

CHAPTER 20:**PROTECTING MARINE MAMMALS
AND ENDANGERED MARINE SPECIES**

Protection for marine mammals and endangered or threatened species from direct impacts has increased since the enactment of the Marine Mammal Protection Act in 1972 and the Endangered Species Act in 1973. However, lack of scientific data, confusion about permitting requirements, and failure to adopt a more ecosystem-based management approach have created inconsistent and inefficient protection efforts, particularly from indirect and cumulative impacts. Consolidating and coordinating federal jurisdictional authorities, clarifying permitting and review requirements for activities that may impact marine mammals and endangered or threatened species, increasing scientific research and public education, and actively pursuing international measures to protect these species are all improvements that will promote better stewardship of marine mammals, endangered or threatened species, and the marine ecosystem.

ASSESSING THE THREATS TO MARINE POPULATIONS

Because of their intelligence, visibility and frequent interactions with humans, marine mammals hold a special place in the minds of most people. Little wonder, then, that mammals are afforded a higher level of protection than fish or other marine organisms. They are, however, affected and harmed by a wide range of human activities.

The biggest threat to marine mammals worldwide today is their accidental capture or entanglement in fishing gear (known as “bycatch”), killing hundreds of thousands of animals a year.¹ Dolphins, porpoises and small whales often drown when tangled in a net or a fishing line because they are not able to surface for air. Even large whales can become entangled and tow nets or other gear for long periods, leading to the mammal’s injury, exhaustion, or death. (These issues are also discussed in Chapter 18 on marine debris and Chapter 19 on fisheries management.)

Historically, commercial harvesting contributed to major declines in the populations of marine mammals but only a few nations still allow hunting for purposes other than subsistence. Hunters from those nations continue to kill hundreds of thousands of whales, dolphins, and other marine mammals each year while legal subsistence hunting accounts for thousands more.

Like pedestrians in the city, marine mammals are vulnerable to ship traffic at sea, especially in areas crowded by commercial and recreational vessels. North Atlantic right whales are particularly susceptible to collisions with vessels in busy East Coast corridors, while manatees are frequently struck by boats in shallow waters near Florida. Several hundred animals are wounded or killed by such interactions every year.

Other possible causes of mortality include the indirect effects of climate change, introduction of new diseases, and ecosystem changes such as algal blooms. These factors may cause several thousand additional deaths each year.

Although pollution rarely kills marine creatures immediately, it can impair their health, harm their reproductive potential, and eventually lead to their death. Chemicals in fertilizers, pesticides, pharmaceuticals, and other materials can accumulate in the tissues of these animals, especially those with long life spans, such as sea turtles. Ingestion of ocean debris and entanglement in plastic trash are additional dangers for marine mammals, sea turtles, and sea birds.

Marine mammal populations may also be disturbed by noise from shipping, oil and gas exploration, ocean drilling, naval operations, oceanographic and geophysical research, and similar activities. In the last ten years, considerable publicity has surrounded the deaths of marine mammals in close proximity to U.S. naval operations and geophysical research vessels. Unfortunately, very little is known about marine mammal hearing, making it difficult to assess the potential bio-physical impacts of noise on marine animals.

The threats to endangered marine species such as sea turtles and sea birds are myriad and not easily categorized. One factor that is common to declines in many species is the destruction or degradation of their natural habitat. Thus the successful recovery of a species depends to a large degree on protection or restoration of this habitat.

REVIEWING AUTHORITIES AND RESPONSIBILITIES

The early 1970s witnessed the passage of several landmark environmental laws in the United States. Many of these statutes affected marine mammals and other protected species indirectly, but two were focused specifically on the conservation and protection of these animals.

The Marine Mammal Protection Act

The 1972 Marine Mammal Protection Act (MMPA) was passed by Congress in response to public concerns about the incidental deaths of hundreds of thousands of dolphins each year associated with tuna fisheries, the hunting of seals for fur, and the continuing commercial harvest of whales despite controls by the International Whaling Commission. The MMPA, with limited exceptions, prohibits the hunting, killing, or harassment of marine mammals.

The MMPA divides federal jurisdiction over marine mammals between two agencies. The National Oceanic and Atmospheric Administration's (NOAA's) National Marine Fisheries Service (NMFS) manages the vast majority of marine mammals, including whales, dolphins, porpoises, seals, and sea lions. The U.S. Department of the Interior's (DOI's) U.S. Fish and Wildlife Service (USFWS) manages five species: polar bears, walrus, sea otters, manatees, and dugongs.

The MMPA also established the independent Marine Mammal Commission (MMC). The MMC 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. It also manages and funds a research program to support management activities. Although the Commission's independence has been essential to its functioning, creation of the National Ocean Council will provide it with a venue to coordinate with other federal agencies involved in marine mammal research and management. According to the MMC, most marine mammal stocks in U.S. waters, and many others around the world, are in better condition now than before passage of the MMPA.²

Recommendation 20–1. Congress should amend the Marine Mammal Protection Act to require the Marine Mammal Commission to coordinate with all the relevant federal agencies through the National Ocean Council (NOC) while remaining independent. The NOC should consider whether there is a need for similar oversight bodies for other marine animals whose populations are at risk.

The Endangered Species Act

In 1973, the Endangered Species Act (ESA) was enacted to conserve endangered and threatened species and the ecosystems upon which they depend. The new law vastly strengthened earlier measures directed at the same problem. The public was broadly supportive of the Act due to the well-publicized declines of well-known species such as the bald eagle. A 1999 public opinion survey indicated that public support for the protection of biodiversity continues.³

Under the ESA, the federal government is responsible for listing species as “endangered” or “threatened” based on population size and trends. This responsibility is divided between the USFWS, primarily responsible for terrestrial organisms, and NMFS, primarily responsible for marine and anadromous species. The law includes powerful prohibitions against any action that harms a listed animal. The law, with limited exceptions, prohibits federal agencies from authorizing, funding, or carrying out any action that would jeopardize a member of a listed species or destroy its critical habitat and requires them to undertake conservation programs. To promote state action, matching federal funds were authorized for states willing to enter into approved cooperative agreements.

Currently, there are 1,509 species listed as endangered and 345 species listed as threatened by USFWS, while NMFS has listed 19 species as endangered and 12 as threatened. It is impossible to precisely quantify the overall biological impact of the ESA. However, a 1995 National Research Council (NRC) report concluded that the ESA has successfully prevented species from becoming extinct.⁴ The rigorous provisions of the ESA work as a safety net to help species survive once they have declined to the level that listing is warranted. Because of this, the NRC did not recommend wholesale changes to ESA implementation. It did, however, point out that the ESA has been less effective in preventing species from declining to levels that require listing in the first place.

The NRC also observed that, although one purpose of the ESA is to conserve ecosystems, the Act itself includes little specific guidance in this area. To fix this, the NRC recommended a focus on broader rehabilitation of ecosystem functions, as part of a move toward ecosystem-based management. Maintaining healthy, functioning ecosystems can help prevent species from becoming threatened or endangered and avoid some of the economic disruption that results when drastic measures must be taken to protect an endangered species. The NRC report also concluded that the federal focus of the ESA should be broadened to include other layers of government and nongovernmental interests as well. Of course, humans themselves are part of the ecosystem and comprehensive management plans should account for both species conservation and human uses.

IDENTIFYING AND OVERCOMING GAPS IN PROTECTION

Several changes are needed in federal law to enhance marine mammal and endangered species protection. The split of management jurisdiction between two federal agencies, confusion over the requirements of permit applications and approvals, and the lack of clarity in the definition of legal terms are all issues that should be addressed.

Jurisdictional Confusion

As noted, the management of marine mammals and endangered species is currently divided between NMFS and USFWS. In the case of marine mammals, this split was intended to be temporary and makes little sense. In the case of endangered species, the split is more logical, but better coordination and clarity are still needed.

The original congressional committee reports that accompanied the MMPA in 1972 show that Congress did not intend marine mammal jurisdiction to be permanently divided between NOAA and USFWS.^{5,6} Rather, House and Senate committees anticipated the creation of a new Department of Natural Resources that would combine NOAA and USFWS. The report stated that if the proposed new department did not become a reality, they would reexamine the question of jurisdiction and consider placing the entire marine mammal program within a single department. Nevertheless, the jurisdictional split remains today.

The division of endangered species jurisdiction appears reasonable because of the expertise of each agency: NMFS has jurisdiction over marine and anadromous species and DOI has jurisdiction over terrestrial and freshwater species. But ecosystems do not recognize these distinctions. When some species of salmon were listed under the ESA in the 1980s and 1990s, most of the causes for their decline were land-based or freshwater in origin, requiring significant coordination between NMFS and USFWS, as well as other agencies. This coordination has not been entirely effective and improved oversight of the relationship between NMFS and USFWS is needed to clarify areas of responsibility and reduce conflicts.

Recommendation 20–2. Congress should amend the Marine Mammal Protection Act to place the protection of all marine mammals within the jurisdiction of the National Oceanic and Atmospheric Administration.

Recommendation 20–3. The National Ocean Council should improve coordination between the National Marine Fisheries Service and U.S. Fish and Wildlife Service with respect to the implementation of the Endangered Species Act, particularly for anadromous species or when land-based activities have significant impacts on marine species.

Unclear Permitting and Review Standards

A *take* is a term used in the MMPA and ESA to define an activity that results in the death or injury of a marine mammal or a member of an endangered species. After much litigation and scrutiny, the interpretation of this term under the ESA appears fairly clear to both managers and the public. This is not the case for the MMPA.

The MMPA prohibits the taking or importation of marine mammals and marine mammal products unless that action falls under one of the law’s exemptions, such as a taking for the purpose of education, conservation, or scientific research. Exemptions are also allowed for Native Alaskans, who may take marine mammals for subsistence or for creating authentic native handicrafts and clothing.

Outside these narrow exemptions, the MMPA authorizes the issuance of permits for the unintentional and incidental taking of small numbers of marine mammals provided it has only a negligible impact on the species. This provision has been problematic because terms such as *small numbers* and *negligible impact* are not defined in the Act, resulting in a lack of clarity about when a permit is necessary and under what circumstances it should be granted.

Recommendation 20–4. Congress should amend the Marine Mammal Protection Act to require the National Oceanic and Atmospheric Administration to more clearly specify categories of activities that are allowed without a permit, those that require a permit, and those that are prohibited.

The Meaning of Harassment

Under the MMPA, the term *harassment* is an essential element in determining whether a small-take permit can be granted. Amendments to the Act in 1994 split the definition of harassment into two categories. Harassment is currently defined in law as any act of pursuit, torment, or annoyance that:

- has the potential to injure a marine mammal or marine mammal stock in the wild (level A harassment), or
- has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (level B harassment).

The apparent intent of this definition was to distinguish activities likely to have significant effects from activities such as marine mammal research that, although perceptible to the animals, are not likely to result in significant disturbance. However, NOAA and USFWS have had difficulties implementing the 1994 definition which has led to public uncertainty with respect to its implications. The lack of clarity means that almost any commercial, recreational, or scientific activity that is noticed by a marine mammal might be defined as harassment. Paradoxically, this uncertainty has provided *less* protection; neither agency has ever brought an enforcement case under the new definition. In fact, both agencies argue that the confusion limits their ability to regulate even potentially harmful activities.

A 2000 National Research Council report concluded that the intent of the MMPA was not to regulate activities that result in minor changes in behavior.⁷ The report recommended that level B harassment be redefined to focus on “meaningful disruptions to biologically significant activities.” Another National Research Council study currently underway is investigating what behaviors should be considered biologically significant and what research might be needed to implement the revised definition.

Recommendation 20–5. Congress should amend the Marine Mammal Protection Act to revise the definition of harassment to cover only activities that meaningfully disrupt behaviors that are significant to the survival and reproduction of marine mammals.

The Promise of Programmatic Permitting

In spite of the confusion about MMPA wording, NMFS and USFWS have had to issue regulations and make case-by-case decisions on permit and authorization applications. Considerable deference has been given to the professional judgment of agency personnel regarding which activities are permissible. Both agencies have qualified and dedicated people reviewing applications, but the process is necessarily subjective and a personnel change can mean the difference between approval and denial of similar permits. This case-by-case decision making has led to inconsistencies, a lack of clear standards, and uncertain protection for marine mammals.

Most permit applications are processed according to the same procedures, regardless of the level of potential harm to marine mammals. As a result, limited agency resources can be wasted reviewing relatively insignificant permit applications, while insufficient attention is paid to more worrisome activities. A shift to programmatic permitting would enable more proactive and efficient handling of the bulk of permit applications, while reducing the costs and burdens on agency personnel.

Programmatic permitting would allow for quick approval of activities on a defined list, specifying broad parameters within which those activities could occur. A programmatic permit could also include required mitigation and data collection measures, such as requiring that whale-watching boats keep at a certain distance from the animals and maintain records of species observed and their locations.

In addition to streamlining permitting, clear and consistent enforcement is needed to ensure compliance with permit conditions, and penalties must be stiff enough to discourage anyone tempted to disregard those conditions.

Recommendation 20–6. The National Marine Fisheries Service and the U.S. Fish and Wildlife Service should implement programmatic permitting for activities that affect marine mammals, wherever possible. More resource intensive case-by-case permitting should be reserved for unique activities or where circumstances indicate a greater likelihood of harm to marine mammals. The National Ocean Council should create an interagency team to recommend activities appropriate for programmatic permitting, those that are inappropriate, and those that are potentially appropriate pending additional scientific information. Enforcement efforts should also be strengthened and the adequacy of penalties reviewed.

To carry this out:

- *the interagency team should include representatives from the National Oceanic and Atmospheric Administration, National Science Foundation, U.S. Army Corps of Engineers, Minerals Management Service, and U.S. Navy, with input from the Marine Mammal Commission.*
- *programmatic permits should be subject to periodic review, be updated to incorporate the best available science, and remain valid for a limited time to ensure that current permittees are bound by any changes.*

While programmatic permitting would reduce much of the uncertainty about whether a permit is required, some cases will continue to be unclear. Potential permittees should approach the regulatory agencies as soon as a question arises about possible interactions with marine mammals. In particular, the potential impacts of new ocean technologies on marine mammals should be considered and the permit application process started early in the developmental stages.

Communication must also be improved so that permitting agencies have sufficient time and resources to meet their responsibilities while the action agency or permit applicant can be sure that decisions will be made in a confidential, timely and consistent manner. This has been a particular problem in the past with regard to naval exercises and oceanographic research activities.

EXPANDING RESEARCH AND EDUCATION

Although much more is known about marine animals today than even a decade ago, scientists still do not understand the life history or physiology of most marine mammal species. Because the decline of such populations tends to be caused by multiple environmental factors, enhanced research on a range of subjects is necessary to find ways to reduce the harmful effects of human activities and to implement effective ecosystem-based management plans.

Understanding Behavior and Human Impacts

Minimizing disruptions to the most important life stages of marine mammals will aid in their survival. To maximize reproductive rates in declining populations, more needs to be learned about breeding grounds and essential habitat. If information were available that showed a particular species could benefit from higher levels of protection during times of mating or birth, management practices could evolve accordingly. Actions could include temporarily closing fisheries that overlap with these activities or requiring vessel traffic to slow down or avoid critical areas. Knowledge of migration patterns and feeding locations is also critical to maintaining healthy populations.

While many human activities can harm individual marine animals, the extent to which humans affect the long-term status of protected species is poorly understood. Coastal development, offshore oil and gas exploration, vessel traffic, military activities, and marine debris all have the potential to threaten protected populations. Understanding the danger of these activities relative to bycatch, hunting, and natural predation is critical to focus attention, research, and enforcement efforts where it is most needed.

Point and nonpoint source pollution threaten the health of all ocean organisms. Much more study is needed about the effects of contaminants, especially on marine mammals' immune functions, and the possible results of exposure to human pathogens and toxic algal blooms. In addition, the differing impacts of chronic versus acute exposures need to be measured—long-term exposure to relatively low levels of some pollutants may be more damaging to a population's continued success than a single, high-impact event.

Increased research into the biological, chemical, and psychological stresses to marine mammal and other protected species populations will allow for more comprehensive, ecosystem-based management. Furthermore, for activities where interaction with protected populations is likely and unavoidable, better scientific data will lead to more effective permitting procedures.

Recommendation 20–7. The National Oceanic and Atmospheric Administration and the U.S. Department of the Interior should promote an expanded research, technology, and engineering program, coordinated through the National Ocean Council, to examine and mitigate the effects of human activities on marine mammals and endangered species.

Effects of Noise on Marine Mammals

One particular area that requires better understanding is the effect of sound on marine mammals. Many marine mammals use sound to communicate, navigate, feed, and sense their surroundings. These natural behaviors can be disrupted when other sounds interfere. In the ocean, sound emanates from a variety of sources, both natural (e.g., storms, volcanic eruptions, and earthquakes) and human-generated (e.g., shipping, scientific and commercial surveys, and commercial and military sonar).

Scientists know relatively little about the biological, psychological, and behavioral changes in marine mammals that are caused by human-generated sound. Activities such as commercial shipping, construction, geological exploration, and sonar certainly can produce noises intense enough to elicit reactions from marine mammals. However, due to the complexity of the biological and physical interactions being studied, and the difficulty of conducting studies on marine mammals, many important questions remain unanswered.⁸ For example, the scientific community currently understands very little about marine mammal hearing and how these animals react to sound. It is not known whether health and behavioral problems will arise only from acute exposures to very loud sound, or whether chronic exposure to lower-intensity sounds (such as passing ship traffic) may also result in long-term effects.

Currently, the U.S. Navy and, to a lesser extent, the Minerals Management Service, are the only federal agencies with significant marine mammal acoustic research programs, including studies to examine the impact of noise on marine mammals. Expanded research efforts and data dissemination are needed to understand marine mammal interactions with sound and reduce or prevent the negative impacts of human-generated noise on these animals.

Recommendation 20–8. Congress should expand federal funding for research into ocean acoustics and the potential impacts of noise on marine mammals. This funding should be distributed across several agencies, including the National Science Foundation, U.S. Geological Survey, and Minerals Management Service, to decrease the reliance on U.S. Navy research in this area. The research programs should be well coordinated across the government and examine a range of issues relating to noise generated by scientific, commercial, and operational activities.

Public Education and Outreach

The general public increasingly has opportunities to come into contact with marine mammals through diving, aquarium shows, and similar activities. These interactions can increase public awareness and sensitivity about the needs and vulnerabilities of these animals and how human activities can affect them. Aquariums and other marine mammal exhibitors can also showcase how larger environmental issues affect marine mammals and the ecosystems on which they rely.

While human contact with marine mammals raises public awareness, there is also growing concern about activities such as feeding programs, whale-watching excursions, and facilities that allow humans to swim with captive dolphins. For example, feeding programs in the open ocean, most prevalent in Florida and Hawaii, can disrupt natural behaviors and expose animals to harm by decreasing their natural fear of humans.⁹ Education programs should point out the harm that too much human interaction with marine mammals can inadvertently cause.

APPLYING ECOSYSTEM-BASED MANAGEMENT PRINCIPLES

The purpose of ecosystem-based management approaches is to recognize the full nature of ocean and coastal systems and to allow for better coordination of management actions, reduce duplication and conflicts, and take full advantage of available resources. As they are implemented, ecosystem-based management practices can enhance the protection of marine mammals and endangered species.

Domestic Action

The MMPA and ESA currently provide powerful statutory and regulatory tools to address direct impacts to marine mammals and endangered species. However, mechanisms are not in place for handling broad, long-term threats and concerns. The basic tenets of ecosystem-based management require an assessment of all important components and processes in a system, and evaluation of all potential threats. Improved scientific assessments will allow managers to create ecosystem-based management plans, an essential part of which would describe threats to marine mammals and other protected species. Once an ecosystem is analyzed, managers can prioritize protection efforts, addressing the most critical risks first.

For marine mammals, hunting and fisheries bycatch would be at the top of the list; for endangered species, habitat destruction would be a likely focus. Unfortunately, attention has centered instead on high-profile lower impact issues, such as the possible effect of ocean noise on marine mammals. Part of the explanation for the misdirected focus is the huge disparity between what we know about the biology and ecology of marine species and what remains to be learned. In particular, the lack of baseline data on marine mammal biology coupled with limited stock assessment data make it difficult to evaluate population abundance and trends or distinguish management successes and failures.

The listing of several salmon species as endangered and threatened shows both the promise and the difficulty of moving toward an ecosystem-based management approach. The threat of large-scale economic disruptions in the Pacific Northwest has led many state, local, and tribal entities to push for a more collaborative, ecosystem-based management approach to avoid severe federal sanctions under the ESA. However, initial results have shown that the federal government needs to do a better job of supporting and encouraging these efforts. Recommendations in Chapter 3 on ecosystem-based management and in Chapter 5 on the benefits of a regional approach should help.

International Coordination

Expanding the concept of ecosystem-based management to its logical conclusion will require us to address impacts that occur beyond U.S. waters. For many of the marine species discussed in this chapter, the

ecosystem in which they live encompasses the high seas and also the waters of many other countries around the world. In order to address impacts to these species throughout their ecosystem, the United States will need to use international agreements and other diplomatic means to strengthen protections for species beyond our own waters. For example, the development of bycatch reduction methods for U.S. fishermen should be complemented by efforts to get foreign fishermen to implement similar methods. This comprehensive approach makes sense from a conservation perspective and creates a more level playing field for U.S. and foreign fishermen. The U.S. Department of State, working with NOAA and DOI, should continue to actively pursue efforts to reduce the impacts of human activities on marine species at risk in international and foreign waters.

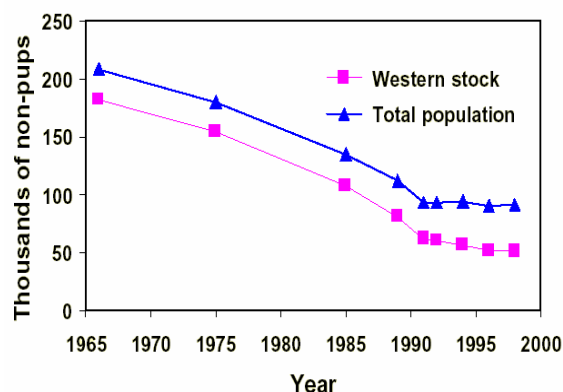
Making a Case for Ecosystem-based Management: The Steller Sea Lion

The story of the Steller sea lion illustrates the conflicts that can arise between human activities and protection of marine mammals. The Steller sea lion is the largest of the sea lions and is found along coastal areas of the northern Pacific Rim. Its primary sources of food are groundfish, including pollock and mackerel, and cephalopods, including octopus and squid. Since the mid-1970s, the western population near Alaska has declined by about 85 percent (Figure 20.1).¹⁰ Analyses indicate that the decline may be due in part to environmental changes, legal and illegal hunting, predation by killer whales, competition with fishermen for food, and incidental catch in fisheries. A 2003 report by the National Research Council found that none of these causes could be ruled out and called for scientifically-designed adaptive management experiments to find out more.¹¹

Under the Marine Mammal Protection Act, the national Marine Fisheries Service (NMFS) is responsible for managing Steller sea lions. It is also the agency responsible for management of Alaskan fisheries, resulting in potential statutory conflicts. In 1991, a number of environmental groups sued NMFS for failing to take into account the potential role of Alaskan fisheries in the decline of the Steller sea lion. After years of litigation, the problem has yet to be resolved to the satisfaction of any of the litigants. In addition, Steller sea lions were listed under the Endangered Species Act (the western population as endangered and the eastern as threatened) adding that statute's requirements to the mix.

The continued decline of the Steller sea lion population highlights the importance of moving toward an ecosystem-based management approach, where such factors as predators, quality and quantity of food, essential habitat, and incidental catch are all weighed when deciding the best course of action for protection of a species. In addition, a more ecosystem-based focus would have identified the problem much more quickly, enabling managers and scientists to develop a more comprehensive and timely research strategy to determine the various causes of the decline and develop a management regime to address the problems. Instead, the situation was allowed to reach a crisis stage, requiring emergency measures.

Figure 20.1. Sea Lion Populations in Danger



Even though Steller sea lions have been protected since the early 1970s, the Alaskan populations of animals over one year old (non-pups) have continued to decline, particularly those located along the Aleutian Islands. This decline cannot be traced to a single cause, underscoring the need for an ecosystem-based approach to protect these animals.

Source: National Oceanic and Atmospheric Administration.
 <<http://stellersealions.noaa.gov/>> (Accessed January, 2004).

¹ World Wildlife Fund. *Reducing Global Cetacean Bycatch: A Call to Action*. Washington, DC, 2002.

² Marine Mammal Commission. *Annual Report to Congress*. Washington, DC, 2002.

³ Czech, B., and P.R. Krausman. "Public Opinion on Species and Endangered Species Conservation." *Endangered Species Update* 14, nos. 5 and 6 (1997): 7–10.

⁴ National Research Council. *Science and the Endangered Species Act*. Washington, DC: National Academy Press, 1995.

⁵ U.S. Congress. House of Representatives. Committee on Merchant Marine and Fisheries. 92nd Cong. S. Rept. 92-863.

⁶ U.S. Congress. Senate. Committee on Commerce, Science, and Transportation. 92nd Cong. H. Rept. 92-707.

⁷ National Research Council. *Marine Mammals and Low-Frequency Sound, Progress Since 1994*. Washington, DC: National Academy Press, 2000.

⁸ *Ibid.*

⁹ Spradlin, T.R., et al. "Interactions between the Public and Wild Dolphins in the United States: Biological Concerns and the Marine Mammal Protection Act." Presented at the 13th Biennial Conference on the Biology of Marine Mammals. Maui, HI, November 1999.

¹⁰ Marine Mammal Commission. *Annual Report to Congress*. Washington, DC, 2002.

¹¹ National Research Council. *The Decline of the Steller Sea Lion in Alaskan Waters: Untangling Food Webs and Fishing Nets*. Washington, DC: National Academy Press, 2003.