempted fishery permit would likely just redistribute some longline and jig effort within the designated critical habitat area and not increase it. The Service determined that the action being considered is not expected to destroy or adversely modify the right whale critical habitat that overlaps the action area; and impacts would be minimized by mitigation, including breakaway links on all vertical lines used in the fishery, and the use of observers.
8 January	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on request for a permit amendment from the Pacific Islands Fisheries Science Center, NMFS. Recommended approval of the amendment request.	—	—

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
13 January	Mr. William Hogarth, National Marine Fisheries Service, on the status of North Atlantic right whales and related management activities. Recommended, among other things, that the Service take immediate action to close all designated right whale critical habitat and adjacent areas known to be used repeatedly by large aggregations of right whales to all gillnet and trap fisheries during seasons of peak whale occurrence; convene a team of marine mammal, fisheries, and ecosystem scientists to review proposed measures identified by the Atlantic Large Whale Take Reduction Team and the National Marine Fisheries Service, and direct that team to develop recommendations for reducing right whale entanglement risks immediately, over the medium term (e.g., five years), and over the long term (up to 20 to 25 years) to required levels.	26 March	Noted that the Commission's recommendations concerning right whale critical habitat were largely addressed in a 30 December 2003 letter from the Service's Northeast Regional Administrator to the Commission, which recognized the need to consider revisions to right whale critical habitat. Noted that the Service intends to review the scientific information available to identify those physical and biological habitat features that are essential to the conservation of right whales and propose a revision to critical habitat accordingly. Noted that the possibility of establishing a scientific review group separate from the Atlantic Large Whale Take Reduction Team merits further discussion and offered to set up a meeting with the Commission and the Service to discuss the issue further.
15 January	Mr. Charlie R. Chandler, Division of Management Authority, U.S. Fish and Wildlife Service, on permit application from Florida Atlantic University to conduct scientific research on Florida manatees. Recommended approval with conditions.	6 October	Permit issued. Commission's recommendations adopted.
15 January	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from the Alaska SeaLife Center to collect, receive, import/export for analysis an unlimited number of specimens from six species of cetaceans and 11 species of pinnipeds for purposes of scientific research. Recommended approval with conditions.	9 April	Permit issued. Commission's recommendations adopted.

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
21 January	Mr. P. Michael Payne, Marine Mammal Division, National Marine Fisheries Service, on the Service’s proposed rule to designate the AT1 group of Alaska transient killer whales as “depleted” under the Marine Mammal Protection Act. Recommended that the Service designate the AT1 group as a depleted stock and reiterated its recommendation in previous letters (18 November and 23 December 2002) that the Service develop a long-term research plan for North Pacific killer whales.	—	—
30 January	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a request from Joe Mobley, Ph.D., for a permit amendment to authorize biopsy sampling and tagging of humpback whales and various other species of marine mammals in Hawaiian waters. Recommended approval with conditions.	30 June	Amendment issued. Commission’s recommendations adopted.
11 February	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Joanne Lunt, Wag TV, to closely approach and photograph northern elephant seals on Año Nuevo or Point Reyes, California. Recommended approval with conditions.	11 February	Permit issued. Commission’s recommendations adopted.
11 February	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from NOAA Pribilof Islands Restoration Project Office, National Ocean Service, to photograph northern fur seals on the Pribilof Islands.	27 February	Permit issued. Commission’s recommendations adopted.



Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
10 March	<p>Mr. P. Michael Payne, Office of Protected Resources, National Marine Fisheries Service, on a request from the U.S. Army Corps of Engineers—Jacksonville District for authorization to take small numbers of bottlenose dolphins by harassment incidental to activities related to deepening the inner harbor portion of the Brunswick Harbor in Glynn County, Georgia. Recommended, that, before the applicant initiates blasting, the Service review and approve the applicant’s specific blasting plan; and the mitigation and monitoring activities proposed in the application and the Service’s Federal Register notice are carried out as described, and that the proposed monitoring activities and observer effort are adequate to detect any marine mammals that may be within the danger or caution/safety zones calculated for a particular explosion. Reiterated previous recommendation that temporary threshold shifts be considered as having the potential to injure marine mammals (i.e., Level A harassment).</p>	—	<p>The Service was in the process of writing an environmental assessment at year’s end.</p>

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
22 March	<p>Mr. P. Michael Payne, Office of Protected Resources, National Marine Fisheries Service, on a request from the U.S. Army Corps of Engineers for authorization to take small numbers of bottlenose dolphins by harassment incidental to activities related to deepening the DodgeBLummus Island Turning Basin in Miami, Florida. Recommended that before the Corps initiates blasting, the Service review and approve the applicant’s blasting plan; and the Service require the applicants to provide greater specificity with respect to the proposed mitigation measures and the probability of sighting marine mammals within the area subject to monitoring specific to the viewing platforms that will be used. The Commission noted the Service’s proposal to initiate rulemaking to authorize the taking of marine mammals incidental to several additional dredging/blasting projects that the Corps is proposing to undertake over the next few years. Encouraged the Corps and the Service to proceed with such a rulemaking if (1) the activities are likely to extend beyond the one-year period covered by the requested incidental harassment authorization, or (2) multiple dredging/blasting activities can appropriately be covered under a single rulemaking (e.g., only small numbers will be taken, the activities will occur within a specified geographic region, the impact of the taking on the affected stocks will be negligible, etc.).</p>	—	<p>The Service was in the process of preparing an environmental assessment at year’s end.</p>
22 March	<p>Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a request from the Department of the Navy for authorization, pursuant to the National Defense Authorization Act of 1986, to receive one bottlenose dolphin from Sea World of California. Recommended approval.</p>	22 March	<p>Authorization granted. Commission’s recommendation adopted.</p>

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
22 March	Mr. Charlie R. Chandler, Division of Management Authority, U.S. Fish and Wildlife Service, on a permit application from Seward Association for the Advancement of Marine Science, Alaska SeaLife Center, to import from Russia samples taken from sea otters and Pacific walruses for scientific research. Recommended approval with conditions.	7 September	Permit issued. Commission's recommendations adopted.
23 March	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Sea World, Inc., to import one beluga whale and one Commerson's dolphin for purposes of public display. Recommended approval with conditions.	23 July	Permit issued. Commission's recommendations adopted.
23 March	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a request from Mystic Aquarium for a permit amendment to authorize collection of marine mammal tissue samples from additional species and sources. Recommended approval of the request, provided that the conditions contained in the permit remain in effect.	28 April	Amendment issued. Commission's recommendations adopted.
7 April	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a request from James Gilbert, Ph.D., for permit amendment to authorize additional research studies, numbers of harbor seals, and co-investigators under the permit. Recommended approval of the request provided that the conditions contained in the permit remain in effect.	28 April	Amendment issued. Commission's recommendations adopted.

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
7 April	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a request from Belinda Rubinstein, New England Aquarium, for a permit amendment to authorize additional studies and number of pinnipeds under the permit. Recommended that subject to receipt of additional information, the request be approved, provided that the conditions contained in the permit remain in effect.	28 April	Amendment issued. Commission's recommendations adopted.
9 April	Mr. Charlie Chandler, Division of Management Authority, U.S. Fish and Wildlife Service, on a permit application from Dallas World Aquarium to continue to maintain for purposes of rehabilitation two Antillean manatees currently on public display. Recommended that the applicant be required to submit additional information concerning the rehabilitation/enhancement activities that have taken place to date and the specific additional steps that are needed to prepare the animals for release to the wild, along with a proposed timetable for completing the rehabilitation efforts and returning the animals to their natural habitat. Recommended that as an interim measure the Service extend the authority for the Dallas World Aquarium to maintain the manatees for an additional six months to enable the facility to provide the requested information and the agencies sufficient time to review and act on that information, and, if the animals are determined to be releasable, to make the necessary arrangements to accomplish their return to the wild.		Action on permit was pending at year's end.
15 April	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Brendan Kelly, Ph.D., to conduct scientific research on ringed seals. Recommended approval with conditions pending the Service's receipt of additional information.	23 April	Permit issued. Commission's recommendations adopted.

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
21 April	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Daniel Engelhaupt to conduct scientific research on various cetacean species. Recommended approval with conditions, pending the Service’s receipt of additional information.	—	—
21 April	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Jennifer A. Hurley, Ph.D., to acquire from U.S. rehabilitation facilities up to four California sea lions and two harbor seals for the purpose of public display. Recommended approval with conditions.	—	—
21 April	Mr. Stephen L. Leathery, Chief, Permits Division, Office of Protected Resources, National Marine Fisheries Service, on a request from Randall W. Davis, Ph.D., for permit amendment to increase the number of sperm whales authorized to be taken under the permit. Recommended approval, provided that the conditions contained in the permit remain in effect.	—	—
26 April	Mr. G. B. Hall, Ph.D., St. Johns River Management District, on the proposal by the St. Johns River Water Management District to amend Chapter 40C-8 of the Florida Administrative Code to establish minimum flow levels for Blue Spring in Volusia County. Recommended that the proposed rule be changed to establish a single, immediately effective minimum flow level of 157 cfs, and the District develop and implement a management program for spring outflow to assure that flows during the winter are adequate to maintain water temperature in Blue Spring and adjacent run at above 20 EC.	1 June	Responded that the Commission’s concerns will be considered during the rulemaking process.

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
3 May	Mr. Garth Griffin, Protected Resources Division, National Marine Fisheries Service, Portland, Oregon, on the Service's status review of the eastern North Pacific southern resident stock of killer whales. Reiterated recommendation contained in earlier letter on previous draft that the Service take a precautionary approach to the designation of distinct population segments in light of the considerable uncertainty regarding the taxonomic status of killer whales; and the Service review the Senate Report 151, 96th Congress, 1st Session, 1979, to determine if the Service's previous interpretation with regard to killer whales is, in fact, consistent with the instructions provided in that report.	—	—
3 May	Mr. Charlie Chandler, Division of Management Authority, U.S. Fish and Wildlife Service, on a permit application from Boone and Crockett Club to import one pair of walrus tusks from Canada for purposes of public display. Recommended action on the application be deferred pending review of the applicant's efforts to obtain a pair of walrus tusks from alternative sources. Recommended that the Service work with the National Marine Fisheries Service to develop a consistent interpretation concerning the Act's public display provisions.	22 June	Permit issued. Acknowledged the Commission's concerns regarding possible inconsistency between the applicant's request and the policies and purposes of the Marine Mammal Protection Act; that the Service's draft policy on lethal taking of marine mammals for purposes of public display has not yet been finalized; believes that the import of legally acquired specimens that are not intentionally killed to obtain specimens for public display is allowable under the Act for purposes consistent with the Act and with the Service's draft policy.
3 May	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a request from Kate M. Wynne, University of Alaska, for a permit amendment to increase the number of humpback and fin whales that are authorized to be tagged and harassed under the permit, and to collect and retain skin cells that adhere to suction cup tags. Recommended approval with conditions.	20 July	Amendment issued. Commission's recommendations adopted.

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
3 May	Mr. Charlie Chandler, Division of Management Authority, U.S. Fish and Wildlife Service, on a permit application from Randall W. Davis, Texas A&M University, to conduct scientific research on Alaska sea otters. Recommended approval with conditions.	6 October	Permit issued. Commission's recommendations adopted.
3 May	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on the request from the National Marine Mammal Laboratory for a permit amendment to authorize an increase in the number of beluga whales authorized to be biopsy sampled. Recommended approval, provided that the conditions contained in the permit remain in effect.	5 May	Amendment issued. Commission's recommendations adopted.
10 May	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Ocean Futures Society to harass gray whales and killer whales during filming activities for purposes of commercial/educational photography. Recommended approval with conditions.	4 June	Permit issued. Commission's recommendations adopted.
10 May	Mr. Michael Payne, Office of Protected Resources, National Marine Fisheries Service, on an application from the Boeing Company to renew a one-year incidental harassment authorization authorizing the take of small numbers of pinnipeds incidental to activities related to the Delta IV/Evolved Expendable Launch Vehicle (EELV) at South Vandenberg Air Force Base, California. Recommended approval of the request provided that all reasonable measures will be taken to ensure the least practicable impact on the subject species and that the required mitigation and monitoring activities be carried out as described in the Service's 7 April 2004 Federal Register notice and the subject application.	25 May	Incidental harassment authorization issued. Commission's recommendations adopted. See Chapter IX, Small-Take Authorizations.

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
13 May	Rosa Meehan, Ph.D., Marine Mammals Management Office, U.S. Fish and Wildlife Service, on the Service's proposal to list the southwest Alaska population of northern sea otters as threatened under the Endangered Species Act. Recommended that the Service proceed with the listing and move expeditiously to establish a recovery team, begin work on developing a recovery plan, and evaluate options for designating critical habitat.	13 July	Letter stated that Service agreed with the Commission's comments although the Service's resources were limited and could not at that time support a dedicated study to look at the genetic structure of the southwest population of sea otters in Alaska. Service was in the process of preparing a final rule for publication in early 2005 and if the population ended up being listed as threatened, the Service would set up a recovery team to work on a recovery plan.
14 May	Mr. Robert Smith, Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve, commenting on the National Ocean Service's Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve Draft Final Reserve Operations Plan, March 2004. Recommended that, in preparing the final plan, the Service adopt all the recommended changes made on the draft plan by the Advisory Council at its 29 April 2004 meeting.	—	Notice of Availability of the Final Reserve Operations Plan for the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve published on 15 October 2004. Some of the Commission's comments addressed in the notice.
17 May	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on four scientific research permit applications from Andrew Read, Ph.D., Robert DiGiovanni, Mark Baumgartner, Ph.D., and Ann Pabst, Ph.D., and one request for a permit amendment from Mason Weinrich. Research involved taking by harassment of various cetacean species. Noted that the Service is preparing an environmental assessment on the potential impacts of issuing authorizations for the subject research projects, three of which involve the taking by harassment of North Atlantic right whales. Recommended approval of the permits and amendment request with conditions.	—	—

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
17 May	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Theater of the Sea to import an Atlantic bottlenose dolphin from Canada for purposes of public display. Recommended approval with conditions.	21 May	Permit issued. Commission's recommendations adopted.
17 May	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Sea World, Inc., to import one beluga whale from Canada for purposes of public display. Recommended approval with conditions.	21 May	Permit issued. Commission's recommendations adopted.
17 May	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Daniel Costa, Ph.D., to conduct scientific research on northern elephant seals and to euthanize up to 10 orphaned, terminally moribund pups for scientific research purposes. Recommended approval with conditions.	17 September	Permit issued. Commission's recommendations adopted.
17 May	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on permit application from Michael Williams to conduct scientific research on fur seals. Recommended approval with conditions.	17 June	Permit issued. Commission's recommendations adopted.
17 May	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Daniel F. Cowen, M.D., to acquire, import/export, and maintain samples of blood, tissues, and body fluids from all cetacean and pinniped species (except walruses) for scientific research. Recommended approval of the permit with conditions. Reiterated recommendation on similar applications that the Service should consider adopting a generic approach for authorizing the collection and use of specimen materials by institutions for eventual use for research purposes.	2 November	Permit issued. Commission's recommendations adopted.

<b>Date of MMC Letter</b>	<b>MMC Comments</b>	<b>Date of Agency Response</b>	<b>Agency Response</b>
24 May	<p>Mr. Michael Payne, Office of Protected Resources, National Marine Fisheries Service, on a request from Eglin Air Force Base for authorization to take small numbers of marine mammals incidental to weapons testing in the Gulf of Mexico and the possible later issuance of regulations to govern the activities for up to five years after the proposed one-year incidental harassment authorization expires. Recommended, among other things, that the Service, before issuing the requested authorization, further explain its rationale for determining that any taking will be by harassment only; and if the Service determines to issue an incidental harassment authorization under section 101(a)(5)(D) of the Act, such authorization require that operations be suspended immediately if a dead or seriously injured animal is found in the vicinity of the test site, pending review and authorization to proceed or issuance of regulations authorizing such takes under section 101(a)(5)(A) of the Act. Expressed concern that the Service continues to categorize temporary threshold shift as constituting Level B harassment. Noted that the applicant was seeking adoption of an approach being developed by the Navy for “scaling” the peak pressure threshold to estimate more accurately the onset of temporary threshold shifts in marine mammals. Recommended that any authorization issued to Eglin Air Force Base for the proposed weapons testing provide the full set of data, assumptions, and calculations relied on in reviewing the application.</p>	22 April	<p>Service was preparing incidental harassment authorization at year’s end.</p>

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
1 June	Mr. Michael Payne, Office of Protected Resources, National Marine Fisheries Service, on the Service's proposed rule for defining the term zero mortality rate goal (ZMRG) under the Marine Mammal Protection Act. Recommended that the Service select option 1, as indicated in the proposed rule, to define the ZMRG; that option 1 be modified to address situations in which 10 percent of potential biological removal (PBR) still constitutes a relatively large number; and the final rule explicitly state that ZMRG has not been met if mortality and serious injury exceed the ZMRG threshold calculated for a stock when further reductions were not immediately feasible due to technological or other limitations.	—	—
7 June	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from the University of Florida to acquire, import and re-export, maintain, and analyze samples from all cetacean and pinniped species (except walrus) for purposes of scientific research. Recommended approval with conditions.	2 August	Permit issued. Commission's recommendations adopted.

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
14 June	<p>Mr. Michael Payne, Office of Protected Resources, National Marine Fisheries Service, on an application submitted by the U.S. Army Corps of Engineers—Jacksonville District to take small numbers of bottlenose dolphins by harassment incidental to activities related to expanding and deepening the Alafia River Navigation Channel in Tampa Harbor, Florida. Recommended approval of the request, provided that before the applicant initiates blasting, the Service review and approve the applicant’s specific blasting plan, and evaluate whether the proposed monitoring activities and observer effort are adequate to detect any marine mammals that may be within the danger or caution/safety zones calculated for a particular explosion; and all mitigation and monitoring activities proposed in the application and the Service’s Federal Register notice be incorporated into the incidental harassment authorization for this project. Reiterated previous recommendations that temporary threshold shifts be considered as having the potential to injure marine mammals (i.e., Level A harassment).</p>	—	<p>Service was in the process of writing an environmental assessment at year’s end.</p>

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
14 June	Mr. Michael Payne, Office of Protected Resources, National Marine Fisheries Service, on the Service's proposed rulemaking regarding the List of Fisheries for 2004. Reiterated its recommendation that the Service provide a better description of the basis for its rankings in the annual List of Fisheries, including the level of observer coverage in each fishery. Recommended that the Service recategorize the Hawaii longline fishery as category I; promptly update the relevant stock assessment reports with the new fishery delineations, determine which Alaska fisheries are responsible for the takes, and recategorize the fisheries accordingly; review its monitoring and management scheme to ensure that it is providing adequate protection for the western North Pacific Stock of humpback whales; and recategorize the Gulf of Mexico blue crab trap/pot fishery as category II and the Gulf of Mexico menhaden purse seine fishery as category I and direct more observer effort to determining the level of fisheries interaction with bottlenose dolphins.	—	—
6 July	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Patrick Butler, Ph.D., University of Birmingham, U.K., to conduct scientific research on three species of pinnipeds being maintained for rehabilitation at The Marine Mammal Center in Sausalito, California. Recommended approval with conditions.	22 November	Permit issued. Commission's recommendations adopted.
6 July	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a request from Markus Horning, Ph.D., for a permit amendment to authorize additional research activities. Recommended approval with conditions.	12 November	Amendment issued. Commission's recommendation adopted.

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
5 August	Mr. Michael Payne, Office of Protected Resources, National Marine Fisheries Service, on the Service's Advance Notice of Proposed Rulemaking concerning a strategy to reduce ship collisions with right whales. Concurred with all of the Service's identified operational measures and provided various specific recommendations regarding the proposal and its implementation.	—	No response received in 2004. Action still pending at year's end.
5 August	Mr. Peter Young, Hawaii Division of Aquatic Resources, Honolulu, Hawaii, on the State's proposed rules to establish the Northwestern Hawaiian Islands Marine Refuge. Suggested specific language to address certain points and expressed the belief that, with such changes, the proposed rule will be a fitting and highly effective conservation measure and urged adoption of the proposed rule as quickly as possible.	—	No response received in 2004. Action still pending at year's end.
6 August	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from the National Marine Mammal Laboratory, National Marine Fisheries Service, to conduct scientific research on three species of ice seals. Recommended approval with conditions.	1 September	Permit issued. Commission's recommendations adopted.
6 August	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Howard C. Rosenbaum, Ph.D., Wildlife Conservation Society, for authorization to obtain, import, and export dead marine mammals or samples therefrom, and samples from free-ranging and captive marine mammals of all species obtained from a variety of sources for purposes of scientific research. Recommended approval with conditions.	—	Action on application pending at year's end.

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
6 August	Mr. Charlie R. Chandler, Division of Management Authority, U.S. Fish and Wildlife Service, on a request from the Fish and Wildlife Service/Marine Mammal Management, for a permit amendment to authorize extension of the permit and the conduct of scientific research on Alaska sea otters. Recommended approval with conditions.	31 August	Amendment issued. Commission's recommendations adopted.
6 August	Mr. Charlie R. Chandler, Division of Management Authority, U.S. Fish and Wildlife Service, on a permit application from the National Museum of the American Indian, Smithsonian Institution, to import handicraft items for public display purposes. Reiterated previous recommendation that the Fish and Wildlife Service work with the National Marine Fisheries Service and the Commission to resolve inconsistencies in the Service's interpretations of section 104(c)(2) of the Marine Mammal Protection Act.	9 September	Permit issued. Commission's recommendations partially adopted.
9 August	Vice Admiral Conrad Lautenbacher, Jr., Department of Commerce, commenting on the needed guidance for developing regulations for various types of fishing that might be allowed in a Northwest Hawaiian Islands national marine sanctuary and requested that the Department of Commerce ensure that the guidance the Service gives to the Western Pacific Fishery Management Council is in keeping with the long-term management needs for this unique and internationally important ecosystem. Recommended various management options that the National Ocean Service should include in the guidance it provides to the Western Pacific Fishery Management Council.	3 September	Responded that NOAA is considering the Commission's comments and recommendations as it develops the request to the Western Pacific Fishery Management Council.

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
1 September	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a request from the Waikiki Aquarium for a permit amendment for authorization to continue the long-term maintenance of two Hawaiian monk seals for purposes of scientific research and enhancement. Recommended approval with conditions.	—	—
1 September	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a request from the Alaska SeaLife Center for a permit amendment for authorization of an additional scientific research project on eight Pacific harbor seals maintained at the Center. Recommended approval with conditions.	—	—
9 September	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a request from Daniel Costa, Ph.D., for a permit amendment for authorization of additional numbers of southern elephant seals and additional studies under the permit. Recommended approval with conditions.	8 December	Amendment issued. Commission's recommendations adopted.
15 September	Mr. Charlie R. Chandler, Division of Management Authority, U.S. Fish and Wildlife Service, on a permit application from the Museum of Vertebrate Zoology to export tissue from a southern sea otter for purposes of scientific research. Recommended approval of the permit with conditions.	10 October	Permit issued. Commission's recommendations adopted.
24 September	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on an application from the California Department of Transportation for authorization to take small numbers of marine mammals incidental to the demolition of the Sandholdt Road Bridge, Moss Landing, California, and construction of a replacement bridge. Concurred that the Service's preliminary determinations are reasonable and that the proposed mitigation measures are appropriate.	—	Incidental harassment authorization in preparation at year's end.

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
24 September	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on an application from the City of San Diego, California, for authorization to take small numbers of marine mammals incidental to cove wall replacement and bluff improvements projects at the Children’s Pool in La Jolla, California. Concurred that the Service’s preliminary determinations are reasonable and that the proposed mitigation measures are appropriate.	19 November	Incidental harassment authorization issued. Commission’s recommendations adopted. See Chapter IX, Small-Take Authorizations.
24 September	Mr. Charlie Chandler, Division of Management Authority, U.S. Fish and Wildlife Service, on a request from the New College of Florida for a permit amendment for authorization of an additional research project under the permit. Recommended approval of the request with conditions.	—	Action on amendment request was pending at year’s end.
15 October	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Bruce Mate, Ph.D., to conduct scientific research on cetaceans. Recommended that the Service defer approval of the application request pending receipt of additional information. Reserved comment on the portion of the application requesting authorization to tag and biopsy-sample North Atlantic and North Pacific right whales pending review of the programmatic environmental impact statement being prepared by the Service. Recommended if the Service prepares an environmental assessment on the permit application that it make the assessment available to the public for review and comment.	—	—

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
12 November	Mr. P. Michael Payne, Office of Protected Resources, National Marine Fisheries Service, on the Service’s draft revised recovery plan for North Atlantic right whales. Recommended that the Service revise the draft plan to clarify that past management measures have not significantly reduced human-related right whale deaths and injuries and to underscore the urgent need for developing and implementing substantially improved measures as quickly as possible. Recommended that the Service reexamine and revise two downlisting criteria to provide clearer and more appropriate standards.	—	No response received in 2004.
23 November	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a request from the National Marine Mammal Laboratory, National Marine Fisheries Service, for a permit amendment for authorization of two additional accidental mortalities under the permit. Recommended approval of the request with conditions.	17 December	Amendment issued. Commission’s recommendations adopted.
15 December	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on three permit applications from Dan Salden, Deborah Glockner-Ferrari, and Craig O. Matkin for scientific research on North Pacific humpback whales. Recommended approval with conditions.	—	Action pending at year’s end.

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
29 December	Mr. Charlie R. Chandler, Division of Management Authority, U.S. Fish and Wildlife Service, commenting on a report from the Western Ecological Research Center, U.S. Geological Survey, concerning the accidental death of a sea otter under scientific research permit. Recommended that authorization to continue capture operations and implantation of transmitters under the permit be granted, provided that the changes to the capture protocol noted by the permittee and the Service are fully implemented and the other conditions of the permit remain in effect.	—	Action on reauthorization request was pending at year's end.
30 December	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Colleen R. Kastak, Ph.D., to conduct scientific research on seven pinnipeds maintained at Long Marine Laboratory. Recommended approval with conditions.	27 December	Permit issued. Commission's recommendations adopted.
30 December	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on the Service's proposal to promulgate regulations that would allow the Alaska Aerospace Development Corporation to take by incidental harassment small numbers of Steller sea lions during rocket launches and associated activities from the Kodiak Launch Complex on Kodiak Island, Alaska. Recommended issuance of small-take regulations for the proposed activities, provided that the mitigation, monitoring, and reporting requirements described in the Service's proposed rule are incorporated therein. Recommended that the proposed monitoring program be expanded to determine the effects of the activities on harbor seals, sea otters, and other marine mammal species to determine if authorizations for these species are needed or, if authorization to take these species is provided, to verify that the impacts on the affected stocks are negligible.	—	Proposed rule was published 29 October 2004; final rule was in preparation at year's end. See Chapter IX, Small-Take Authorizations.

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
30 December	<p>Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a request from BP Exploration for authorization to continue taking small numbers of bowhead, gray, and beluga whales and ringed, spotted, and bearded seals by harassment incidental to oil production operations at the Northstar oil and gas facility in state and federal waters and the Service’s proposal to promulgate new regulations that would governing the taking. Recommended that the Service initiate the proposed rulemaking, provided that it is satisfied that: the planned marine mammal and related monitoring programs will be adequate to verify how and over what distances marine mammals may be affected; only small numbers of marine mammals will be taken; and the cumulative impacts of the proposed activities on the affected species and stocks will be negligible. Recommended that a rigorous monitoring program sufficient to detect any nonnegligible effects be pursued to ensure that the activities are not individually or cumulatively having any population-level effects on marine mammals and are not adversely affecting the availability of marine mammals for subsistence uses by Alaska Natives.</p>	—	Proposed rule was in preparation at year’s end.

## Appendix A-2

### SUMMARY OF MARINE MAMMAL COMMISSION RECOMMENDATIONS IN 2003 FOR WHICH RESPONSES WERE RECEIVED IN 2004

<b>Date of MMC Letter</b>	<b>MMC Comments</b>	<b>Date of Agency Response</b>	<b>Agency Response</b>
8 January 2003	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on an application from Jerome Siegel, Ph.D., to conduct scientific research on several species of marine mammals. Recommended approval with conditions.	31 March 2004	Permit issued. Commission's recommendations adopted.
16 January 2003	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on scientific research permits to continue research on humpback whales in Hawaii, by Rachel Cartwright, Deborah Glockner-Ferrari, Joseph Mobley, Jr., and Robin Baird. Recommended approval.	—	—
3 March 2003	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on an application from Ann Zoidis to conduct scientific research on humpback whales in Hawaii waters. Recommended approval with conditions.	30 June 2004	Permit issued. Commission's recommendations adopted.

<b>Date of MMC Letter</b>	<b>MMC Comments</b>	<b>Date of Agency Response</b>	<b>Agency Response</b>
7 March 2003	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on supporting information for an application from the Alaska SeaLife Center to conduct scientific research on Steller sea lions. Recommended approval, provided that the applicant provide various clarifications and additional information to the Service.	14 January 2004	Permit issued. Commission's recommendations adopted.
10 March 2003	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on an application from Janice Straley to conduct scientific research on humpback whales and killer whales in Alaska. Recommended approval of the permit with conditions.	30 June 2004	Permit issued. Commission's recommendations adopted.
3 April 2003	Thomas C. Eagle, Ph.D., Office of Protected Resources, National Marine Fisheries Service, regarding the request by the Minerals Management Service for authorization to take small numbers of sperm whales and several other marine mammal species in the Gulf of Mexico incidental to conducting seismic surveys during oil and gas exploration activities over a five-year period, and the Service's proposal to promulgate regulations to authorize the requested activity. Concurred that the Service's intent to propose regulations to govern the taking is appropriate.	—	—

<b>Date of MMC Letter</b>	<b>MMC Comments</b>	<b>Date of Agency Response</b>	<b>Agency Response</b>
16 April 2003	<p>Mr. John H. Dunnigan, Office of Sustainable Fisheries, National Marine Fisheries Service, on the proposed rulemaking regarding the revision of national standard 1 guidelines for U.S. fisheries. Recommended that the Service broaden the definitions of overfished and overfishing to account for adverse effects from ecosystem overfishing, and development management procedures that require consistent, rigorous, and systematic evaluation of its potential adverse effects; review the theoretical framework for setting of catch levels, identify the major assumptions inherent in that framework, establish experimental methods to test those assumptions, and, until they have been validated, manage the fisheries in a more precautionary manner; review its science/management regime to identify and implement mechanisms that can be used to distinguish natural and fishery-related changes; not combine individual species into complexes for the purpose of management aimed at achieving national standard 1; review its procedures for providing scientific information to fisheries managers seeking to achieve national standard 1 and take the steps necessary to ensure that the information is accompanied by appropriate measures of uncertainty or, conversely, confidence; and broaden its definition of a precautionary approach under national standard 1 to address possible effects to nontarget species and the ecosystem generally.</p>	—	—

<b>Date of MMC Letter</b>	<b>MMC Comments</b>	<b>Date of Agency Response</b>	<b>Agency Response</b>
6 May 2003	<p>Vice Admiral Conrad C. Lautenbacher, Jr., Ph.D., concerning the increasing frequency with which marine mammals are being subjected to taking by harassment through directed human/marine mammal interactions, and NOAA's response to those ongoing violations of the Marine Mammal Protection Act. Noted that commercial operators in Hawaii routinely offer the public opportunities to swim with spinner dolphins—a situation that is adversely affecting the animals' behavior. Noted that NMFS representatives at the Commission's 2002 annual meeting in San Diego, California, stated that this issue is given low priority by the Service. Noted that it is imperative that NOAA do more to address the situation in Hawaii, including education and enforcement activities. Noted that a similar heightening of enforcement and prosecutorial effort is needed in the Southeast Region, where dolphin swim programs (and dolphin feeding) have proliferated in recent years.</p>	6 January 2004	<p>Responded that NOAA maintains a multifaceted enforcement program designed to protect marine mammals against unlawful harassment; many of the issues raised by the Commission have been addressed in the Service's testimony before Congress; and the agency is in the process of promulgating regulations that more specifically address the activities of concern.</p>
23 May 2003	<p>Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, regarding the Pacific Whale Foundation's Letter of Intent to Conduct Research Under the General Authorization. Recommended that the Service be satisfied that the applicant has satisfactorily addressed several issues concerning the results of past research activities and research results, before issuing a letter of confirmation.</p>	—	—

<b>Date of MMC Letter</b>	<b>MMC Comments</b>	<b>Date of Agency Response</b>	<b>Agency Response</b>
6 June 2003	<p>Samuel Pooley, Ph.D., Pacific Islands Regional Office, National Marine Fisheries Service, commenting on supplemental fishery management plan amendments on fisheries off the U.S. West Coast and in the western Pacific. Recommended that the Service revise the environmental assessment to (1) correctly describe the intent and effects of the executive orders and appropriately remove the discussion of overfishing and control rules for the lobster fishery unless it is clear that they pertain only to areas outside the reserve, and (2) include a thorough description of the available information on stock status; methods of assessment; potential sources of error, bias, and uncertainty and the potential consequences of such information (or lack thereof) on management of fisheries at low stock levels. Reiterated previous recommendation to the Service that the Service broaden the definitions of overfished and overfishing to account for adverse effects from ecosystem overfishing, and develop control rules and other management procedures that require consistent, rigorous, and systematic evaluation of potential adverse effects of fishing activities. Recommended that the Service: not combine individual species into complexes for the purposes of allowing fishing on those complexes or assessing the effects of fisheries on them; before any fisheries on the subject species are initiated or expanded, develop reliable methods for assessing stock status and fishing mortality rate; and prepare a programmatic environmental impact statement on the associated fisheries to ensure that, in the face of the many existing uncertainties, the fishery management regimes for these fisheries are conducted in an environmentally sound manner.</p>	—	—

<b>Date of MMC Letter</b>	<b>MMC Comments</b>	<b>Date of Agency Response</b>	<b>Agency Response</b>
7 July 2003	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on Sea World, Inc.'s requested authorization to maintain permanently in captivity a nonreleasable rehabilitated juvenile male Guadalupe fur seal for enhancement purposes. Recommended that authorization for the proposed activities be provided under section 109(h) and 112(c) of the Marine Mammal Protection Act, rather than under a section 104 enhancement permit; and the Service use its authority under section 109(h) to authorize display of the animal incidental to its care and maintenance by Sea World.	21 May 2004	Permit issued. Commission's recommendations adopted.

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
15 July 2003	<p>Ms. Kaja Brix, Office of Protected Resources, National Marine Fisheries Service, regarding an application from the Monterey Bay National Marine Sanctuary for authorization to take small numbers of California sea lions and harbor seals by Level B harassment incidental to permitting professional fireworks displays within the sanctuary, and the Service’s proposal to promulgate regulations to authorize the activity over a five-year period. Concurred with the Service’s preliminary determinations concerning the impacts of the proposed activities on the subject species but noted that the Service should consult with the Fish and Wildlife Service as to the possible need to secure a separate authorization for the incidental taking of California sea otters. Recommended that (1) any authorization issued specify that, if a mortality or serious injury of a marine mammal occurs that appears to be related to the fireworks displays, further fireworks events be suspended while the Service determines whether steps can be taken to avoid further injuries or mortalities or until such taking can be authorized by regulations; and (2) before issuing the requested authorization, the Service be satisfied that the applicant’s monitoring program is sufficient to detect the effects of the proposed activities including any mortality and/or serious injury resulting from startle responses, stampedes, or unexploded fireworks devices.</p>	—	—
23 July 2003	<p>Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Fred Sharpe to conduct scientific research on Pacific humpback whales. Recommended approval with conditions.</p>	30 June 2004	Permit issued. Commission’s recommendations adopted.

<b>Date of MMC Letter</b>	<b>MMC Comments</b>	<b>Date of Agency Response</b>	<b>Agency Response</b>
29 July 2003	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from the National Marine Mammal Laboratory to conduct scientific research on various species of cetaceans. Recommended approval with conditions.	30 June 2004	Permit issued. Commission's recommendations adopted.
29 July 2003	Ms. Mary Colligan, Northeast Regional Office, National Marine Fisheries Service, regarding the notice of intent to prepare an environmental impact statement on actions to implement the Atlantic Large Whale Take Reduction Plan. Recommended that the Service, in the anticipated environmental impact statement, clearly identify the whale protection standards it is required to achieve under the applicable statutes and analyze and present in the draft environmental impact statement all available data regarding Atlantic large whale natural history and interactions with fisheries in a way that identifies the regulation measures that would be necessary to meet these standards.	—	No action taken. Environmental impact statement not completed in 2004.
6 August 2003	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Kate M. Wynne, University of Alaska, to conduct scientific research on three species of large whales. Recommended approval with conditions.	30 June 2004	Permit issued. Commission's recommendations adopted.
7 August 2003	Mr. Charlie R. Chandler, Division of Management Authority, U.S. Fish and Wildlife Service, on a permit application from Jennifer Miksis, University of Rhode Island, to conduct scientific research on Florida manatees.	31 March 2004	Permit issued. Commission's recommendations adopted.

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
20 August 2003	Mr. Charlie R. Chandler, Division of Management Authority, U.S. Fish and Wildlife Service, on a permit renewal from the Jacksonville Field Office, U.S. Fish and Wildlife Service, to conduct scientific research on Florida manatees for purposes of enhancement associated with rehabilitation and postrelease monitoring activities. Recommended approval of the requested permit with conditions.	—	—
29 August 2003	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit amendment request from the Center for Coastal Studies to allow the re-sampling of humpback whales authorized to be biopsy-sampled under the permit. Recommended approval with conditions.	—	—
10 September 2003	Ms. Laurie Allen, Office of Protected Resources, National Marine Fisheries Service, regarding the proposed rulemaking on the Zero Mortality Rate Goal (ZMRG). Recommended that the Service adopt a modified version of option 1 as the most appropriate mechanism for determining when a fishery has met the ZMRG; modify option 1 by adding a second component that compels further reductions in mortality and serious injury for those stocks with high potential biological removal (PBR) levels; and determine that a fishery has met the ZMRG only if it results in a level of mortality and serious injury below the threshold established for that goal.	—	—
12 September 2003	Mr. Charlie R. Chandler, Division of Management Authority, U.S. Fish and Wildlife Service, on a permit application from Georgia Southern University to conduct scientific research on Florida manatees. Recommended approval with conditions.	23 November 2004	Permit issued. Commission recommendations adopted.

Date of MMC Letter	MMC Comments	Date of Agency Response	Agency Response
28 October 2003	William T. Hogarth, Ph.D., National Marine Fisheries Service, regarding the Service's proposed strategy for reducing the risk of collisions between ships and right whales. Recommended that the Service implement the dynamic area management measures on an expedited basis; use a two-tiered system for implementing vessel-related dynamic management areas; propose 12 knots as the maximum recommended speed for most areas where speed limits are necessary; propose a maximum speed of 12 knots for vessels operating in a managed area during the whale season and 10 knots if whales are sighted within a mile of the vessel in traffic lanes through the southeastern calving grounds and in Cape Cod Bay; and develop separate timetables for implementing the different measures because some of these can be implemented more quickly than others.	—	Advance notice of proposed rulemaking published 1 June 2004 requesting public comment on possible strategies to reduce ship strike risks. No further action taken at end of 2004.
17 November 2003	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit application from Sea World, Inc., to collect, receive, import/export, and analyze specimens from dead or captive cetaceans and pinnipeds for scientific research purposes. Recommended that the Service consider adopting a generic approach for authorizing the collection and use of specimen materials by institutions for eventual research purposes. Recommended that the requested permits be issued with conditions.	18 February 2004	Permit issued. Commission's recommendations adopted.

<b>Date of MMC Letter</b>	<b>MMC Comments</b>	<b>Date of Agency Response</b>	<b>Agency Response</b>
24 November 2003	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on joint permit application from the National Museum of Natural History to the National Marine Fisheries Service and the U.S. Fish and Wildlife Service for authorization to acquire, import, and export marine mammal specimen material. Recommended that the requested permit be approved with conditions.	5 February 2004	Permit issued for National Marine Fisheries Service species. Commission recommendation adopted.
		27 September 2004	Permit issued for Fish and Wildlife Service species. Commission recommendation adopted.
24 November 2003	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on joint permit application from Darla Ewalt to the National Marine Fisheries Service and the U.S. Fish and Wildlife Service for authorization to acquire, import, and export marine mammal specimen material. Recommended that the requested permits be approved with conditions.	30 January 2004	Joint NMFS/FWS permit issued. Commission recommendation adopted.

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25 November 2003	Mr. P. Michael Payne, Office of Protected Resources, National Marine Fisheries Service, regarding the draft 2003 stock assessment reports for marine mammals in the U.S. Atlantic, Pacific, and Alaska regions. Recommended that the Service work with the scientific review groups from each region and the Marine Mammal Commission to investigate means to update the data in the stock assessment reports in a more timely fashion, and to better coordinate the review process for the reports; develop a more systematic approach for reporting information on fisheries interactions based on consistent application of data standards for observer coverage and quantitative assessment of our ability to detect mortality and serious injury of marine mammals; review its interpretation of population parameters and status in the absence of adequate information, identify measures that can be used to convey the associated uncertainty, and incorporate those measures in the stock assessment reports; prepare stock assessment reports on prospective stocks, or at the least incorporate information on the applicable parameters in the current stock assessment report; use the stock assessment reports as a basis for an overall assessment of key issues/problems, and use that assessment to facilitate planning and setting of priorities for future research; and review and revise its approach for determining when right whales have been seriously injured.	—	—
25 November 2003	Mr. Stephen L. Leathery, Office of Protected Resources, National Marine Fisheries Service, on a permit amendment request from James Darling, Ph.D., to authorize the harassment of additional humpback whales under the permit. Recommended approval with conditions.	30 June 2004	Permit issued. Commission's recommendations adopted.

<b>Date of MMC Letter</b>	<b>MMC Comments</b>	<b>Date of Agency Response</b>	<b>Agency Response</b>
5 December 2003	Ms. Mary Colligan, Northeast Regional Office, National Marine Fisheries Service, regarding the Service’s determination that action on a petition to revise the current critical habitat boundaries for North Atlantic right whales “is not warranted at this time.” Recommended that the Service conduct the analyses necessary to identify how the existing critical habitat areas should be modified based on the available information already in hand and proceed with modifying the designated right whale critical habitat boundaries based on that analysis as quickly as possible.	30 December 2003	Response that NOAA Fisheries is currently investigating the nature and location of physical and biological features essential to the conservation of right whales and will evaluate new information including recent right whale sighting reports, to determine whether a proposed rule to revise critical habitat is appropriate. If so, NOAA Fisheries will issue a proposed rule consistent with the requirements, purposes, and policies of the Endangered Species Act.
18 December 2003	Mr. P. Michael Payne, Office of Protected Resources, National Marine Fisheries Service, regarding the application submitted by Lamont-Doherty Earth Observatory seeking authorization to take small numbers of marine mammals by harassment incidental to conducting oceanographic seismic surveys in the southeastern Caribbean Sea and adjacent Atlantic Ocean. Reiterated previous recommendations on similar requests that, before issuing the requested authorization, the Service ensure that the planned monitoring program is sufficient to detect with reasonable accuracy marine mammals within and entering the identified safety zones. Recommended that the Service: consult with the applicant about incorporating a marine mammal research component into future operations to develop data on the effectiveness of ramping up the sound source and on the avoidance behavior of marine mammals once peak pressure levels have been attained; consider requiring the applicant to augment the proposed observer program with passive or active acoustic monitoring; require that postsurvey monitoring be conducted as part of any small-take authorization for the proposed survey.	20 February 2004	Responded that the Commission’s letter raised several issues that need to be addressed for each of the incidental harassment authorizations that have been issued to Lamont-Doherty Earth Observatory and others. Noted that some of these issues will be addressed in more detail in the Federal Register notice describing the Service’s decision on whether to issue an incidental harassment authorization to the applicant for the southeastern Caribbean cruise. Noted generally that Lamont-Doherty has committed to conducting passive acoustic monitoring during the southeastern Caribbean seismic cruise. Although such monitoring does not provide a distance that the vocalizing mammal might be from the seismic vessel, it can be used as a cue as to the presence of an animal. Regarding postsurvey monitoring, Lamont-Doherty does not permit the R/V Seward Johnson II to follow behind the R/V Maurice Ewing on all coincident profiles.

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22 December 2003	<p>Mr. P. Michael Payne, Office of Protected Resources, National Marine Fisheries Service, regarding an application from the 30th Space Wing, U.S. Air Force, seeking authorization to harass small numbers of pinnipeds incidental to space vehicle and test flight activities from Vandenberg Air Force Base, California, from 1 January 2004 through 31 December 2008, and the Service's proposal to issue regulations to govern that take. Recommended that the proposed rule be issued provided that (1) the mitigation and monitoring activities described in the Services's Federal Register notice and the application are incorporated into the rule; (2) acoustic and biological monitoring be conducted on new space and military launch vehicles during at least the first launch and during the first three launches of the Atlas V and Delta IF space launch vehicles, whether or not the launches occur during the harbor seal pupping season; (3) continuation of the research program being carried out under scientific research permit no. 859-1680 is made a condition of the rule; and (4) the authorized activities be suspended, pending review, if there are any indications that the activities covered by the rule may be causing marine mammal mortalities or injuries or are affecting the distribution, size, or productivity of the potentially affected populations.</p>	—	—

<b>Date of MMC Letter</b>	<b>MMC Comments</b>	<b>Date of Agency Response</b>	<b>Agency Response</b>
31 December 2003	<p>Mr. P. Michael Payne, Office of Protected Resources, National Marine Fisheries Service, regarding measures for reducing marine mammal mortality and serious injury from direct fishery interactions, specifically with regard to mid-Atlantic bottlenose dolphins and North Atlantic right whales. Recommended continued investigation of bottlenose dolphin stock structure in the mid-Atlantic region; continued surveys of mid-Atlantic bottlenose dolphins to confirm recent estimates of abundance and investigate bias from overlapping distributions of coastal and offshore ecotypes; additional assessment of inshore dolphins to estimate abundance and fishery-related mortality and serious injury; development of standards for acceptable accuracy and precision of estimates of abundance and, particularly, mortality/serious injury, and development of alternative assessment methods when observer programs do not provide reasonably precise estimates of mortality/serious injury; review and improvement of coordination of fishery management efforts with conservation and take-reduction efforts to ensure that fisheries managers assume responsibility for adopting measures to regulate fishing in ways that provide needed protection for marine mammals; and a fundamental change in the management strategy for reducing entanglement-related mortality and serious injury of North Atlantic right whales. Recommended that the Service immediately convene a scientific review team composed of experts in marine mammal conservation, fisheries management, and ecosystem management to develop medium-term and long-term strategies to address fundamental changes in managing fishery interactions with the North Atlantic right whale.</p>	29 January 2004	<p>Responded by noting various steps that the Service is taking to improve information on bottlenose dolphin stock structure, abundance estimation, accuracy and precision of abundance and mortality estimates, and coordination with fishery management programs. Responded that the idea of establishing a scientific review group, separate from the Atlantic Large Whale Take Reduction Team, to develop strategies for right whale conservation merits further discussion. Noted that it could potentially create confusion with regard to the role of such a group and the team; however, the Service is interested in discussing the issue further with the Commission.</p>

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31 December 2003	Ms. Laurie K. Allen, Office of Protected Resources, National Marine Fisheries Service, regarding the need to review and revise the Service’s application instructions for scientific research and enhancement permits. Recommended that the Service revise its application instructions for scientific research and enhancement permits.	—	—
31 December 2003	Ms. Laurie K. Allen, Office of Protected Resources, National Marine Fisheries Service, regarding the lengthy and overly burdensome process required to obtain a scientific research permit. Recommended that the National Marine Fisheries Service and the U.S. Fish and Wildlife Service develop ways to better coordinate analyses of applications under the Marine Mammal Protection Act, the Endangered Species Act, and the National Environmental Policy Act. Recommended that the National Marine Fisheries Service explore options for better coordinating and consolidating application processing under the multiple statutes; evaluate and, as necessary, restructure the current system for conducting permit-related consultations under the Endangered Species Act; develop measures to hasten the preparation of programmatic assessments under the National Environmental Policy Act, either in-house or through contractors; review application instructions for scientific research permits and enhancement permits under the Marine Mammal Protection Act and the Endangered Species Act; and consider ways to free staff to work on scientific research issues.	—	—

<b>Date of MMC Letter</b>	<b>MMC Comments</b>	<b>Date of Agency Response</b>	<b>Agency Response</b>
31 December 2003	William T. Hogarth, Ph.D., National Marine Fisheries Service, regarding the Marine Mammal Health and Stranding Response Program. Requesting a meeting with staff involved in the program to explore in detail the potential costs and benefits associated with conducting a review of the Marine Mammal Health and Stranding Response Program.	—	—

## Monk Seals

The Hawaiian monk seal is the most endangered pinniped in US waters. Its conservation poses a challenge not only with regard to the species' recovery but also to the recovery and maintenance of healthy marine ecosystems throughout the Hawaiian Archipelago.



## Spinner Dolphins

Spinner dolphins, known for their aerial acrobatics, have so captured the imagination of marine tourists that they have become vulnerable to the excesses of our attention.

