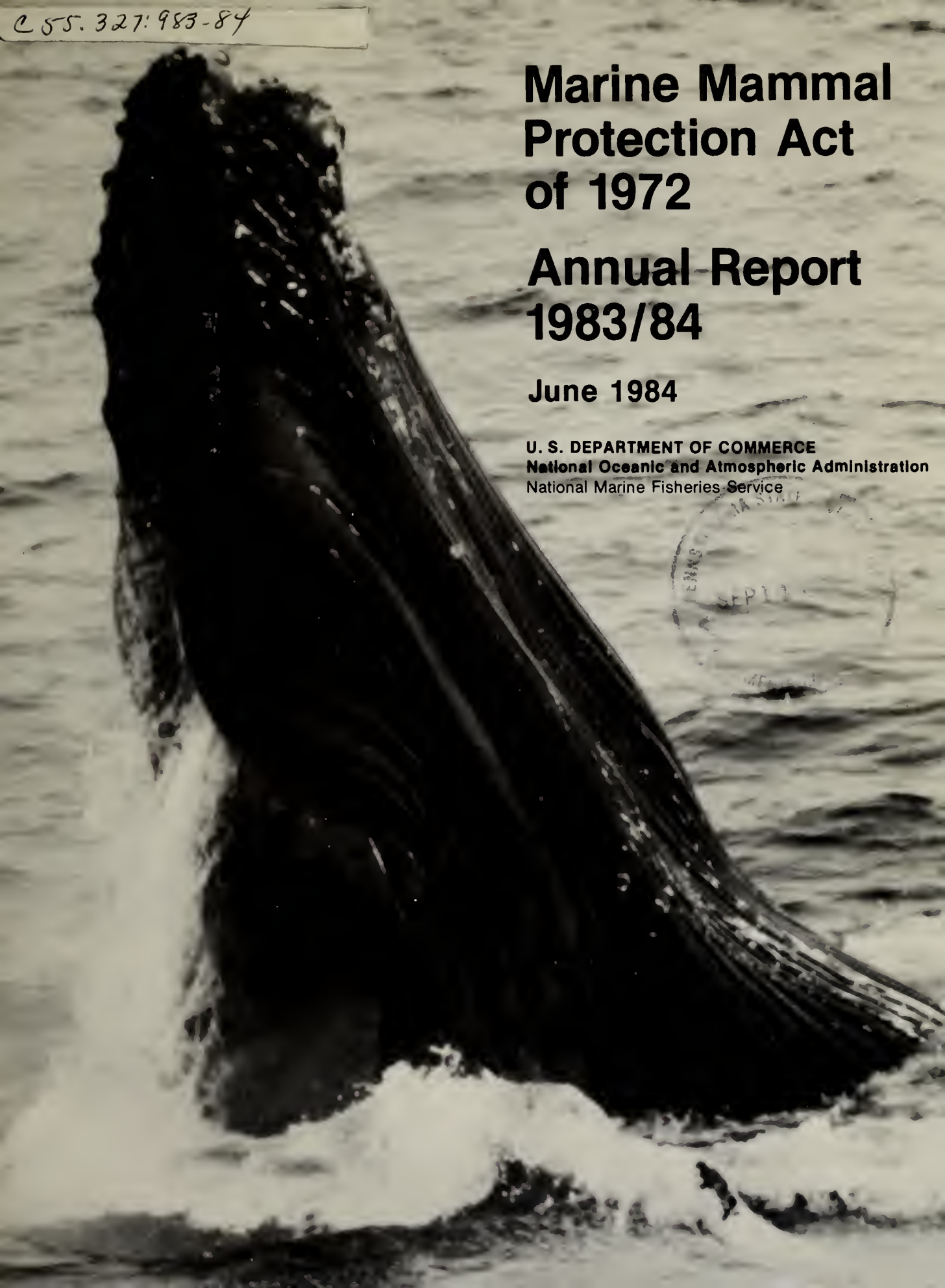


Marine Mammal Protection Act of 1972

Annual Report 1983/84

June 1984

U. S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

Cover photograph of humpback whale by
Mason Weinrich, Cetacean Research Unit,
Gloucester Fisherman's Museum,
Gloucester, Mass.

Marine Mammal Protection Act of 1972 Annual Report

April 1, 1983 to March 31, 1984

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, Secretary

National Oceanic and Atmospheric Administration
John V. Byrne, Administrator

National Marine Fisheries Service
William G. Gordon, Assistant Administrator

THE SECRETARY OF COMMERCE
Washington, D.C. 20230

JUN 25 1984

President of the Senate
Speaker of the House of Representatives

Sirs:

I am pleased to submit the Annual Report of the Department of Commerce regarding the administration of the Marine Mammal Protection Act of 1972 for the period April 1, 1983 through March 31, 1984, as required by Section 103(f) of the Act.

The Department of Commerce is responsible for implementing the Act with respect to whales and porpoises of the order Cetacea and seals and sea lions of the suborder Pinnipedia. The report details the activities of the Department regarding these marine mammals.

Sincerely,

Malcolm Baldrige

Secretary of Commerce

Enclosure

CONTENTS

Northern elephant seal yearling. Photo by Dana J. Seagars, Southwest Region, NMFS.

INTRODUCTION

Since 1972, when the Congress enacted the Marine Mammal Protection Act (MMPA or the Act), the United States has been committed to long-term management and research programs to conserve and protect these animals. With few exceptions, the Act placed a moratorium on taking or importing marine mammals or their products into the United States, and it applies to persons subject to U.S. jurisdiction on the high seas. In 1976, the Magnuson Fishery Conservation and Management Act (MFCMA) expanded U.S. control of marine mammals to include the 200-mile fishery conservation zone (FCZ).

The Act delegates authority and responsibility for oceanic marine mammals to the Secretary of the Agency where the National Oceanic and Atmospheric Administration (NOAA) operates. Under NOAA, the National Marine Fisheries Service (NMFS) is responsible for species of the order Cetacea, whales and dolphins, and the order Carnivora, suborder Pinnipedia, seals and sea lions, except walruses. The Department of the Interior is responsible for the dugong, manatee, polar bear, sea otter, and walrus.

The moratorium does not apply to every marine mammal species. Those already managed under international agreements, such as the northern fur seal, are exempt as long as the agreements further the purposes of the Act. Under a permit system, marine mammals may be taken for

scientific research, public display, and incidental to commercial fishing. The 1981 amendments to the Act added two categories of "small take" to the moratorium exception. Further, certain natives of Alaska may take marine mammals for subsistence use and production of handicrafts. Although the Act made management of marine mammals a Federal Government responsibility, it provides for the return of their management to the States.

The National Marine Fisheries Service grants or denies requests for exemptions, issues permits, carries out research and management programs, enforces the Act, participates in international programs, and issues rules and regulations. To carry out its mission to conserve and protect marine mammals, NMFS cooperates with the States, conservation organizations, the public, other Federal agencies, the Marine Mammal Commission, and many constituent groups including scientific researchers and the public display community.

NMFS's marine mammal research programs are the responsibility of the Southwest Fisheries Center, La Jolla, Calif,; the Southeast Fisheries Center, Miami, Fla.; the Northeast Fisheries Center, Woods Hole, Mass.; and the National Marine Mammal Laboratory (NMML), Northwest and Alaska Fisheries Center, Seattle, Wash. Management programs are the responsibility of the Northeast Region, Gloucester, Mass.; the Southeast Region, St. Petersburg, Fla.; the Northwest Region, Seattle, Wash.; the Southwest Region, Terminal Island, Calif.; and the Alaska Region, Juneau, Ala.

This annual report to Congress is available from the Office of Protected Species and Habitat Conservation, National Marine Fisheries Service, Washington, D.C. 20235.

SUMMARY

The MMPA is one of the principal wildlife conservation and management Acts administered by the Department of Commerce and has been a key factor in the recovery of several marine mammal populations. Since a major concern of Congress, as evidenced in the Act, is the continued viability and health of populations of marine mammals in their ecosystems, NMFS has dedicated significant resources over the years to the study of marine mammal populations, life cycles and reproductive capacities to broaden our knowledge of these species. Research in support of current and anticipated management decisions forms the major portion of our marine mammal work.

At this time, scientists at our Southeast Fisheries Center are studying the populations of bottlenose dolphins along the Florida and Gulf coastal areas to update and revise, if necessary, the quotas for the take of these popular animals for scientific research and public display.

Researchers at our Southwest Fisheries Center are studying the population status of seals and sea lions along the California coast to assist that State in regaining authority to manage some of these populations. The Center also monitors the status of porpoise stocks in the eastern tropical Pacific to determine the effects of the tuna fishery on those stocks. In Hawaii, Center scientists continue to study the endangered Hawaiian monk seal, and, with the Southwest Regional Office, are implementing a recovery plan for this species. In November of this year, the Hawaii Laboratory will host a workshop to examine the problem of entanglement of marine mammals and other marine animals in ocean debris. This workshop, cosponsored by several agencies, including NMFS and the Marine Mammal Commission, will deal with entanglement issues on a global basis.

Scientists from our National Marine Mammal Laboratory at the Northwest and Alaska Fisheries Center have been able to refine estimates of the size of the bowhead whale population as a result of studies conducted in the Bering and Beaufort Seas. The population of this endangered whale, culturally important to Alaska Eskimos, is estimated to exceed 3,800 animals. As a result of presentations by U.S. scientists to its Scientific Committee, the International Whaling Commission continued to support the subsistence harvest of the bowhead by native Americans. The Laboratory is also studying the effects of entanglement with debris, especially discarded fishing gear, on the population of northern fur seals on the Pribilof Islands.

Since 1978, the National Marine Mammal Laboratory has been involved in a cooperative research program with the Japanese to study the incidental take of marine mammals, primarily Dall's porpoise, in the Japanese high seas gillnet fishery for salmon inside the U.S. fishery conservation zone. Each year, U.S. scientists have boarded the salmon mothership fleets to collect biological samples and data. Our scientists have consulted with Japanese scientists on improvements to fishing gear that minimize the incidental catch of marine mammals. Beginning this fishing season, the fleet will implement the best available improvements on a schedule set by the Congress in the 1982 amendments to the North Pacific Fisheries Act.

The Northwest Region and Northwest Fisheries Center have established a coordinated research and management program for cetaceans and pinnipeds in the Northwest Atlantic. A popular summer activity, whale watching, (especially humpbacks off Cape Cod), has prompted the Region to develop guidelines for whale watching in New England waters.

One of our most successful management programs is the system we have developed to issue and monitor permits to take marine mammals for scientific research and public display. We monitor through a computerized system more than 300 valid permits for taking marine mammals.

We also issue permits allowing the unavoidable taking of marine mammals by domestic and foreign fishermen during commercial fishing operations. General permits are issued to foreign fishing associations of nations whose governments have a governing international fishery agreement (GIFA) that allows them to fish in the U.S. FCZ. This year we have issued 21 general permits to foreign and domestic fishing associations.

The Act imposed a moratorium on any unregulated direct taking, and, as a result, marine mammals in certain areas have become numerous and bold in their interactions with fishermen and fishing gear. The most acute problems seem to involve seals and sea lions in several areas of Alaska, Washington, Oregon, and California. To determine the extent of this problem, NMFS implemented or supported a number of research efforts in cooperation with the States.

Law enforcement is an important aspect of our management program. The moratorium on taking marine mammals is enforced by special agents from NMFS and State agents under contract to NMFS. Over the years, most violations have involved the illegal importation of marine mammal parts or products as well as activities related to the incidental take of marine mammals in fisheries. In 1983, a District Court upheld the Agency's authority to seize dolphins on an in-transit shipment through the U.S. from Mexico to Canada and to fine the owners for illegal importation.

Until last year, NOAA maintained an observer program on tuna vessels to monitor compliance with rules prescribed in concert with the general permit issued in 1980. That program was challenged by members of the tuna industry in 1981 (Balelo v. Baldrige) on the grounds that NOAA lacks statutory and constitutional authority to require observers

aboard tuna vessels. When the plaintiff's position was upheld by the Court of Appeals in 1983, NMFS and the Inter-American Tropical Tuna Commission (IATTC) established an agreement to operate a voluntary observer program to obtain biological data on porpoises captured during seining and to provide estimates of mortality which NOAA uses to monitor the mortality quotas. In January of this year, the Ninth Circuit Court of Appeals reversed the decisions of the three-judge panel and the U.S. District Court for the Southern District of California which had invalidated the NOAA regulation requiring observers on tuna boats. This new decision lets NMFS require that observers be allowed on tuna vessels and to use data gathered by observers for enforcement purposes. Although this decision resolves one of the major issues facing NOAA in regulating the take of porpoise in the yellowfin tuna fishery, the tuna industry has stated its intention to seek review of the decision by the Supreme Court. NMFS has notified the tuna industry that we have resumed our observer program.

Four of our regions have developed Marine Mammal Stranding Networks. These networks include individuals and organizations that volunteer to cooperate with us and are authorized to collect specimens for scientific research and to record the event with the regional coordinator. Sick and injured animals are rehabilitated in voluntary centers. After rehabilitation, healthy animals are returned to the wild. Animals that cannot be returned to the wild have been used to satisfy requests for marine mammals to be used for scientific research or public display. For several years, the entire demand for California sea lions for public display has been met by using rehabilitated animals.

In 1981, the Congress made several changes to the Act which we began to implement the following year. NMFS has issued final directives covering small, unintentional takings of non-depleted marine mammals incidental to commercial fishing and other activities. A five-year waiver has been granted authorizing the taking of small numbers of marine mammals in gillnet fisheries off New England. In 1984, NMFS issued four Letters of Authorization that allowed taking of ringed seals incidental to on-ice seismic exploration activities in the Beaufort Sea.

These amendments also made changes regarding the potential transfer of management of marine mammals to the States. We have published with the Fish and Wildlife Service the final regulations governing the transfer of management. We are encouraging the States to cooperate with one another to achieve the goal of consistent and

comprehensive management of transboundary stocks as they develop plans for transfer of management.

In addition to our domestic activities, the Act requires the Secretary to engage in international negotiations that further the goals of conservation and enhancement of marine mammal populations. The most notable international achievement since the Act was passed in 1972 is the moratorium on commercial whaling adopted by the International Whaling Commission in 1982 which will be implemented beginning in late 1985.

The United States is a member of another international group, the North Pacific Fur Seal Commission, which is concentrating on the problem of entanglement and the larger issue of the population decline of the fur seals. The Commission sets harvest levels for the northern fur seal and reviews research by the party governments.

The tuna/porpoise interaction has been one of the most complex problems we have had to deal with in the administration of the Act. However, in recent years, remarkable progress has been made in reducing porpoise mortality in commercial tuna fishing operations. Since the current general permit authorizing the take of porpoise incidental to the U.S. tuna fishery expires in 1985, we have initiated the process for determining the management regime that we will implement for 1986 and beyond, and we will prepare an environmental impact statement (EIS) that addresses the potential impacts of various management options. We have held public scoping meetings in Washington, D.C., and San Diego, Calif., to ensure that we are aware of all issues that should be addressed in the EIS.

The appendix includes a table that details authorization and appropriation of funds for fiscal year 1984 under the MMPA.

PART I

ADMINISTRATIVE PROGRAMS

Incidental Takings of Marine Mammals During Commercial Fishing Operations

General Permits

A general permit system established under the Act authorizes the incidental taking of marine mammals by domestic and foreign fishermen during commercial fishing operations. General permits are issued by NMFS to foreign fishing associations of nations whose governments have a governing international fishery agreement (GIFA) with the United States that allows them to fish in the U.S. fishery conservation zone. For 1984, NMFS has issued or continued eleven foreign general permits that allow a total taking of 6,452 marine mammals annually. This includes the take of 5,500 Dall's porpoise during salmon gillnet operations under a general permit issued to the Federation of Japan Salmon Fisheries Cooperative Associations.

Domestic fishermen may apply for a certificate of inclusion issued under a general permit if they incidentally take marine mammals. Excluding the general permit issued to the American Tunaboat Association and its annual quota of 20,500 porpoise, NMFS has issued ten domestic general permits, nine of which are valid until December 31, 1988. These permits allow a total taking of 6,445 animals each year. Tables 1 and 2 in the Appendix include a list of foreign and domestic fishing corporations with permits and the numbers of marine mammals they are allowed to take.

'Small Take' of Marine Mammals

An amendment made to the Act in 1981 allows for the incidental but not intentional taking of small numbers of nondepleted species or stocks of marine mammals by citizens of the United States while engaged in commercial fishing operations. This exemption to the general permit requirements of the Act can be granted only if the total taking will have a negligible impact on the species or stocks involved and if a reporting system has been established among the fishermen involved to monitor and report any taking.

Final guidelines covering the small take of marine mammals taken incidental to commercial fishing were published by NMFS on December 13, 1983. These guidelines include procedures for applying for a Letter of Exemption which authorize the take and the requirements for establishing a system for reporting any takings.

In February 1984, a Letter of Exemption was issued to the New England groundfish gillnetters to take up to 180 harbor porpoise and 50 harbor seals during groundfish gillnetting operations in the Gulf of Maine. The exemption is valid until December 31, 1988. The Division of Wildlife, University of Maine at Orono, will be the recipient of any reports of marine mammals taken under this exemption.

'Small Take' of Marine Mammals (other than commercial fishing)

Final regulations governing small takes of marine mammals incidental to specified activities were published in 1982. The regulations include procedures for submitting and evaluating general requests to allow animals to be taken incidental to a specified activity in a specified geographical region. Also, they establish specific regulations to take ringed seals incidental to on-ice seismic activities in the Beaufort Sea from 1982 through 1986. The specific regulations outline permissible methods, dates, and locations of takings and requirements for monitoring and reporting.

We issued six Letters of Authorization to seismic exploration companies in 1983, and we issued four letters for 1984. NMFS issued these letters based on a finding that the level of taking would have a negligible impact on the ringed seal species or stock and its habitat and on its availability for subsistence use. The specific geographic location in the regulations covers the Beaufort Sea from Pt. Barrow to Demarcation Pt. These activities may take place only between January 1 and May 31, and two types of energy sources, the vibrator-type and watergun method, have been authorized.

Importation of Yellowfin Tuna

The MMPA directs the Secretary (of Treasury) to ban the importation of commercial fish or fish products which have been caught with commercial fishing technology which results in the incidental kill or incidental serious injury of ocean

mammals in excess of U.S. standards. The Act requires the Secretary to insist on reasonable proof from the government of exporting nations of the effects on marine mammals of the commercial fishing technology used for fish or fish products exported.

Standards have been established only in the yellowfin tuna purse-seine fishery. U.S. regulations prohibit the entry of yellowfin tuna or yellowfin tuna products from nations purse seining for this species in the eastern tropical Pacific Ocean unless that nation has been found to be fishing in substantial conformance with U.S. regulations regarding the protection of porpoises. Nations currently embargoed under these regulations are Mexico and the U.S.S.R.; for 1984, six nations have been certified as fishing in substantial conformance with the regulations.

Marine Mammals and Fisheries Interactions

Northeast Region

Occasionally, marine mammals are taken incidentally to commercial fishery operations in the Gulf of Maine and in foreign fishing and joint fishery ventures in the Mid-Atlantic. Marine mammal interactions with bottom gillnet operations for groundfish (cod, haddock, hake, cusk, and pollock) in the Gulf of Maine usually result in little damage to gear or catch. However, entanglement of harbor seals and harbor porpoise has been reported. NMFS is funding studies to determine the extent and impact of marine mammals/fisheries interactions on both the mammal populations and the fisheries in the Gulf. The University of Maine is studying the distribution and abundance, habitat use patterns, and population discreteness of harbor seals in addition to investigating the fisheries interaction problem for all marine mammal species in the area.

Marine mammals are taken incidentally in joint U.S. foreign fishing ventures that use trawling gear for squid, mackerel, and butterfish in the Mid-Atlantic offshore waters. Pilot whales, common dolphins, and false killer whales are the marine mammal species most likely involved.

Preliminary analyses of data suggest that the total take of marine mammals in fishery operations in the Northeast Region is not significant and does not seriously threaten the marine mammal populations involved. Further research efforts will provide us with a clearer analysis of this potential problem.

Alaska Region, Northwest Region and
Northwest and Alaska Fisheries Center

The Center is studying the incidental catch of northern sea lions by U.S. fishermen in the pollock joint venture fishery in Shelikof Strait, Alaska. Since this joint venture is expanding, the level of sea lion take and the impact of this take to local sea lion populations need to be assessed. In 1982, 528 dead northern sea lions were reported by U.S. fishery observers. Based on observer coverage, an estimated 1,393 sea lions were taken in 1982. During 1983, although 169 dead sea lions were reported, the total take was estimated at 222. Changes in the location and dates of the fishery are likely causes for the decline in 1983. Immature males and females of all ages were the predominant age-classes incidentally caught. Most were caught between 8 p.m. and 5 a.m. during net ascent or near the surface during net retrieval. The estimated number of animals caught in 1983 represented about 1.1 percent of the sea lion population present in the Shelikof Strait-Kodiak area during the fishing season. As part of its Bering Sea research program, the Center also studies the overall impact of commercial fishing on marine mammal stocks in the Bering Sea.

Since 1980, NMFS has contributed funds to the Washington Department of Game to study marine mammal-fisheries interactions in the Columbia River and adjacent waters. Partial support was provided also by the Columbia River Estuary Data Development Program and the Marine Mammal Commission.

After three years of study, researchers have found that marine mammal/fisheries interactions occurred in 62 percent of the salmon gillnet fishing trips in the study area (lower Columbia River, Grays Harbor, and Willipa Bay), and these interactions resulted in damage to fish catches, fishing gear, and/or marine mammals in 36 percent of all the fishing trips sampled. Harbor seals were the primary cause of fish damage in all estuaries and seasons. The harbor seal population in the study area has increased at an annual rate of about 11 per cent between 1976 and 1982. Researchers have also found significant damage by seals to adult salmonids indicating that seals are hunting free-swimming salmonids in river channels. Not enough is known at this time to estimate the predation rate on return adult salmonids or the mortality rates of the injured salmonids that survived the seal attacks.

The State of Washington currently has a contract from NMFS to identify and evaluate the most effective methods for mitigating marine mammal/fisheries conflict in the Columbia River; this research is expected to be completed in 1984.

Southwest Region

Under contract to the Southwest Region and Center, the California Department of Fish and Game continued to investigate marine mammal/fishery interactions and to collect data required for the assessment of the status of harbor seal populations. During this past year, estimates of marine mammal mortality in gillnet fisheries were refined and work continued on the development of non-lethal means of mitigating fisheries interactions.

Transfer of Marine Mammal Management to the States

In May 1983, NMFS and the Fish and Wildlife Service published final regulations implementing the 1981 amendments to Section 109 of the MMPA. These regulations establish new procedures for the transfer of management authority, the form and minimum requirements of a state application, and the countinuing relationship of Federal and State wildlife agencies on marine mammal issues.

The new procedures, established by Congress and implemented by our regulations, involve a simplified three-step process. First, the state must submit a request for transfer of management authority for a given species or a number of species of marine mammals. This request and its supporting documentation is then reviewed to determine if the state has developed and will implement a program for the conservation and management of the species which meets certain requirements included in the Act. Second, if the FWS or the NMFS publishes a proposed finding that the state program meets these requirements, the state must make a determination, under procedures set by the Act, of the optimum sustainable population (OSP) of the species and the maximum allowable take that is consistent with maintaining the species at OSP. Third, the state's determinations must be implemented through state laws and/or regulations. If the range of the species extends beyond the territorial water of the state, the State and Federal governments must agree on a process for allocating the take in areas under respective State and Federal jurisdictions. Once this cooperative allocation agreement, if required, has been implemented and the OSP and maximum allowable take

determinations are final and implemented under state law, NMFS will publish a final finding and rule transferring exclusive authority to manage marine mammals to the state. The only exception to this assumption of exclusive jurisdiction would be for takings by non-state personnel for scientific research and public display and takings by Federal officials for health and welfare purposes, activities which remain under the control of the Federal Government pursuant to section 109 of the Act.

NMFS is in frequent contact with wildlife personnel of the states of California, Alaska, Washington, Oregon, and Maine in an attempt to explain the new procedures and offer any guidance or advice requested. At this time, we have not received any applications for state management.

Permits for Scientific Research and Public Display

The Act allows permits to be issued for taking or importing marine mammals for scientific research or public display. Three steps must be taken before a permit can be granted:

1. Receipt and initial review of the application by NMFS, publication of a notice of receipt in the Federal Register, and transmittal of the application to the Marine Mammal Commission for review;

2. A 30-day review of the application by NMFS, the Commission, the public, and other Federal agencies; and

3. Final processing by NMFS, including consideration of comments, and approval or denial of the application.

During the past year, 64 applications were considered. Of these, 56 have been resolved; 24 scientific research permits were issued, and 13 public display permits were issued. There were 105 modifications, amendments, or authorizations for take or related activities.

The following tables appear in the appendix and provide a detailed overview of the permit program:

- common and scientific names of marine mammals requested in scientific research/public display permit applications (table 3);

- summary of permit applications (table 4);
- cetacean take requested in scientific research/public display permit applications (table 5);
- pinniped take requested in scientific research/public display permit applications (table 6);
- cetacean take authorized by scientific research/public display permits (table 7);
- pinniped take authorized by scientific research/public display permits (table 8);
- authorized take for permanent removal from the wild-cetaceans (table 9);
- authorized take for permanent removal from the wild-pinnipeds (table 10);

Killer Whale Permit

A permit application from Sea World, Inc. to take killer whales for public display and scientific research received considerable national attention. The application was extensively reviewed by NMFS, the Marine Mammal Commission, and the public. We held a public hearing on the application, and, during the extended comment period, received thousands of comments both supporting and opposing issuance of a permit. After a thorough review of the comments, available information and requirements of the MMPA, we issued a public display/scientific research permit to capture up to 100 killer whales over a 5-year period. Of these, up to 10 may be taken and maintained in captivity for display and breeding. The remaining animals, up to 90, may be captured for research and released. Many of the research activities will not be authorized until further information is received and evaluated. The permit contains many restrictions and conditions to ensure that there will be no significant adverse effects on the populations of killer whales involved.

Regional Marine Mammal Stranding Networks

Four of the Regions are operating marine mammal stranding networks. The networks include individuals and organizations that volunteer to cooperate with a NMFS coordinator. Authorized members may collect scientific specimen materials, record the event with the Regional Coordinator, and are obligated to assist local and Federal authorities in the disposal of the animals.

In 1983, The Cousteau Society (TCS) offered its assistance to the marine mammal stranding networks and sponsored a two-day meeting of all network coordinators to assess how it could best assist them. Funds received from a special appeal to the membership were distributed to individual network foundations.

The primary accomplishment of this appeal was the resumption of a nationally centralized data file for stranding reports. This Marine Mammal Events Program (MMEP), coordinated at the Smithsonian Institution, replaces the Scientific Events Alert Network (SEAN) which was disbanded in 1982 due to funding constraints. TCS contributed funds to hire a part-time data technician to receive, collate, and enter stranding reports into a computer file. Although the MMEP is concentrating initially on cetacean strandings (Table 11, Appendix), it is examining the value and feasibility of adding pinnipeds. The involvement of the TCS has greatly facilitated communication between and within the stranding networks. Future projects may include the development and distribution of regional stranding posters for public information, analysis of backlogged data bases, and extending assistance to numerous volunteer participants of the network.

Southwest Region

Final organizational meetings were held for network cooperators and participants. A directory was updated and revised and sent to all network participants along with a summary of 1983 strandings and a newsletter which described developments in network organization and 1983 accomplishments. A network foundation account was established to manage and distribute funds donated from The Cousteau Society and other organizations. The NMFS Regional Coordinator presented papers to the International Association for Aquatic Animal Medicine, the Southern California Academy of Sciences, and the Society for Marine Mammalogy to publicize the network and encourage the

scientific community to use specimen material collected by participants. In October, the coordinator traveled to England as the guest of the Royal Society for the Prevention of Cruelty to Animals to join an international workshop on stranded whales and to assist in the formulation of a British marine mammal stranding network.

In 1983, over 1,800 pinniped, about 100 cetacean, and 3 sea turtle strandings were reported for the California coast.

Northeast Region

The Northeast Regional Stranding Network (NRSN) reports strandings, notifies enforcement agencies, recovers live and dead stranded marine mammals and coordinates and reports scientific research. The regional network includes representatives from the NMFS law enforcement division, State law enforcement agencies, State and local fisheries officers, and six major institutions that hold Letters of Agreement from the Northeast Region. All non-law enforcement personnel working in the network come under the control of the Letter of Agreement holders.

Letters of Agreement have been issued to organizations that have displayed expertise, professionalism, and cooperation when dealing with stranded marine animals. Holders of Letters are the only institutions that can legally take part in a marine mammal stranding in the Northeast Region.

The Region is divided into separate geographical areas of responsibility for each of the six institutions. The network has proven its ability to use data from strandings, provide an efficient format for its dissemination, ease enforcement efforts, encourage cooperation between agencies, investigators, institutions and the public, and reduce duplication of effort. The network is responsible for identifying individuals and/or institutions in the areas that are carrying out programs beyond basic data collection and assisting their needs. Marine mammal parts are made available to qualified universities, museums and individual researchers for public display or educational purposes.

Southeast Region

The Southeast Fisheries Center supports research on cetacean species in the region through the Southeast U.S. Marine Mammal Stranding and Salvage Network. The network is operated under contract to Dr. Daniel Odell of the Cooperative Institute of Marine and Atmospheric Sciences, Rosensteil School of Marine and Atmospheric Science, University of Miami. The network has expanded considerably since its beginning and includes collaborating professional State and Federal biologists, law enforcement agents, private aquaria personnel and other interested persons. In 1983, a total of 256 cetaceans representing at least 24 species were reported to the network. Strandings and sightings reported to the network are presented in the following table.

Cetaceans Reported to the SEUS Stranding and Salvage Network in 1983

SPECIES - COMMON NAME	NUMBER REPORTED	PERCENT OF TOTAL
Tursiops truncatus - Atlantic bottlenose dolphin	115	44.9
Kogia breviceps - Pygmy sperm whale	39	15.2
Stenella attenuata - Slender-beaked porpoise	19	7.4
Stenella plagiodon - Atlantic spotted dolphin	13	5.1
Stenella clymene - Short-snouted spinner dolphin	10	3.9
Lagenodelphis hosei - Fraser's dolphin	9	3.5
Pseudorca crassidens - False killer whale	7	2.7
Feresa attenuata - Pygmy killer whale	6	2.3
Physeter marcrocephalus - Sperm whale	6	2.3
Balaena glacialis - Right whale	5	2.0
Stenella attenuata - Spotted dolphin	4	1.6
Kogia simus - Dwarf sperm whale	3	1.2
Megaptera novaeangliae - Humpback whale	3	1.2
Mesoplodon europaeus - Antillean beaked whale	2	0.8
Grampus griseus - Risso's dolphin	2	0.8
Globicephala macrorhynchus - Short-finned pilot whale	2	0.8
Ziphius cavirostris - Cuvier's beaked whale	2	0.8
Stenella coeruleoalba - Striped dolphin	2	0.8
Balaenoptera physalus - Fin whale	2	0.8
Globicephala malaena - Long-finned pilot whale	1	0.4
Stenella longirostis - Spinner dolphin	1	0.4
Balaenoptera edeni - Bryde's whale	1	0.4
Phocoena phocoena - Harbor porpoise	1	0.4
Unidentified delphinid	1	0.4

Northwest Region

Participants in the Northwest Marine Mammal Stranding Network are volunteers from the Marine Animal Resource Center, Seattle, Wash.; Washington Department of Game's Marine Mammal Project, Astoria, Oregon; Oregon State University Marine Science Center, Newport, Oregon; and the University of Oregon, Institute of Marine Biology, Charleston, Oregon. The network participants cooperate with the Washington State Patrol; the Washington Department of Game; the Oregon Department of State Police; the Oregon Department of Transportation, Parks and Recreation Division; the Oregon Department of Fish and Wildlife; and NMFS.

The Northwest Marine Mammal Stranding Network was especially busy in 1983 with an unusual number of gray whale strandings. The twelve gray whale strandings in Washington and Oregon in 1983 is a dramatic increase over the numbers observed in past years in which there were an average of two to four gray whale strandings per year. In addition to investigations on beached cetaceans and pinnipeds, network participants were also active during the harbor seal pupping season which begins in March in coastal waters and ends in September in Puget Sound. Many healthy harbor seal pups are reported as sick or abandoned and sometimes removed from beaches by well-meaning people who believe the pups have been abandoned by their mothers. However, the mother may return if the pup is left undisturbed, and removing pups eliminates the possibility of the pup being re-united with its mother.

Law Enforcement

Law enforcement is an important aspect of our management program. The moratorium on taking marine mammals is enforced by special agents from the NMFS and State agents under contract to NMFS. Over the years, most violations have involved the illegal importation of marine mammal parts or products, as well as activities related to the incidental take of marine mammals in fisheries. Last year, we investigated 172 alleged violations of the Act. Of these, 74 were violations involving illegal takings and harassment. Our agents in Hawaii extensively patrol the areas where humpback whales calve and breed to enforce our guidelines regarding harassment of these animals.

In addition to investigating violations of the Act, NMFS special agents also investigate reports of stranded and beached marine mammals. NMFS special agents in the Cape Cod

Bay area rescued 22 pilot whales in one stranding, and, in California, agents investigated 200 separate incidents of beached or stranded marine mammals (usually seals or sea lions).

In 1983, a District Court upheld the Agency's authority to seize dolphins on an in-transit shipment through the U.S. from Mexico to Canada and to fine the owners for illegal importation. Marine Wonderland and Animal Park, Niagara Falls, Canada, had filed for approximately 1.3 million dollars in damages under the Federal Tort Claims Act for illegal seizure of 6 dolphins in 1977. The same judgment upheld the Agency's administrative decision and forfeiture of the animals.

Legal Actions

Balelo v. Baldrige, (9th Cir.) Civ. No. 81-5807, 81-5806; United States v. $50,178.80, (9th Cir.) Civ. No. 82-5433.

In this class action, commercial tuna fishermen challenged the Agency's statutory and constitutional authority to promulgate a regulation during the 1980 tuna/porpoise rulemaking allowing the Agency to require NMFS observers on board a tuna boat as a condition to obtaining a certificate of inclusion. In July 1981, the U.S. District Court for the Southern District of California held the regulation invalid because it sanctioned the use of observer gathered information for enforcement purposes. The Court found the regulation was beyond the Agency's statutory authority for these purposes, and, without statutory authorization, the pervasively regulated industry exception to the fourth amendment warrant requirement does not apply.

A three judge panel of the Ninth Circuit Court of Appeals went beyond the decision of the district court by finding the regulation invalid for all purposes including the collection of scientific data (which the district court had found allowable). However, the Government was granted a rehearing before a full panel of the Ninth Circuit which set aside the decision made by a panel of three judges. This decision, issued by the Ninth Circuit on January 24, 1984, reversed the decision of the district court and held that the regulation was authorized under the broad rulemaking authority of the MMPA, and it fell within the pervasively regulated industry exception to the warrant requirement of the fourth amendment. The court affirmed the judgment in the companion case U.S. v. $50,178.80, a civil forfeiture action in which defendants' motion to supress observer

collected evidence was denied by the District Court of the Central District of California. However, the claimants maintain that the ruling does not dispose of the issue in U.S. v. $50,178.80. The Government will file for summary judgment to settle this matter.

American Tunaboat Association v. Baldrige, (9th Circuit) Civ. No. 82-5588.

In this action, the American Tunaboat Association (ATA) challenged the Administrator's refusal to follow the Administrative Law Judge's (ALJ) recommendations on three specific scientific findings in the Agency's final decision in its 1980 tuna/porpoise rulemaking held in conjunction with the ATA's application for a general permit. The case was brought even though the Agency authorized a quota of 20,500 porpoise for each of the years 1981-1985 and issued a general permit covering these years. The portions of the Agency's final decision challenged by the ATA were 1) whether the calculation of mean school size by the Agency should have used data obtained by agency observers aboard tuna boats, 2) whether an incorrect premise, that observers on aerial surveys could be expected to see all large porpoise schools on the trackline, was used in the agency's calculation of the density of porpoise schools, and 3) whether the area inhabited by porpoise was larger than the value used in the agency's analysis.

On March 10, 1982, the U.S. District Court for the Southern District of California entered an order declaring that the determinations of the ALJ on the three disputed matters were the best available scientific evidence within the meaning of the Act and that the Administrator should have accepted them. The Agency has appealed the decision of the district court on the grounds that the Administrator's findings were supported by the substantial expert opinion evidence in the administrative record. The case has been fully briefed and argued before the U.S. Court of Appeals for the Ninth Circuit but was withdrawn from submission by the court pending a decision in Balelo v. Baldrige. No action has been taken by the court to resubmit the case.

PART II

INTERNATIONAL PROGRAMS AND ACTIVITIES

The MMPA directed the Department of Commerce to seek to further the protection and conservation of marine mammals under existing international agreements and to take the initiative necessary to negotiate additional agreements required to achieve the purposes of the Act. The NMFS participates in many international programs and activities to carry out the intent of the Act.

International Whaling Commission (IWC)

1983 IWC Meeting. The United States had two primary objectives for the 35th Annual Meeting: to ensure that the previous year's moratorium decision was not diluted or otherwise changed in substance and to seek a bowhead catch limit for 1984 consistent with the IWC's new aboriginal subsistence whaling management scheme. These objectives were substantially achieved.

IWC Moratorium Decision. In the months following the adoption of the moratorium, four member governments (Japan, Norway, Peru, and the U.S.S.R.) exercised their rights under the Convention and filed an objection to the moratorium which removed any technical obligation under international law to comply. The 35th Annual Meeting did not amend the moratorium decision or take any other action to modify its substance. During the meeting, the Government of Peru withdrew its objection to the moratorium leaving three countries maintaining an objection. In addition, the Government of Chile announced its domestic prohibition of all whaling as of July 1983 and its intention to comply with the moratorium.

Two U.S. laws have provisions that are linked to whale conservation practices of other nations. Under the Pelly Amendment to the Fishermen's Protective Act, the U.S. may embargo imports of fish products from countries whose nationals are certified by the Secretary of Commerce as conducting fishing operations (including whaling) in a manner or under circumstances that diminish the effectiveness of international conservation programs such as the IWC. The Packwood-Magnuson Amendment to the MFCMA mandates a reduction by at least 50 percent in the allocation of fish that may be caught in the U.S. fishery conservation zone (FCZ) by any nation that is certified by the Secretary.

Aboriginal Whaling. After years of intensive work, the IWC adopted, at its 1982 Annual Meeting, management principles and procedures to govern aboriginal subsistence whaling. They formally recognized in a separate management scheme the distinction between commercial and aboriginal subsistence whaling. The scheme codified the IWC's attempt to strike a proper balance between the needs of aboriginal people who depend on limited whaling to meet subsistence, cultural, and nutritional needs and the conservation needs of the affected whales. It requires that hunting be managed to provide for the recovery of depleted whale populations.

At the 35th Annual Meeting, catch limits were set for Bering Sea bowhead whales, Eastern North Pacific gray whales, and West Greenland fin, minke, and humpback whales. After a lengthy discussion, the Commission adopted a 2-year strike limit of 43 bowhead whales in 1984/85 with a maximum number of strikes in either year of 27 and a provision for review at the end of the first year. The Commission also set the following catch limits for 1984:

Eastern North Pacific gray	179
West Greenland humpback	9
West Greenland fin	6
West Greenland minke	300

Commercial Catch Limits. The 35th Annual Meeting set commercial whaling catch limits reflecting the continued application of existing management procedures and a desire to allow interim catches by members who have accepted the moratorium so as to provide them time to identify and implement transition measures. Commercial catch limits set for the 1983/84 pelagic and 1984 coastal whaling seasons resulted in a 24 percent reduction from the 12,371 total agreed at last year's meeting to 9,390 marking the first time in the IWC's history that commercial limits have been less than 10,000 animals. A table reflecting the newly established catch limits and the trend in catch limits is included in the Appendix.

Humane Killing. At the 1981 annual meeting, the Commission voted to ban using the cold (nonexploding) harpoon to kill minke whales; the ban was to become effective with the 1982/83 pelagic and the 1983 coastal seasons. Brazil, Iceland, Japan, Norway and the U.S.S.R. filed objections. At the meeting, Japan was congratulated on the success of its efforts to replace the cold grenade harpoon which resulted in total compliance with the ban. Norway pledged its best efforts for total compliance in 1984

which include final safety testing and production of its prototype exploding harpoon. The Soviet Union reported virtually no progress toward compliance. Information submitted by both Japan and Norway indicated that the time to death of struck animals was substantially reduced when the exploding (vs. the nonexploding) harpoon was used.

Inter-American Tropical Tuna Commission (IATTC)

Since many of the purse-seine vessels left the eastern tropical Pacific to fish in the western Pacific, the number of trips from the international fleet that the IATTC had planned to sample for porpoise mortality were reduced. Out of 63 trips planned, of which 20 were to be non-U.S., only 26 trips were completed or were in progress as of October 1, 1983. Of these, only one involved a non-U.S. vessel (Panamanian). Although ten trips were scheduled on Mexican vessels, no progress has been made in reaching agreement with Mexico to deploy the observers.

The estimated purse seine catch of yellowfin associated with porpoise in the eastern tropical Pacific in 1983 is 32.9 percent, the lowest since 1978. Porpoise mortality inflicted by the United States registered fleet in 1983 is considerably below the rate for the same period in 1982. This reduction in mortality is the result of reduced fishing effort as well as reduced fishing on porpoise.

International North Pacific Fisheries Commission (INPFC)

Because of amendments made in 1982 to the North Pacific Fisheries Act, marine mammal discussions at the 1983 annual meeting centered on ways to incorporate the provisions of the new law into the marine mammal research program of INPFC. Gear modification to reduce the likelihood of entanglement of marine mammals will be operative in 25 percent of the catcherboats in each of the Japanese mothership salmon fleets fishing in the U.S. FCZ during 1984. The modifications will be increased on an annual basis until 100 percent of the Japanese fleet is fishing with gear that will help limit the incidental take of Dall's porpoise.

Although the reported take of Dall's porpoise decreased in 1983, the INPFC noted that ways are still being sought to minimize interaction between marine mammals and the salmon fishery. The United States is working with Japan on research programs outside the U.S. FCZ to develop more

complete data on population distribution and incidental take.

In addition to discussions on incidental take and gear modifications, negotiations began between the United States and Japan regarding the Memorandum of Understanding on marine mammals which is due to expire in June of 1984. Under this document, the two countries will agree on an acceptable research program to be conducted under the auspices of INPFC that will include sampling, monitoring, and analysis of Dall's porpoise data throughout the mothership salmon fishery.

North Pacific Fur Seal Commission (NPFSC)

At the 26th annual meeting of the Commission held in Washington, D.C., during April 1983, members set harvest levels and reviewed research by the party governments. The Commission reviewed the 1982 report of its Standing Scientific Committee and expressed concern regarding the finding that the fur seal population is declining at an annual rate of 4 to 8 percent. This decline is not thought the result of the harvest of sub-adult males. Rather, the female harvests during the 1960's and increased mortality of seals at sea appear to be the significant factors in the recent population decline. The causes of seal mortality at sea remain uncertain, but include deaths from entanglement in floating debris, primarily net fragments and plastic packing bands. The NPFSC agreed to continue its efforts with countries fishing in the North Pacific to reduce the discarding of debris at sea. Also, the Standing Scientific Committee planned a 1984 workshop on population trends.

In an effort to combat the problem of entanglement as one way of addressing the larger issue of the population decline, the United States is taking steps to prevent the discard of debris and gear. The International North Pacific Fisheries Commission and the North Pacific Fishery Management Council have been alerted to the problem and revisions of both domestic and foreign fishing regulations are being considered in September 1984.

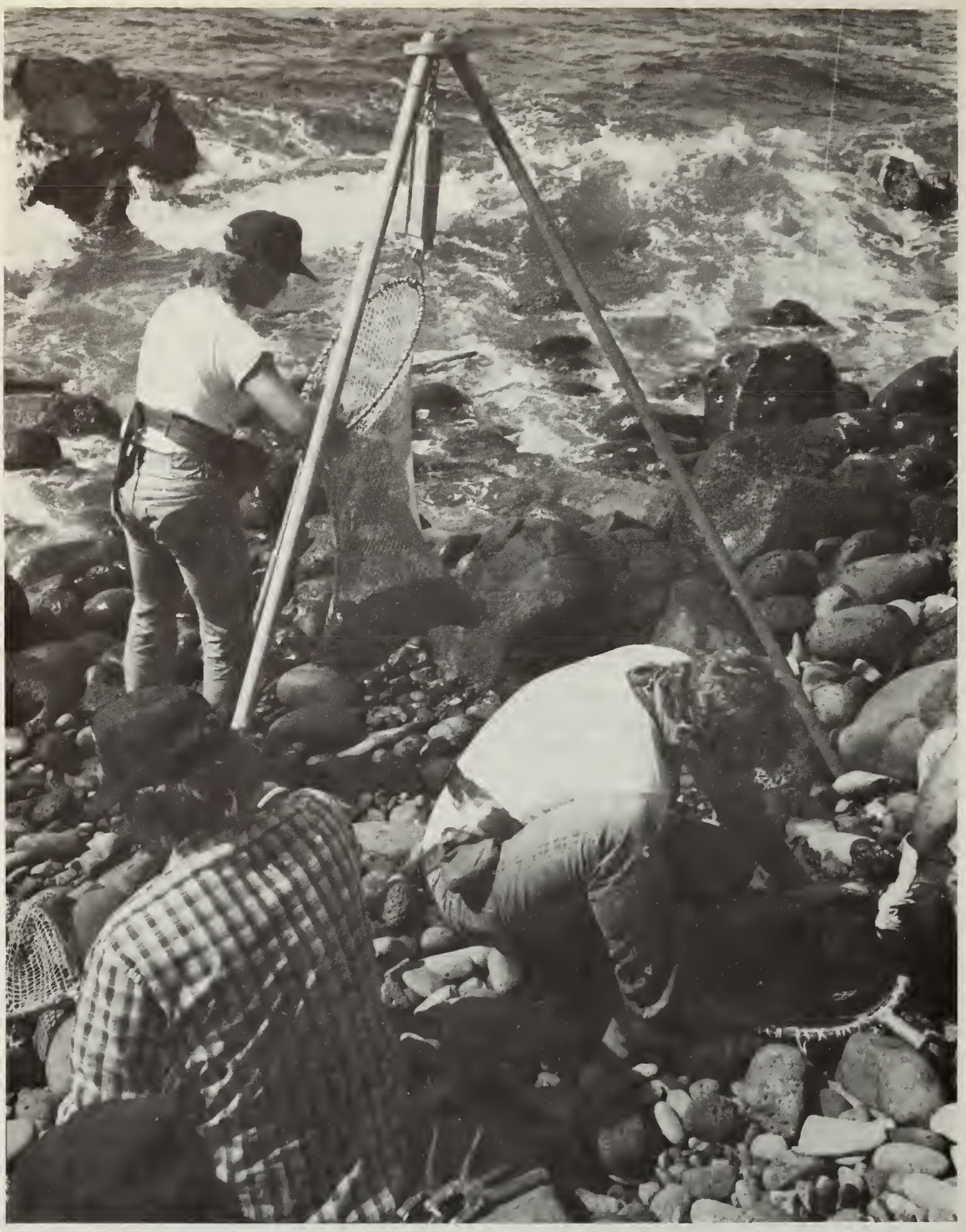
US-USSR Marine Mammal Project, Environmental Protection Agreement

The objective of this project is to promote joint research and exchange of information by U.S. and Soviet scientists on the biology, ecology and population dynamics of marine mammals of concern to both countries.

In 1983, five Soviet scientists visited the U.S. for the Seventh Project Meeting held at the University of California at Santa Cruz. Cooperative research carried out since October 1981 was reviewed including bowhead whale distribution in the Chukchi Sea, walrus surveys to determine age and sex composition of the herds, pinniped osteology, and studies of cetacean morphological variation. Future research was discussed with agreement reached for three exchanges to take place in 1984, and tentative agreement was reached to hold a symposium in the USSR on sea otter research in the fall of 1984 in conjunction with the next Project meeting.

The first volume (Pinnipeds) of the compendium of reports on joint research is now in press; publication is expected in early 1984.

Soviet and U.S. scientists took part in a joint walrus and ice seal research cruise in the northern Bering and Chukchi Seas in August 1983 on the Soviet vessel ZYKOVO. Studies emphasized distribution, reproductive condition, age and sex composition of walrus herds, parasites and morphology.



Biologists weigh and tag sea lion pups at San Clemente Island, Calif. Photo by Dana J. Seagars, Southwest Region, NMFS.

PART III

MANAGEMENT AND RESEARCH PROGRAMS

Southwest Region (Management)
Southwest Fisheries Center (Research)

Gray Whale

The gray whale migrates along the west coast and winters in the lagoons on Baja California where it calves and breeds. It spends its summers feeding in Arctic waters. Although it has recovered to a point where it has been removed from the IWC's "protected" status, the continued increase in its population could be adversely affected by such human activities as whale-watching and oil and gas development. The Region regularly conducts consultations under Section 7 of the Endangered Species Act to address potential impacts of energy development along the outer continental shelf (OCS) as well as other Federal activities to ensure that these projects do not jeopardize the continued existence of the gray whale.

Guidelines for gray whale watching along the California coast are included in a press release issued by the Region and the Center each season before migration season begins. In cooperation with the American Cetacean Society, guidelines were distributed to marinas, yacht clubs, and whale watching groups.

Humpback Whale

The Notice of Interpretation issued by the Region in 1979 for the "taking by harassment" of humpback whales in the Hawaiian Islands area continued in effect for the 1983-84 season. Portions of the guidelines were summarized in a brochure which is distributed to private boaters, whale watchers, airlines serving Maui, and the general public year round. Special agents were assigned temporary duty in Hawaii to augment enforcement efforts and increase public awareness through increased public contact. Enforcement efforts also have been aided by the operation of a NMFS patrol vessel.

The number of complaints of harassment of humpback whales increased in the 1982-83 season over previous years. This may have been due to better weather conditions and to better understanding by the public of what activities

constitute harassment. Monitoring of research activities will be an area of special emphasis this coming year. Continuation of the program is critical to obtaining public understanding and reducing or eliminating harassment.

As part of the ongoing management program for humpback whales, the Region's Western Pacific Program Office conducted consultations under Section 7 of the Endangered Species Act. Federal projects were reviewed and recommendations made to ensure that associated activities would not jeopardize the continued existence of humpback whales.

Bottlenose Dolphin

The Center completed a study on the population ecology of bottlenose dolphins in San Diego County which indicated that there are roughly 240 bottlenose dolphin in that area. The study was based on a series of aerial and photographic surveys in which individuals were recognized from distinctive scar patterns on their dorsal fins. A follow-up study started in October 1983 is using individually recognizable animals to investigate school integrity. This work is being done cooperatively with student interns from South Hampton College, New York.

Pilot Whale

The Center completed three surveys in 1983/84 to estimate the minimum population size for pilot whales in the Southern California Bight. This work is a continuation of a monitoring program that was initiated jointly by the Center and the California Department of Fish and Game in 1981. One aerial survey and one vessel survey were made in December 1983 around Catalina Island and over the entire Bight. No pilot whales were seen on either survey. The results of the third survey (an aerial survey around Catalina Island) are not available yet. Also, a contract was let to the University of California, Santa Cruz, to study the movement patterns and reproductive behavior of pilot whales around Catalina Island by using individually recognizable markings.

Harbor Porpoise

The Center and Region let a contract to the University of California, Santa Cruz, to census, using aerial surveys, harbor porpoise and other cetaceans in the Farallon basin

off the coast of central California. Thirty-three harbor porpoise have been sighted to date during the surveys. Additional surveys of the entire coast are being planned in a joint study by the National Marine Mammal Laboratory and the Center.

Porpoise* Taken Incidentally in the Yellowfin Tuna Fishery

During the past year, region personnel worked closely with the Inter-American Tropical Tuna Commission (IATTC) which sponsored 30 US/IATTC cooperative observer cruises on purse seine vessels in the eastern tropical Pacific.

Region staff made net and gear inspections on board 60 certificated U.S. tuna seiners to ensure the presence of required porpoise safety gear. Additionally, they assisted three vessels during trial net sets off San Diego prior to fishing voyages to adjust super apron positioning for the most effective use. Requests for NMFS personnel to help construct super aprons were received periodically as old webbing was being replaced. Although hands on assistance is no longer available, detailed instructions and advice on super apron construction were provided.

Tuna Seiner Operator's Workshops were held for 11 skippers in 1983. A total of 93 operators' and 60 vessel certificates were issued. Since marine mammal regulations remained unchanged for 1983, Operators holding 1982 Certificates of Inclusion were not required to attend 1983 workshops.

The Center's research program continues to focus on understanding the abundance and biology of porpoise associated with the purse-seine fishery for tunas in the eastern tropical Pacific Ocean (ETP). The objective of this research is to provide estimates of the status of stocks of these porpoise for use in preparing an environmental impact statement to be issued in conjunction with regulations governing the taking of marine mammals associated with the fishery in 1986 and beyond. Major activities in 1983/84

---

*NMFS uses the term porpoise, rather than dolphin, to prevent confusion with the dolphin fish, an object of sport and commercial fishing. However, the common name is used when discussing individual species or stocks such as an eastern spinner dolphin.

included review by a series of panels of the Center's research results and the completion of a survey of porpoise populations.

The panels were convened to review the scientific findings of the Center's research program. Panels were composed of experts in the biology of marine mammals and in the analytical techniques used in stock assessment. These experts were from the NMFS, other U.S. and international agencies, and from academic institutions. They reviewed the results of the following Center research:

o Research regarding the distribution of porpoise including studies to identify ranges of species, specific stocks or management units, and to discover possible relationships between distribution and environmental conditions. All sightings data were evaluated for accuracy to update previous estimates of ranges of the principal species. Tag-return data and geographic variability in morphological characteristics were used to differentiate between stocks. A correlation analysis attempted to estimate the relationships between distribution of populations and levels of various oceanographic factors.

o Research concerning vital rates of porpoise including studies on age determination and growth, reproduction, and the dynamics of their populations. Techniques of aging porpoise using dental layers were improved and the calibration of layers using tetracycline labels described. The precision of age determination was investigated. Studies of reproduction of porpoise included analysis of trends and variability of reproductive rates. Aspects of reproduction of female spotted dolphin and reproductive maturity and seasonality of male spotted dolphin were investigated. Rates of increase in populations of cetaceans in general and the dynamics of populations of spotted dolphin in the ETP were reviewed.

o Research on abundance of porpoise including investigations dealing with species proportions, sizes of schools, estimates of the density of schools, and estimates of abundance. Species proportions by geographic area were developed. Techniques to estimate school sizes using aerial photography were evaluated. The effects of various sighting factors on estimates of school size, using sightings data collected aboard tuna and research vessel and from aircrafts, were assessed. The effects of observer ability and technique and the reaction of porpoise to the presence

of a vessel were assessed. The density of schools in the ETP was estimated using line-transect methods, and the assumptions of the methods tested.

o Research concerning porpoise mortality including an estimation on the numbers of porpoise chased, captured, injured and killed incidental to the tuna fishery in the ETP. Also, the effects of factors associated with estimating mortality from tuna vessels, such as observer ability and technique, were assessed.

In April 1983, the NOAA research vessel DAVID STARR JORDAN completed a 90-day survey of porpoise populations in the ETP. Data on density, size and species composition of schools were collected. The area surveyed included waters south of the Galapagos Islands, an area which had not been previously surveyed. This area is approximately the southern boundary of the tuna fishery in the ETP and roughly the southern boundaries of the distributional range for stocks involved in the fishery. On this survey, a total of 343 schools which included 13,000 animals were sighted. During the survey, the JORDAN joined the NOAA vessel SURVEYOR to investigate reactions of schools of porpoise to the presence of a vessel. The experiment demonstrated that porpoise schools only occasionally react to the approach of a survey vessel prior to their detection by shipboard observers.

Seals and Sea Lions - California Coast

Since the State of California has expressed an interest in regaining authority to manage the California sea lion, harbor seal, and elephant seal populations, the Region, Center, and State have been developing information to assess the status of those populations, define marine mammal conflicts with human activities, and develop techniques to resolve those conflicts without harming the marine mammal stocks involved. The State will use the information to develop their request for transfer of management authority and to support their determinations of optimum sustainable population levels and levels of maximum allowable take incidental to commercial fisheries.

Due to the increasing number of pinniped research projects along the coast of California, coordination meetings between investigators and land managers were held to ensure that project activities did not adversely impact

study results, the status of populations, and were compatible with requirements of various agencies that have jurisdiction over study sites.

The Region formalized a standardized color coding system for tagging pinnipeds which identifies a specific tag color for each tagging site by species. The code, agreed to by a concensus of pinniped investigators, will be implemented through the NMFS permit system for scientific research.

Guadalupe Fur Seal

A petition to list the Guadalupe fur seal as an endangered species under the Endangered Species Act was submitted to NMFS by the Center for Environmental Education. After a review by NMFS, a finding was made that the petition contained substantial information indicating that the proposed listing may be warranted. We will review the status of the species to determine whether it should be listed as threatened or endangered.

California Sea Lions

The Center is working with the NMML, the California Department of Fish and Game, and Hubbs/Sea World to monitor population levels, to estimate replacement yields, and to determine the impact of predation by California sea lions on pelagic schooling fish. On all of the major rookeries in California, annual pup counts are being made to monitor changes in population levels, mark-recapture studies are continuing to estimate replacement rates, and food habit studies are continuing to determine the species composition of the diet and the total biomass consumed. About 500 pups are tagged per year at the four main rookeries. In 1983, the California population was estimated to be about 74,000 individuals.

Northern Elephant Seals

The Center sponsors research on elephant seals at Santa Barbara Island and San Clemente Island and works with Hubbs/Sea World at San Nicolas Island and with Hubbs/Sea World and the NMML at San Miguel Island. In addition, the Center supports a long term study on elephant seals at the Farallon Islands (contract to Point Reyes Bird Observatory). At all of these rookeries, pup counts are made to monitor changes in population levels and mark-

recapture studies are used to estimate various life history parameters. Currently, the elephant seal population in California is thought to be about 49,000 animals and to be increasing at over ten percent a year.

Harbor Seals

The harbor seal population in California is monitored by contractors: the California Department of Fish and Game counts of harbor seals on mainland rookeries and Hubbs/Sea World makes counts in the Channel Islands. The population in 1982 was over 18,200 animals. The Channel Islands population seems to be increasing rapidly, but data on growth of the population on the mainland are not yet available.

Hawaiian Monk Seal

The Region is implementing a Recovery Plan for the monk seal that was prepared under the Endangered Species Act. A decision will be made this year by NMFS on whether to declare critical habitat, another ESA provision, for the monk seal.

The Region's Western Pacific Program Office conducted several consultations under Section 7 of the ESA to ensure that Federal projects and any associated activities would not jeopardize the continued existence of Hawaiian monk seals.

The Center's Honolulu Laboratory carries out research studies on the Hawaiian monk seal. Long-term cooperative studies were made from 1976 through 1980 by scientists from the Northwest and Alaska Fisheries Center; the National Bird and Mammal Laboratory, Fish and Wildlife Service; and contract researchers of the Marine Mammal Commission.

In 1983, pups at French Frigate Shoals were individually marked to assess survivorship through the pups' first year. Pups born at other islands were tagged to help estimate long-term survivorship, age at first reproduction, movements between the atolls, and birth rate. At Lisianski Island, age-specific survival of the monk seal population marked in 1982 was determined. Survival for 1982 weaned pups at Lisianski was 92 percent from 1982 to August 1983.

Attacks by groups of adult male monk seals resulted in the deaths of several subadult and adult females. Attacks

Hawaiian monk seal entangled in net debris. Photo by John Henderson, Honolulu Laboratory, Southwest Fisheries Center, NMFS.

were witnessed at Kure Atoll, Lisianski and Laysan Islands with most of the documented incidents occurring at Laysan. This behavior may in part be caused by an imbalanced sex ratio of adult monk seals. Adult males outnumber adult females 2.5:1 at Lisianski Island.

A juvenile male monk seal was captured for joint research studies on monk seal physiology, energetics, and feeding habits with the University of Hawaii. Studies of feeding habits continued with analysis of scat samples and spewings collected at 1983 field camps. Nets and other fishing debris were catalogued and collected as they washed ashore at all islands. Removal of debris by field personnel resulted in fewer monk seal entanglements in 1983 than in 1982.

At Kure Atoll, three pups (all males) were born to a small population which includes only eight adult females. Of the eight pups which were "headstarted" at Kure in 1981 and 1982, seven were resighted in 1983. Total Hawaiian monk seal pup production for 1983 is estimated to have been 162 which is lower than the estimated 1982 total of 193. Although estimation methods for the two years differ, the lower total for 1983 probably represents a decline in pup production.

Alaska Region and Northwest Region (Management) National Marine Mammal Laboratory, Northwest and Alaska Fisheries Center (Research)

Bowhead Whales

Under the MMPA, Alaska natives are allowed to hunt the endangered bowhead whale for subsistence purposes. However, since the United States follows the catch limits set by the IWC for this species, regulations managing the hunt are implemented under the Whaling Convention Act of 1949.

An agreement concluded by NOAA and the Alaska Eskimo Whaling Commission (AEWC) in 1981 regarding management of bowhead whale subsistence hunting has been extended through 1987. In February 1983, the NMFS Regional Director in Alaska negotiated an amendment to the agreement concerning the management, inspection, and reporting of bowhead whale subsistence harvests. The cooperative agreement established a strike limit for 1983 of 18 whales. The IWC established a 2-year block quota for 1984-85 of 43 strikes with no more than 27 strikes allowed in 1984.

The Eskimos reached the 1983 strike quota during fall whaling at Kaktovik, where one whale was landed and another was struck but lost, bringing the annual totals to nine landed and nine struck but lost. During the spring hunt, NMFS enforcement agents were based in Gambell/Savoonga, Point Hope and Barrow, and, during the fall hunting, they were in Kaktovik and Barrow.

The State of Alaska, the Alaska Eskimo Whaling Commission, the North Slope Borough, the oil and gas industry, NMFS, and the Department of the Interior have interests and responsibilities in protecting bowhead whales. Although NMFS has lead-agency responsibility under both the Marine Mammal Protection Act and the Endangered Species Act and is responsible for carrying out studies of the bowhead whale population, the Interior is responsible for developing information needed to assess and mitigate any possible adverse impacts of OCS activities on the bowhead and its habitat.

Annual Quotas and Catch of Bowhead Whales 1978-1983

	Quota[1]		Actual Take		
	Landed	Strikes	Landed	Lost	Strikes
1978	14	20	12	6	18
1979	18	27	12	15	27
1980	18	26	16	18	34
1981[2]	17	32	17	11	28
1982	16	19	8	11	19
1983	18	18	9	9	18
1984	-	27[3]	-	-	-

[1] Quotas were first set for this population in 1978. A landed whale counts as a strike. Hunting is to cease when either the landed quota is reached or when the quota of total strikes is reached.

[2] Based on IWC quotas, totals for 1981, 1982, 1983 combined could not exceed 45 landed or 65 struck.

[3] A two year quota not to exceed 43 strikes was put into effect at the July 1983 IWC meeting. A first year limit of 27 strikes was set with the second year (1985) limit to be renegotiated based upon the best available scientific data.

The NMFS bowhead whale research program is carried out at the National Marine Mammal Laboratory (NMML). In 1983, a census of bowhead whales was made with the cooperation of the North Slope Borough which also collected biological specimens. Based on an analysis of data collected from 1978 to 1983, the best minimum estimate of current population size is 3,871. Completed research on ageing, by using biochemical methods to study eye lens nuclei and laminations of the tympanic bullae ("ear bone"), shows that no satisfactory method of ageing is available. Preliminary analysis indicates that female bowheads become sexually mature when they are about 40 feet long, gestation may last 13 months, females give birth every 3 to 6 years, and conception and calving occur primarily from April to June with conception probably occurring no earlier than March.

Humpback Whale

Of special concern to NMFS is the North Pacific population of humpback whales which includes only about 1,000 animals. In the summer, a portion of this stock is found in Glacier Bay National Park and other areas in southeast Alaska. Most of the North Pacific population winters in the waters around the main islands of Hawaii. Activities in both areas, including commercial and recreational vessel traffic, offshore oil and gas development, sport and commercial fisheries, and coastal development present threats to this species.

In Alaska, 20 to 25 humpback whales were observed each year in Glacier Bay National Park; however, the number of whales and the length of time spent in the Bay dropped in 1978 and 1979. The National Park Service determined that increasing vessel traffic might have been partially responsible for this situation and established emergency regulations to restrict vessel traffic. In 1981, Congress appropriated special funds to the National Park Service to address the problem, and the Service transferred the funds to NMFS to carry out the studies.

Results of studies made in 1981 and 1982 on humpback whale-prey relationships, vessel effects on humpbacks, and the acoustical environment of Glacier Bay compared to nearby areas where the whales occur have been presented in final reports by the contractors. Prey studies showed a high correlation between whale distribution and prey abundance. In 1982, one group of whales fed most of the summer in Bartlett Cove, one of the busiest and noisiest parts of

Glacier Bay. Behavior studies indicated that humpback whales showed some response to vessels that were up to 3km away, but responses were of short duration. Acoustic studies showed minor differences between Glacier Bay and other study areas. In 1982, more whales were present in the Bay than in the previous four years, indicating the humpback whales may be reoccupying that area.

The NMML is collecting and analyzing sighting data from the Platform of Opportunity Program (POP); photographic identification of whales to provide information on distribution, abundance and movements; and a literature review of humpback whale feeding habits and behavior. The Auke Bay Laboratory continued its study of prey resources in Glacier Bay and other areas nearby.

Northern Fur Seals - Alaska

Under the Fur Seal Act, NMFS is responsible for managing the annual commercial harvest of northern fur seals on the Pribilof Islands in Alaska. The U.S. Government employs Aleut residents of the Islands to harvest the seals. During the 1983 five-week commercial harvest on St. Paul Island, 25,728 sub-adult male fur seals were taken.

NMFS has received a petition from the Humane Society of the United States to list the North Pacific fur seal as a threatened species under the Endangered Species Act. The Assistant Administrator for Fisheries determined that the petition included substantial information which indiciated that the petition action may be warranted. Therefore, NMFS will review the status of the North Pacific fur seal to determine if it needs to be listed as threatened. Comments and information have been solicited through a Federal Register notice.

A moratorium on commercial harvesting continued on St. George Island although the North Pacific Fur Seal Commission agreed to allow St. George residents an increased number of seals over past years for subsistence. The subsistence harvest of 500 sub-adult male seals on St. George Island in July and August supplemented the fur seal meat shipped to St. George from the commercial harvest on St. Paul.

The population of fur seals in the Pribilof Islands is declining at the rate of 4 to 8 percent per year. Studies on potential causes of the decline are continuing. Studies

indicate that entanglement with debris, such as trawl nets, may be one of the factors in this decline.

Biological information collected by the NMML on fur seals of the Pribilof Islands of St. Paul and St. George in 1982 included determining the age of fur seals harvested, the number of adult males on the rookeries and hauling grounds, and the number of pups and older seals that died on the rookeries and adjacent beaches. In 1983, approximately 166,000 pups were born on St. Paul Island.

Behavioral research on St. George Island emphasized repeating the baseline measurements made in 1974. A broad range of behavioral topics was studied on two rookeries to assess the behavioral changes that have accompanied changes in adult sex ratio. The same measures were made at St. Paul Island for comparison. More measures of diving behavior were made to determine the effect of years and time of season on the diving behavior of known individuals. A new series of experiments was begun on the balance between female gregariousness and aggression, and on the male's effect on this balance. Finally, a study was begun on the land/sea movements of known age juvenile males. Newborn seals were tagged to provide identifiable subjects for future research.

Dall's Porpoise

Under a permit issued by NMFS, the Japanese salmon mothership fishery is permitted to take 5,500 Dall's porpoises annually inside the U.S. fishery conservation zone (FCZ). Based on our estimates, the total take in 1983 was 2,906 inside the FCZ. Marine mammals, primarily the Dall's porpoise, are taken during commercial gillnet operations by Japanese fishing vessels both in and out of the FCZ in the North Pacific Ocean and Bering Sea.

In 1983, NMFS monitored the incidental take by the Japanese with U.S. observers aboard catcherboats while the mothership fleets operated inside the FCZ and observers from Japan Fisheries Agency aboard catcherboats both inside and outside the FCZ. Observers also collected data on the incidental take of chinook salmon and steelhead trout during gillnet operations and on seabird entanglements. A cooperative research program with the U.S. Fish and Wildlife Service on the incidental take of seabirds during this fishery implemented in 1982 was continued in 1983.

The present Memorandum of Understanding between the United States and Japan concerning the incidental take of marine mammals ends on June 9, 1984. Discussions are proceeding to implement a new MOU that will be in effect until 1987.

Scientists from the NMML are continuing the research programs initiated in 1978 under the MOU and the MMPA general permit. In 1983, a U.S. biologist was on board each of the Japanese salmon motherships to collect biological samples and data from all incidentally taken marine mammals returned to the motherships. Japanese nationals collected samples from porpoises taken north of the FCZ. A study was made in Prince William Sound, Alaska, on the response of Dall's porpoise to a survey vessel. This study will continue in 1984 to allow a better estimate of population abundance. Studies were also initiated to determine whether separate populations on Dall's porpoise are present throughout the species range.

Southeast Region (Management)
Southeast Fisheries Center (Research)

Atlantic Bottlenose Dolphin

The popularity of the bottlenose dolphin for public display prompted the Marine Mammal Commission to recommend that NMFS set an annual quota for the number of animals authorized to be removed from populations in the Southeast Region for scientific research and public display. The number removed during any calendar year cannot exceed two percent of the minimum population in a specific location.

The Southeast Region regulates the taking under permits; all permit holders authorized to take dolphins from the region are required to consult with the Regional Director about specific locations of take. At this time, taking is authorized only from the areas where quotas have been set and only until these quotas are reached. No more than one-half of the animals removed annually from an area may be female. Also, current permits do not allow dolphins less that 6.5 feet long to be taken.

The Center continues to assess the population of the bottlenose dolphin. The goals of the research on bottlenose dolphin are (1) to provide estimates of the abundance and live-capture quota recommendations for the stock(s) of this species occurring in southeastern U.S. jurisdictional waters; (2) to determine the dynamics and discreteness of

along-shore and inshore-offshore populations; and (3) to determine the validity of the 2 percent live-capture quota rule recommended by the Marine Mammal Commission. See Table 13 in the Appendix for population estimates.

Research at the Center's Mississippi Laboratory included the use of cryogenic branding to examine herd associations and to determine the discreteness of localized populations of bottlenose dolphins. Research at the Miami Laboratory focused on estimating abundance, establishing live-capture quota recommendations, making aerial sampling surveys using photogrammetric studies to estimate vital rate parameters and examining the degree of genetic variability between along-shore and inshore-offshore populations.

In Indian River, Florida, and Mississippi Sound, bottlenose dolphins were marked (freeze-branded) for field studies. In the Indian River, a resighting survey documented the continuing presence of dolphins freeze-branded in 1979, 1980, and 1981. In Mississippi Sound, resighting surveys were continued all year and four additional dolphins were freeze-branded.

An aerial photogrammetric survey was made off Cape Hatteras, N. Carolina. Over 2,000 images were obtained of 80 observations of this species, totaling 2,160 individuals. This study was made to obtain precise and accurate imagery of this species so that estimates can be made of the relative age/length distributions of the populations sampled.

When the last localized aerial surveys were completed of inshore priority areas, an effort was made to estimate the density distribution and abundance of bottlenose dolphins in the Gulf of Mexico. The first region sampled was the northwestern Gulf encompassing all surface waters from the coast including embayments and estuaries, to 5 nautical miles beyond the surface projection of the 100 fathom isobath and along the coast from the mouth of the Rio Grande to the Mississippi River delta. Three of four seasonal aerial surveys have been completed in the northwestern Gulf. After a full year of sampling has been completed in this part of the Gulf, sampling will begin in the northeastern Gulf.

Whale watchers record a humpback whale vertically lunge feeding on Jeffrey's Ledge off Massachusetts. Photo by Karen Smyth, Cetacean Research Unit, Gloucester Fisherman's Museum, Gloucester, Mass.

Northeast Region (Management)
Northeast Fisheries Center (Research)

The Region and Center have established a coordinated management/research program for cetaceans and pinnipeds in the northwest Atlantic.

The Region is concerned about increased commercial and recreational vessel activity in the vicinity of endangered whales. The rapid increase in these activities in New England waters and the accompanying potential for adverse effects to endangered species and/or their environment will be addressed through a coordinated approach of management, enforcement, and research efforts. The Region will distribute whale watch guidelines developed for specific use in New England waters and which should result in a more knowledgeable public. Selected use of enforcement efforts and investigation of research methods to determine the cumulative effect of these activities on marine mammals will complete the coordinated approach to this problem in the Northeast.

Cetaceans

The final report of the three year (1979--1982) CETAP (Cetacean and Turtle Assessment Program) survey has been completed and is being used to characterize cetacean distribution, abundance, and movement patterns in the western North Atlantic from Cape Hatteras north to the Gulf of Maine.

Over the past few years, the Region and Center have funded several research studies not covered by CETAP including the following:

- A characterization of habitat and distribution, an estimate of population size, and an assessment of the impact of human activities on the harbor porpoise in the Gulf of Maine.

- A continuing study on the distribution and abundance of the North Atlantic right whale in the lower Bay of Fundy.

- Studies on the behavior of humpback whales and their use of the Cape Cod Bay/Stellwagen Bank area and the Mona Passage, Puerto Rico.

- Calculations of biomass and energy requirements of the cetacean component of the northeast United States outer continental shelf waters.

- Collection of skin samples to determine the sex of individual humpback whales in the vicinity of Stellwagen Bank off the coast of Massachusetts.

- Collection and maintenance of humpback whale fluke photographs to identify individual animals.

- A study of distribution, incidental and subsistence take, habitat, age and growth, migration, and human effects on the harbor porpoise in the Northwest Atlantic.

- The continued use of Northeast Fisheries Center ships as a platform of opportunity for observers from the Manomet Bird Observatory to gather and maintain seabird, marine mammal and sea turtle sightings of all species between Nova Scotia and Cape Fear, North Carolina.

Pinnipeds

The Center has continued to fund a study by the University of Maine on the abundance, distribution, and habitat use patterns of the harbor seal in the Gulf of Maine. This comprehensive tagging and aerial census effort will provide baseline data concerning this species. Development of procedures to assess marine mammal gillnet fishing interactions in the New England waters is also included in this study by the University of Maine.

In addition, the Manomet Bird Observatory is studying the harbor seal in Massachusetts waters. This research will provide information on the distribution and abundance of harbor seals, determination of the feeding locations and the food requirements of th harbor seal population, monitor the rate of increase of the wintering population through daily counts at Stage Point, Manomet, Mass., and determine, through radio-telemetry, local and widespread movements of harbor seals in the waters adjacent to Cape Cod, Mass.

Aerial surveys of the Nantucket Sound grey seal population were made to assess the stock size, composition, and reproductive success. Habitat and other environmental conditions including weather and human disturbance were also monitored.

Part IV - STATUS OF STOCKS REPORT FOR MARINE MAMMALS

Introduction

The system used by scientists to classify plants and animals begins with the major category, kingdom, and is followed by phylum, class, order, suborder, family, genus, and species. The Department of Commerce is responsible for the order Cetacea (whales, dolphins, and porpoises) and the seals and sea lions of the suborder Pinnipedia which is a part of the order Carnivora. This report describes the orders, suborders, families and species of these groups. It also reports the estimated population numbers of these animals and their relative status in the ecosystem. Of about 108 species of pinnipeds and cetaceans throughout the world, status reports have been prepared for 52 species that are of primary concern to the United States including marine mammals commonly found in the fisheries conservation zone, the Antarctic, eastern tropical Pacific, those managed by the International Whaling Commission, and species that have been imported under a scientific research or public display permit.

Although the study of these animals in their natural habitat is difficult, several other methods are used. One method is to examine the remains of animals that have been killed or stranded. In recent years, new methods of statistical analysis have allowed scientists to estimate the past abundance and distribution of some groups and to compare these to present day populations. Also, in the past 25 years, the study of fossil history has given scientists a better understanding of the development of marine mammals.

Some marine mammals populations are healthy and stable; others have not recovered from previous years of intense exploitation. As a group, pinnipeds seem to have fared better than the cetaceans. Whales listed as endangered under the U.S. Endangered Species Act are the blue whale, bowhead whale, fin whale, gray whale, humpback whale, right whales, sei whale, and sperm whale. Three seals, the Caribbean monk seal, the Hawaiian monk seal, and the Mediterraean monk seal are on this list. The Convention on

International Trade in Endangered Species of Wild Fauna and Flora (CITES) controls the trade of all plants and animals that have been given protected status by the Convention. This international body has restricted trade for all cetaceans and 13 species of pinnipeds.

Accounts of the following species are included in this report.

Order: Carnivora
Suborder: Pinnipedia

Family: Otariidae

California sea lion
(*Zalophus californianus*)

Northern (Stellar) sea lion
(*Eumetopias jubatus*)

Northern (Alaska) fur seal
(*Callorhinus ursinus*)

Guadalupe fur seal
(*Arctocephalus townsendi*)

Family: Phocidae

Largha seal
(*Phoca largha*)

Harbor (Common) seal
(*Phoca vitulina*)

Ringed seal
(*Phoca* (=*pusa*) *hispida*)

Harp seal
(*Phoca groenlandica*)

Family: Phocidae (con't)

Gray seal
(*Halichoerus grypus*)

Bearded seal
(*Erignathus barbatus*)

Hawaiian monk seal
(*Monachus schauinslandi*)

Crabeater seal
(*Lobodon carcinophaga*)

Ross seal
(*Ommatophoca rossii*)

Leopard seal
(*Hydrurga leptonyx*)

Weddell seal
(*Leptonychotes weddelli*)

Northern elephant seal
(*Mirounga angustirostris*)

Ribbon seal
(*Phoca* (=*Histriophoca*) *fasciata*)

Order: Cetacea

Suborder: Mysticeti
Family: Eschrichtiidae

Gray whale
(Eschrichtius robustus)

Family: Balaenopteridae

Minke whale
(Balaenoptera acutorostrata)

Sei whale
(Balaenoptera borealis)

Bryde's whale
(Balaenoptera edeni)

Fin whale
(Balaenoptera physalus)

Blue whale
(Balaenoptera musculus)

Humpback whale
(Megaptera novaeangliae)

Family: Balaenidae

Right whale
(Balaena glacialis)

Bowhead whale
(Balaena mysticetus)

Suborder: Odontoceti
Family: Delphinidae

Rough-toothed dolphin
(Globicephala melaena)

Bottlenose dolphin
(Globicephala macrorhynchus)

Spinner dolphin
(Orcinus orca)

Family: Delphinidae (con't)

Spotted dolphin
(Stenella attenuata)

Atlantic spotted dolphin
(Stenella plagiodon)

Striped dolphin
(Stenella coeruleoalba)

Common dolphin
(Delphinus delphis)

Fraser's dolphin
(Lagenodelphis hosei)

Atlantic white-sided dolphin
(Lagenorhynchus acutus)

Pacific white-sided dolphin
(Lagenorhynchus obligquidens)

Northern right whale dolphin
(Lissodelphis borealis)

Risso's dolphin
(Grampus griseus)

Melon-headed whale
(Peponocephala electra)

Pygmy killer whale
(Feresea attenuata)

False killer whale
(Pseudorca crassidens)

Long-finned pilot whale
(Steno bredanensis)

Short-finned pilot whale
(Tursiops truncatus)

Killer whale
(Stenella longisrostris)

Family: Phocoena

Harbor porpoise
(*Phocoena phocoena*)

Dall's porpoise
(*Phocoenoides dallii*)

Family: Physeteridae

Sperm whale
(*Physeter catodon*)

Pygmy sperm whale
(*Kogia breviceps*)

Dwarf sperm whale
(*Kogia simus*)

Family: Monodontitae

Beluga, belukha, white whale
(*Delphinapterus leucas*)

Narwhale
(*Monodon monoceros*)

Family: Ziphiidae

Baird's beaked whale
(*Berardius bairdii*)

Northern elephant seals and California sea lions crowd the sand pit at Point Bennett, San Miguel Island, Calif. Photo by Dana J. Seagars, Southwest Region, NMFS.

Order Carnivora

Suborder Pinnipedia

Seals, Sea Lions, and Walrus

Pinnipeds (fin-footed animals) were once classified as a separate order of mammals. Based on information published 10 years ago, they are classified now as a diverse group of carnivores (flesh-eating animals) that have adapted to marine life. The ancestors of sea lions and fur seals appeared 22 million years ago and are thought to be close to the ancestors of a group that preceded the modern bear. Hair (true) seals are considered to be between 14 to 16 million years old and are tied closely to the carnivores that preceded the otter and weasel. Walruses, a member of the suborder Pinnipedia, are under the jurisdiction of the Department of the Interior.

Pinnipeds have adapted several basic mammalian characteristics to a marine existence. They maintain a relatively constant body temperature similar to other mammals including humans. In fur seals, the constant body temperature is made possible by a coat of short stiff hairs over a heavy underfur while most other pinnipeds depend on a thick layer of blubber beneath the skin. This layer is an energy reservoir as well as a protective insulator in maintaining body temperature. Pinnipeds have adapted to diving by reserving oxygen for the brain and heart. Immediately on diving, their heart beat slows to 20 to 25 percent of its rate at the surface. During diving, the digestive system does not function at full capacity and the muscular system operates on a supply of oxygen stored in the tissue. One species can dive and remain submerged for over an hour, and several other species can dive for 20 to 30 minutes.

Pinnipeds are not entirely pelagic and must spend some time each year on land or a solid place such as the ice pack. This is because successful births and nursing of the pups occur only along shorelines or ice packs. Like other mammals, they nourish their young with rich milk. Delayed implantation, or the capacity to postpone the development of an embryo after conception, is another adaptation seals have made to the marine environment. This ability to cycle the gestation and birth of the pup is known in other species of mammals as well, notably weasels and bears. Gestation, the time from conception to birth, reaches a finely timed coordination in pinnipeds; females of several species give

birth within one day after coming ashore, become impregnated within a few days of giving birth, nurse the newborn for a few weeks and return to the water with the next year's pregnancy.

POPULATION ESTIMATES: PINNIPEDIA[1]

Name Order: Carnivora Suborder: Pinnipedia Family: Otariidae	Estimated World Total	Comparison of Population Data[2]	Arctic Circum-polar	PACIFIC				ATLANTIC				SOUTHERN OCEAN			
				Asia	Alaska	North America	South America	North America	Europe	Africa	South America	New Zealand	Aus-tralia	Sub Ant-arctic	Ant-arctic
California sea lion (Zalophus californianus)	177,000	complete				157,000	20,000								
Northern sea lion (Eumetopias jubatus)	230,000/ 240,000	complete		20,000/ 30,000	200,000	10,000									
South American sea lion (Otaria flavescens)	273,000	complete					228,000				45,000				
Australian sea lion (Neophoca cinerea)	2,000/ 3,000	complete											2,000/ 3,000		
Hooker's (New Zealand) sea lion (Phocarctos hookeri)	6,000											6,000			
Alaska or Northern fur seal (Callorhinus ursinus)	1,332,000	best		463,000	865,000	4,000									
Guadalupe fur seal (Arctocephalus townsendi)	1,000	complete				1,000									
Juan Fernandez fur seal (Arctocephalus philippii)	705/ 750	complete					705/ 750								
Galapagos fur seal (Arctocephalus galapagensis)	1,000/ 5,000	incomplete					1,000/ 5,000								
South American fur seal (Arctocephalus australis)	346,000	incomplete					294,000				52,000				
Cape (South African) and Australian fur seals (Arctocephalus pusillus)	870,000	complete								850,000			20,000		

[1] All species of pinnipeds are included in the tables because of available data.
[2] Best = the most comprehensive estimates throughout the range of the species.
Complete = good population estimates throughout the range of the species.
Incomplete = population estimates only in parts of the range of the species.

POPULATION ESTIMATES: PINNIPEDIA Continued

Name Order: Carnivora Suborder: Pinnipedia Family: Otariidae Continued	Estimated World Total	Comparison of Population Data	Arctic Circum-polar	PACIFIC				ATLANTIC				SOUTHERN OCEAN			
				Asia	Alaska	North America	South America	North America	Europe	Africa	South America	New Zealand	Aus-tralia	Sub Ant-arctic	Ant-arctic
New Zealand fur seal (*Arctocephalus forsteri*)	58,000	complete										25,000		33,000	
Antarctic (Kerguelen) fur seal (*Arctocephalus gazella*)	350,000	complete												350,000	
Subantarctic fur seal (*Arctocephalus tropicalis*)	122,000	incomplete								113,000				9,900	
Order: Carnivora Suborder: Pinnipedia Family: Phocidae															
Largha seal (*Phoca largha*)	335,000/ 450,000	incomplete		135,000/ 200,000	200,000/ 250,000										
Harbor (Common) seal (*Phoca vitulina*)	390,000/ 413,500	incomplete		10,000/ 15,000	260,000	42,000		30,000/ 45,000	48,000/ 51,500						
Ringed seal (*Phoca* [= *pusai hispida*)	6/7 Million	best	6/7 Million												
Baikal seal (*Phoca sibirica*)	40,000/ 50,000	complete		40,000/ 50,000											
Caspian seal (*Phoca caspica*)	500,000 600,000	complete		500,000/ 600,000											
Harp Seal (*Phoca groenlandica*)	1,650,000/ 3,250,000	complete						1,050,000/ 2.1 mil	600,000/ 1,150,000						
Ribbon seal (*Phoca* [= *histriophocai fasciata*)	200,000/ 250,000	complete	200,000/ 250,000												
Gray seal (*Halichoerus grypus*)	101,000/ 133,000	complete						24,000/ 55,000	77,000/ 78,500						

POPULATION ESTIMATES: PINNIPEDIA Continued

Name Order: Carnivora Suborder: Pinnipedia Family: Phocidae Continued	Estimated World Total	Comparison of Population Data	Arctic Circum-polar	PACIFIC				ATLANTIC				SOUTHERN OCEAN			
				Asia	Alaska	North America	South America	North America	Europe	Africa	South America	New Zealand	Aus-tralia	Sub Ant-arctic	Ant-arctic
Bearded seal (*Erignathus barbatus*)	exceeds 500,000	incomplete		exceeds 500,000											
Hooded seal (*Cystophora cristata*)	500,000/ 600,000	complete							500,000/ 600,000						
Mediterranean monk seal (*Monachus monachus*)	500	best							500						
Caribbean monk seal (*Monachus tropicalis*)	extinct or near entinct	best						+[3]							
Hawaiian monk seal (*Monachus schauinslandi*)	500/ 1,500	complete				500/ 1,500									
Southern elephant seal (*Mirounga leonina*)	600,000	complete									300,000			300,000	
Northern elephant seal (*Mirounga angustirostris*)	100,000	best				100,000									
Crabeater seal (*Lobodon carcinophaga*)	15,000,000	best													15,000,000
Ross seal (*Ommatophoca rossii*)	220,000	complete													220,000
Leopard seal (*Hydrurga leptonyx*)	500,000	complete													500,000
Weddell seal (*Leptonychotes weddellii*)	750,000	complete													750,000

[3] + = Although a population occurs in this area, the numbers are either unknown, or the data are not available.

Family Otariidae

Eared Sea Lions and Fur Seals

Our knowledge of the history of sea lions and fur seals is based on fossil deposits found along the edge of the North Pacific Ocean from California to Japan. Sea lions and fur seals have relatively short, furled external ears. They are able to rotate both the fore and hind flipppers which allow them to stand, run, and climb. Since they have a polygamous (several mates) social structure, breeding males establish territories and copulate with females that have previously given birth to pups. After the breeding season, males return to sea and feed while females make feeding trips to sea and return to nurse pups on land. Depending on the species, pups are usually weaned within 3 to 12 months after birth. The blubber layer of sea lions and the underfur beneath a strong net of guard hairs of fur seals provide insulation in extremely cold latitudes. Cold oceanic currents explain the presence of animals with heavy fur coats in tropical latitudes where during the mid to late 1800s, some species of fur seals were reduced to remnants of their former populations due to the fur traders' desire for their pelts.

California Sea Lion

Zalophus californianus

The three subspecies of the California Sea Lion inhabit the Pacific Ocean from the Galapagos Islands to Baja California to British Columbia. A form in the Sea of Japan may be extinct. The California population, which is the largest, breeds along the Channel Islands and oceanic islands off Mexico. Adult males reach 7.2 ft in length and weigh 600 lbs; the females are 6 ft long and weigh 200 lbs. Newborn pups weigh 11 to 13 lbs. After the breeding season, males migrate as far north as Washington and British Columbia. Females and juveniles frequent the coastal waters of California and Mexico. Males defend their territories in the rookery areas while the females move freely from one territory to the next. Births occur from mid-May through June off California and from October to December in the Galapagos Islands. Gestation lasts 11.5 to 12 months, and the pups may nurse for more than a year; the exact age of weaning varies. The females breed about 4 weeks after giving birth.

This species adapts well to captivity and is the most commmonly exhibited marine mammal species in the world. Under special conditions, it breeds well in captivity. Longevity records of 20 to 25 years are common. In the wild, this species feeds both day and night on squid, Pacific whiting, sardines, and opaleye fish. Killer whales and sharks prey on California sea lions.

The California population of sea lions numbers about 74,000 and the Mexican population about 83,000. The Galapagos Island population has stabilized at about 20,000 animals after recovering from sealing operations at the turn of the century.

In 1983, there was a substantial decrease in pup production of northern fur seals and California sea lions in the Channel Islands, Calif. and in sea lions and fur seals in the Galapagos Islands. This decrease is being attributed to El Nino, the weather phenomenon of 1982/83 which dramatically reduced the availability of prey species for the nursing seals and sea lions. It has been reported that the females' usual one or two day feeding forages at sea turned into five or six day trips that resulted in weight loss and stress.

Northern (Steller) Sea Lion

Eumetopias jubatus

Northern sea lions are found in a large arc over the Pacific that includes the Sea of Japan, the Bering Sea, Aleutian Islands, Gulf of Alaska and the Channel Islands off California. They are the largest otariid; adult males average about 2,000 lbs, and adult females about 660 lbs. The males are about 10 ft long; females are 6 to 7 ft long. Newborn pups are about 3.5 ft long and weigh 35 to 50 lbs. The young are born from mid-May through June after a one year gestation period that includes a delayed implantation of about three months. The young are nursed for 8 to 11 months, and occasionally both a yearling and newborn are seen suckling from the mother.

Pup mortality may be high in some rookeries due to males moving rapidly about trying to retain 10 to 20 cows in their territory. Groups of non-breeding bachelors are found at the edges of the main rookery areas. Males in the northern portion of the range migrate north after the breeding season. Females mature sexually at 4 to 5 years. Males mature at age 5 to 7 although they do not become competitive breeders defending territories until 7 to 9 years of age. Territorial bulls are active breeders probably for only 3 to 5 years before they retire to bachelor groups. Northern sea lions have been known to live as long as 23 years. They feed on a wide variety of cephalopods and fish including walleye, pollock, Pacific cod, herring, shad, and lamprey. Killer whales sometimes prey on sea lions.

The Alaskan population is estimated at over 200,000 animals. The U.S.S.R. population is thought to be between 20,000 to 30,000. The British Columbia population is about 5,000; Oregon, about 2,000; and California, about 3,000.

Northern Fur Seal

Callorhinus ursinus

The Northern fur seal is one of the best known species of pinnipeds. Its biology and management have been the focus of an international treaty for over 75 years. The females and juveniles are highly migratory and range in a great arc across the North Pacific from the Sea of Japan through the southern Bering Sea down to the Channel Islands (San Miguel Island) off southern California. With the exception of the San Miguel breeding population, the animals migrate north in June to several island complexes. The largest numbers congregate on the Pribilof Islands, eastern Bering Sea and lesser numbers on the Commander Islands, Sea of Okhotsk and Kuril Island in the western North Pacific.

As the females come ashore, they are met by the breeding territorial bulls who attempt to keep a group of females close to them. A few days after coming ashore, a pregnant female will give birth to a single black pup which will weigh about 12 lbs. The pups are nursed for about four months and stay together in groups while their mothers are feeding at sea. In October, the seaward migration begins. Most fur seals do not come ashore again during their first two years. Northern fur seals have a maximum life span of about 25 years. Females mature sexually between 3 and 4 years of age and reach a breeding peak of a pup per year between 7 and 14 years of age. The gestation period is about one year and includes a delayed implantation of about 4 months. Males mature sexually at 4 to 5 years but do not become effective breeders until 9 to 15 years old. Adult males are about 6.5 ft long and weigh up to 600 lbs; the females weigh up to 110 lbs and are about 4.5 ft long. Fur seals eat herring, anchovy, walleye pollock, Pacific whiting, capelin, salmon, and squid. Killer whales and sharks prey on northern fur seals; northern sea lions prey on fur seal pups.

The number of northern fur seals declined during 1977-83 for reasons which are not clear from research conducted to date. The number of sub-adult males harvested on the Pribilof Islands and number of pups born on both the Pribilof and Robben Islands declined including the numbers of territorial and idle adult males on the Pribilof Island, San Miguel Island, and most of the Soviet Islands. The Commander Islands appear to be the only major breeding area which is not exhibiting marked long term declines. The number of pups born on the Pribilof Islands in 1980 was less

than 50 percent of the levels in the 1940s and early 1950s. On Robben Island, the number of pups born in 1980 was less than 50 percent of the number born in the mid-1960s. Within the last five years, a very small breeding population (less than 50 pups annually) has been established on Bogoslof Island in the Bering Sea.

A commercial harvest of females on the Pribilof Islands conducted during 1956 through 1968 reduced the number of females, and, as a result, the number of pups born on St. Paul Island decreased from about 450,000 in the mid-1950s to less than 250,000 in the late 1960s. This led to a reduction in the recruitment of subadult males of harvestable ages and, therefore, a decline in the harvest. Overall, the number of males harvested on St. Paul Island has declined since the mid 1950's. From 1976 to 1983, the number of pups born on St. Paul Island declined from about 298,000 to about 166,000 following a slight increase during 1968-76 following the harvest of females. On Robben Island, the numbers of pups born declined from levels as high as 60,000 in the mid-1960s to about 22,000 in 1980. No comparable trends were observed on the Commander Islands. The total population associated with San Miguel Island, California, has increased although the number of pups born in 1983 decreased from the number born in previous years.

There are an estimated 865,000 animals in Alaskan waters; 463,000 in Soviet waters; and 4,000 in southern California waters.

Guadalupe Fur Seal

Arctocephalus townsendi

After 1923, the Guadalupe fur seal generally was regarded as extinct. In 1949, one adult male was seen on San Nicolas Island off California, and a breeding colony was discovered on Guadalupe Island off Mexico in 1954. Observers have counted a population of 1,000 fur seals on Guadalupe Island along with occasional sightings of animals in the offshore waters of Baja California and southern California. Since 1968, small numbers of non-breeding animals, usually sub-adult males, have been observed on San Miguel in the Channel Islands off California. Estimates of the population prior to commercial sealing are as high as 200,000 on Guadalupe Island alone.

The estimated length for adult males is about 6.5 ft; 4.5 ft females; and 2 ft for newborn pups. Adult males weigh about 300 lbs and females about 100 lbs. Pups are born in June and July when the adult males establish breeding territories in caves and rocky recesses.

The small population on Guadalupe Island has survived as a breeding colony largely due to its inaccessible and usually unnoticed rookery sites. A few non-breeding individuals have been sighted on San Miguel Island, California, each year since 1968.

Harbor seal pup on San Miguel Island, Calif. Photo by Dana J. Seagars, Southwest Region, NMFS.

Family Phocidae

Hair (True) Seals

Hair seals are relatively young in the fossil record and are not as well known as the otariids. Their development probably took place in the North Atlantic Ocean basin. Their modern range in the northern and southern hemispheres is a recent dispersal thought to have preceded the pleistocene ice ages. Hair seals have smooth, round earless heads. The newborn phocid has a coat of lanugo hair which in several northern hemipshere species is white. A lanugo coat, or birth hair, provides warmth and protection in the first weeks of life. This coat can be also gray or black. Retaining a white coat after birth is thought to be an adaptive response to their habitat that protects them from predators. In the northern hemisphere, polar bears feed on both the young and adults on ice and at sea. For some species, this predatory pressure is a substantial factor in their reproductive success each year. The general social structure of hair seals is monogamous (one mate) with little atttempt by males to hold territories of females. Exceptions are found in the polygamous organization of gray and Weddell seals and in the territorial defense of the elephant seals (genus Mirounga).

The limb structure, and, therefore, the locomotion, of hair seals is markedly different from the eared seals. The hind flippers of the hair seals do not extend at an angle from the body, but are held in a straight line axis. Their locomotion on land resembles an inch worm .... when the weight of the rear part of the body is thrown forward, it gives the animal a rippling effect as it moves.

Largha (Spotted) Seal

Phoca largha

Largha seals are found in the Beaufort, Chukchi, and Okhotsk Seas and northwestern parts of the Yellow Sea off Japan. During the winter and early spring, they associate closely with the ice pack and large ice flows on which they depend for a place to give birth and nurse their young. As the ice retreats in summer and autumn, they move north and form large groups on coastal shores.

The newborn have a white wooly lanugo coat and weigh about 15 to 22 lbs. Gestation is about 10.5 months and pups are nursed for one month. The pups are usually born from late March through mid April. Males mature sexually between 4 and 5 years, females between 3 and 4 years. Largha seals are known to live for 35 years. Males grow to 5.6 ft in length while the females are slightly smaller and average about 5 ft long. Adults weigh between 200 to 250 lbs. Largha seals feed on a variety of fish, squid, and crustacea. Polar bears, walrus, foxes and killer whales prey on largha seals.

The Bering Sea population (including Alaskan waters) is estimated at 200,000 to 250,000 animals. The total world population is estimated to be 335,000 to 450,000 animals. There are regulated hunts for largha seals in U.S.S.R. waters.

Harbor Seal

Phoca vitulina

The three commonly recognized subspecies of harbor seals are widely dispersed in the Atlantic, Arctic, and Pacific Ocean basins. There are a few populations in fresh water lakes. Harbor seals range from temperate and semi-tropical latitudes (Baja California) to above the Arctic circle (Ellesmere Island and Hudson's Bay, Canada). Generally, harbor seals move ahead of advancing ice packs. Although harbor seals are generally solitary animals, they gather at feeding sites and haul out areas. There are no terrestrial territories during the breeding season.

The females give birth to a single spotted pup after a gestation period of 10.5 to 11 months that includes a delayed implantation of 2 months, and breeding occurs in the water. The young nurse for 4 to 6 weeks. Females mature sexually at 2 to 5 years of age, males between 3 to 6 years. Lengths and weights of adults vary depending on the area they inhabit. Adults range from 3.6 to 6 ft in length and weigh between 100 and 230 lbs. Pups are from 2.5 to 3 ft long and weigh 20 to 25 lbs at birth. Harbor seals feed on octopods, squid and a variety of fish including herring, smelt, salmon, and cod. Dives to depths of 1,000 ft and for 23 minutes have been recorded. Harbor seals live up to 40 years. Eagles, foxes, and coyotes prey on the newborn and young; sharks, killer whales, northern sea lions, bears, and walruses prey on the older animals.

Harbor seals are considered abundant throughout most of their range. Populations have increased substantially in the last 10 years. European populations are estimated at 48,000 to 51,500 animals, eastern Canada at 20,000 to 30,000, and U.S. Atlantic waters at 10,000 to 15,000. At least 312,000 to 317,000 animals inhabit the Pacific Ocean although actual populations in this region may be higher.

Ringed Seal

Phoca hispida

The ringed seal, found on the pack ice of the Arctic basin in summer and among the pressure ridges of the fast ice near the shore in winter, is probably the most abundant seal in the northern hemisphere. It is the only pinniped species which attempts to provide the newborn with a protected hiding place, or birth lair. Females give birth to a single white coated pup in the crevices and cracks of the fast ice pressure ridges or in drifts of frozen snow. They maintain breathing holes near these lairs while nursing their pup for 4 to 6 weeks. The pups are 1.6 to 2 ft long at birth and weigh between 9 and 11 lbs. Males mature sexually at 7 years and females at 5 to 8 years. Gestation lasts for 10.5 to 11 months including a delayed implantation period of 3.5 months. Breeding occurs in the first month after the female gives birth.

The size and weight of the six recognized subspecies of ringed seals vary considerably. Adults average about 4.5 ft in length and weigh 143 lbs. The diet of the ringed seal depends on the food available given ice conditions. In the autumn and winter, they feed primarily on polar cod; in the spring and summer, they feed on plankton and crustaceans. Arctic foxes prey on the pups, and polar bears feed on pups and adults.

This species is hunted for subsistence needs throughout most of its range. The estimated population number of 6 to 7 million ringed seals makes this species the most abundant pinniped in the Arctic basin.

Harp Seal

Phoca groenlandica

There are three groups in the world population of harp seals including one in the White Sea off the Soviet Union, a group in the Norwegian Sea around the Labrador Coast, and one in the Gulf of St. Lawrence in Canada. The Northwest Atlantic stock may be genetically distinct from the other stocks. The harp seal associates with the pack ice of the North Atlantic and adjacent Arctic Ocean. Most of the known biology of this species is based on information obtained when the animals congregate on the ice packs for pupping and breeding. Thousands of females can be found some distance away from the ice-water edge among the pressure ridges and hummocks of the large ice floes where the pups are born and where there is some protection from wind and snow. Most births occur in the last week of February and first week of March after a gestation period of 11.5 months that includes a delayed implantation of 4.5 months. Pups are born with a white lanugo coat which molts in about 4 weeks to a spotted gray coat. Nursing lasts 10 to 12 days with the protective mother visiting the pup through breathing holes maintained in the ice.

Harp seals are about 3 to 3.5 ft long at birth and weigh about 22 lbs. Adults males are about 5.5 ft in length; adult females are 5.3 ft long. Adult weight ranges from 187 to 419 lbs depending on the time of year. Males probably breed with one or a few females. Females mature sexually at about 5 years, males at 6 years. Harp seals may live 35 years or more. They feed on capelin, codfishes, herring, squid, and many species of crustaceans, including shrimp. Sharks, killer whales, and polar bears are known predators of harp seals.

The total world population is estimated to be between 1.6 and 3.2 million animals. The Norwegian (Jan Mayen Island) population is estimated at 500,000 to 1 million, and the White Sea population is estimated at 100,000-150,000 seals. The western North Atlantic population which breeds in the Gulf of St. Lawrence and off Newfoundland is estimated from 1.05 (other than pups) to 2 million animals. Pup production for the Northwest Atlantic stock is estimated to be between 380,000 and 500,000 annually.

The harp seal is hunted for its skins by Canada, Norway and the USSR. In 1971, Canada and Norway agreed to limit the number of seals allowed to be taken in response to

recommendations by a panel of international scientists. From 1977-1983, the quota has been between 170,000 and 186,000 (about 100,000 are pups) annually. The Government of Canada reported a take of 55,914 harp seals for the 1983 season. The annual hunt for the white coats, pups less than three weeks old, did not take place in 1983 and 1984. Along with concerns from environmental groups about the harp seal hunt, there has been a decline in the demand for seal pelts in the traditional European markets. In October 1983, the European Economic Community placed a two-year ban on imports of harp and hooded seal pup products. Recently, about 9,000-10,000 harp seals have been caught incidentally each year in cod fishery gill nets off Norway.

Ribbon seal

Phoca fasciata

The ribbon seal, found in the Bering and Okhotsk Seas and to some degree in the Chukchi Sea, is one of the lesser known seals of the northern hemisphere. It is an animal of the ice pack and floes. The average adult is about 5 ft long and weighs about 150 lbs. Most pups are born on the ice in April. They are about 2.8 ft in length at birth and weigh about 23 lbs. The newborn has a coat of white lanugo hair which is shed within a month of birth. Nursing probably lasts from 3 to 4 weeks. Gestation is about 11 months including delayed implantation. Their life span is between 22 to 26 years. Females mature sexually between 2 to 4 years; males between 3 to 5 years. As the ice pack recedes in spring and summer, ribbon seals return to the open sea. They feed on a variety of fish, squid, and small crustaceans.

From 1961 through 1967, large numbers of this species were taken in the waters off the Soviet Union. In 1968, the take was reduced because of a noticeable drop in the population; by the mid 1970, the numbers were increasing, A small number is being taken by Alaskan natives for subsistence. The north circumpolar population is estimated to be between 200,000 and 250,000 animals.

Gray seal

Halichoerus grypus

This North Atlantic animal is found in temperate and subarctic waters. Three stocks are recognized; western Atlantic (Canada), eastern Atlantic (Iceland, Britain, and Norway), and an ice breeding population in the Baltic Sea. There is a breeding colony of gray seals near Nantucket Island, Masachusetts. Gray seals are large and have a long fleshy nose and fore flippers with long claws which become worn with age. Adults do not migrate, but younger animals scatter over wide areas. One animal tagged in Canada was taken off Norway and animals tagged on Sable Island, Nova Scotia, have been found in New Jersey. Pupping in Canadian waters occurs mostly in January; in Baltic waters, births are generally in February-March; and in Britain, pups are generally born from September to November.

Adult males are about 7 ft long and weigh about 500 lbs. Females are about 6 ft long. The newborn are 2.6 to 3.4 ft long, weigh about 32 lbs, and have a white lanugo coat which they shed in two to three weeks. Females mature sexually in 4 to 7 years; males are similar, but do not hold territories until their 10th year. Mating takes place at the end of the nursing period, usually 3 to 4 weeks after birth. Nursing females do not feed after giving birth until weaning, and all of the energy for milk production comes from metabolism of blubber and other body tissue. Gestation is 11.5 months including a delayed implantation of 3 months. Males 26 years old and females 46 years old have been recorded. One animal lived 43 years in captivity. Gray seals are exhibited in public displays although they do not mix well with other species. They eat halibut, cod, haddock, lamprey, salmon, herring, cephalopods and crustaceans.

The populations of this species are considered to be increasing. Current estimates are 24,000-55,000 for the western Atlantic stock; about 76,000 for the eastern Atlantic stock; and 1,000-1,500 for the Baltic stock. In recent years, some gray seals have been killed to control stock size. About 3,000 seals were taken in Canadian and British waters during 1980. They interact with commercial fisheries by preying on marketable fish, e.g. herring and salmon; damaging fishing gear; and they are the principal transmitter of the codworm to the Atlantic cod.

Bearded Seal

Erignathus barbatus

The bearded seal, the largest phocid in the Arctic Ocean basin, is circumpolar in its distribution. These animals generally associate with the moving pack ice as it advances and recedes each winter and summer. They are solitary animals except when they form small groups in the breeding season. Their ice habitat brings them as far south in the Atlantic Ocean area as the Gulf of St. Lawrence, Canada, Scotland, and Norway, and, in the Pacific, to Hokkaido, Japan. In U.S. waters, they are found in the Beaufort and Bering Seas. They have been observed residing in the fast ice along the shore where they maintain breathing holes.

They share characteristics with walrus such as size, a habit of almost exclusively feeding on bottom dwelling invertebrates, and long bearded whiskers which form a moustache. Both sexes are similar in size averaging about 8 ft in length and 532 lbs in weight. The pups are about 2.6 ft long at birth and weigh about 95 lbs. Pups almost triple their weight after nursing for 12 to 18 days. Breeding occurs in May and the gestation period is 10.5 to 11 months including a delayed implantation of 2.5 to 3 months. Females mature sexually at 5 to 6 years, males at 6 to 7 years. Animals 31 years old have been recorded in one area. Polar bears prey heavily on bearded seals congregating on the ice. Killer whales also prey on this species. There are records of bearded seals being kept in captivity, but they are not common in public displays.

The total population probably exceeds 500,000 animals. About 10,000 to 13,000 animals are taken annually by subsistence hunters in Norwegian, U.S.S.R. and U.S. waters.

Hawaiian Monk Seal

Monachus schauinslandi

The Hawaiian monk seal is one of three species in the genus Monachus. The Caribbean monk seal, *Monachus tropicalis*, is generally considered to be extinct; the last unconfirmed report of 20 animals was in 1967. The Mediterranean monk seal, *M. monachus*, survives in small numbers in separate colonies on the African-Atlantic and European-African Mediterranean coasts. The Hawaiian species, *M. schauinslandi*, is found on Nihoa Island, Necker Island, French Frigate Shoals, Lisianski Island, Laysan Island, Pearl and Hermes Reef, Midway Island, and Kure Atoll, all in the leeward Hawaiian Islands. They are not known to migrate, but they do move among the islands and they are found scattered along sandy beaches and in shoreline vegetation.

Mating takes place in the water; pups are born from December through July with a peak birth time in April and May. Newborns are about 3.3 ft long and weigh between 35 to 37 lbs. Some mature females give birth to pups each year; many give birth every other year. Adult females are about 7.6 ft long and weigh about 600 lbs; males average 7 ft in length and weigh about 380 lbs. Little is known about longevity; however, a 20 year old male has been reported. The monk seal feeds among the coral reefs on a wide variety of fish and invertebrates including eels, octopus, and lobster. A variety of large predator sharks frequent these reefs and attempt to feed on monk seals as evidenced by many animals with large extensive scars. The toxic disease cigutera has been implicated as a mortality factor in this species.

The Hawaiian monk seal is intolerant of human disturbance and readily abandons breeding and haulout areas if not protected. U.S. military installations have restricted movements of personnel to minimize disturbances on these islands. This species, with a population of about 500 to 1,500 animals, is endangered. Currently, NMFS is implementing research and management programs to aid recovery of this endangered species.

Crabeater Seal

Lobodon carcinophaga

The crabeater seal is probably the most abundant species of pinniped in the world. It is an animal of the Antarctic drifting pack ice and is found in greatest abundance at the broken edge of the pack. In the late Antarctic summer when the ice is at its minimum, crabeater seals come close to the shoreline of the continent. There are no known migratory movements for this species, and the forming of groups depends on the advancing and retreating ice pack. As with other Antarctic seals, crabeaters have cusps on each of the premolar and molar teeth in contrast to the cone shaped teeth of other seals. When the upper and lower teeth are brought together, the teeth form a close knit filter structure. The major food of this species is krill (tiny shrimp-like organisms) from the Southern Ocean.

Newborn pups are about 4 ft long and weigh about 44 lbs; the adult males are about 8.4 ft long and weigh about 490 lbs; the females are about 8.6 ft long and weigh 500 lbs. Pups are born in September and October; nursing lasts about one month. The young are born with a light gray lanugo coat and reach adult size in four months. Breeding probably occurs within 2 to 3 weeks after females give birth. Gestation lasts 11 months including a delayed implantation of 2 to 3 months. This species may live as long as 33 years. Predators include killer whales and leopard seals.

The estimated population size of 15 million animals is greater than all the other pinniped species combined.

Ross Seal

Ommatophoca rossii

Although there is considerable knowledge of the biology of Antarctic hair seals, the Ross seal remains one of the least understood pinnipeds. This seal prefers the heavy consolidated ice pack where ice breakers or aircraft are the only means of access. They have large plump bodies with a short wide head that can be pulled into rolls of blubber around the neck, and they make cooing and trilling noises as they lift their head and inflate the throat in a "singing" posture.

Biological data are based on a few specimens. Adult males average a little over 6 ft in length and weigh about 380 lbs; females average about 7 ft long and about 400 lbs. Newborn are abut 3.5 ft long and weigh about 60 lbs. Females mature sexually at 3 to 4 years and males between 2 and 7 years. Although their life span is unknown, an animal at least 12 years old has been recorded. Ross seals eat mostly cephalopods, and feed under the great thickness of the heavy pack ice where there is little light.

There is no reason to think this species has experienced a decline in numbers. Antarctic sealing activities did not involve species found in the pack ice to any great extent. More information on its biology and ecology is needed before its role in the ecosystem can be asessed. The population estimate of 220,000 animals is probably low.

Leopard Seal

Hydrurga leptonyx

The leopard seal, a major predator of penguins and seals throughout the drift ice areas of the Antarctic, is a straggler on the shores of all southern continents and hauls out on many of the sub-Antarctic islands. It has a long streamlined body, a large head with a wide gaping mouth, and long tapered fore-flippers. Most sightings have been of single animals.

Although adult males reach an average length of about 9 ft, some are known to reach 10.5 ft. They usually weigh about 700 lbs, but some weigh up to 1,000 lbs. Females are about 9.4 ft long and weigh about 800 lbs, but weights up to 1,300 lbs have been recorded. Pups are born in November and December and weigh about 77 lbs and are about 5 ft long. Females reach sexual maturity at 3 to 7 years and males betweeen 2 to 6 years of age. Longevity is estimated at more than 26 years. Leopard seals feed on krill, an abundant food source that may be especially important to the young animals. Killer whales prey on leopard seals, and leopard seals are known to prey on crabeater seals. They have been displayed in public facilities.

The leopard seal is not hunted in any country and is under the regulatory regimes of international treaties. The total population is estimated at about 500,000 animals.

Weddell Seal

Leptonychotes weddelli

The Weddell seal is an animal of the Antarctic fast ice attached to shores of islands and the continent. Breeding colonies are known on the island of South Georgia and strays have been seen as far north as Uruguay. It is not considered a migratory species, but its seasonal abundance is influenced by the development of fast ice and tidal cracks in the ice which give it access to the surface. The pupping season is from September through November. Females come up on the ice through cracks that are kept open through repeated use. Groups of females haul out around these holes and cracks and frequently return to the water to feed. Males spend much of their time below the ice establishing territories and competing with other males.

Adults are from 7 to 11 ft long and weigh between 700 to 1,200 lbs. Pups are born with a gray and dark lanugo coat and molt about the time they are weaned at six weeks of age. They grow rapidly from a birth weight of about 50 lbs to 275 lbs when weaned. Mating takes place in the water near the breathing holes. Gestation is about 11 months including a delayed implantation of 2 months. Both sexes mature between 3 to 6 years of age although males probably do not mature socially until 7 or 8 years. Leopard seals prey on this species as do killer whales to a lesser extent. Weddell seals eat a wide variety of invertebrates including krill and fish. Weddell seals are the longest and deepest diving pinnipeds. A dive of 1,900 feet for 70 minutes has been recorded, although they probably feed between 990 to 1,320 ft. These seals are known to live at least 25 years.

Since it is difficult to observe the animals in their preferred habitat, the shore-fast ice, a population estimate of 750,000 animals is considered conservative. The world population is considered stable.

Northern Elephant Seal

Mirounga angustirostris

The Northern elephant seal, the second largest species of pinnipeds, is found on offshore islands from Central Baja California to Pt. Reyes, north of San Francisco. Because the male defends territories on the beach and battles with other males to defend this territory, the elephant seal differs from other phocids in its social organization. While the females are able to move away from combatant males, the less mobile pups are occasionally crushed by the males. Although they do not have defined migration patterns, weaned pups scatter northward over a wide area. Elephant seals can be found on rookeries at all times of the year although some wander as far north as southeastern Alaska and have been recorded over 125 miles off shore.

Pups are born from December through February after a gestation period of 11.3 months including a delayed implantation of about 3 months. They weigh between 69 to 79 lbs at birth and after 4 weeks of nursing, their weight reaches about 345 lbs. Adult males are 14 ft long and weigh between 3,960 and 5,940 lbs; the females are 12 ft long and weigh around 1,980 lbs. Females mature sexually between 3 and 5 years while the males mature between 4 and 5 years and become territorial breeding bulls at age 9 or 10. Northern elephant seals have relatively short lives, usually about 14 years. They are deep divers feeding on fish below 50 fathoms as well as fish in shallow depths.

This species has made a remarkable recovery in its population numbers. In 1892, it was estimated that only 100 elephant seals remained, and they inhabited Guadalupe Island, Mexico. The total population now is about 100,000 animals.

Researcher checks tags on northern elephant seal at San Miguel Island, Calif. Photo by Dana J. Seagars, Southwest Region, NMFS.

Order Cetacea

Whales, Dolphins, and Porpoises

Cetaceans as an order of mammals, including whales, dolphins and porpoises, are about 65 million years old. In the last twenty years, the fossil record for this group has become much better understood. One extinct group, the suborder Archeoceti (oldest whales) which preceded the two living suborders, baleen whales and toothed whales, displays many characters of the land dwelling origins of the cetacea yet they developed special qualities for life at sea. These early whales had teeth in both the upper and lower jaws, small hind limb bones not connected to the spinal column, and nostrils placed forward or on the middle of their long snout. Their teeth were triangular shaped, and a specialization of the inner ear suggests that hearing underwater sounds was an early adaptation of living completely at sea. One of these early whales possesses the ear structure of baleen whales and small teeth in both the upper and lower jaws. The two living suborders were established about 50 million years ago and by that time had completely developed the special characteristics of the order. The tail was horizontal (instead of vertical as in fish and extinct marine reptiles); it had no bony support but was comprised of a new structure, blubber. The nostrils (blowholes) had migrated back to the front of the brain case which allowed breathing from the top of the head while the bones of the snout had lengthened. Another new structure not found in other mammals was a dorsal fin consisting of only blubber and blood vessels.

Since whales are air breathers, they have had to adapt to a life at sea. Like other mammals, they bear their young alive. Also, whales regulate their body temperature above their surroundings. Cetaceans are insulated by blubber, a fatty layer beneath the skin; it differs from the blubber of seals since it retains its structure even when the animal has not been feeding. Because whales produce some of the richest milk of all the mammals, there is a phenomenal growth rate in calves. Also cetaceans have the advantage of buoyancy which contributes to a faster growth rate than most land dwelling animals. A fatty oil is present throughout most of their body systems except for the brain and central nervous system. In all living cetaceans, the brain is large compared to the body weight, and the areas associated with hearing are dominant. All species possess a multi-chambered stomach that digests food usually swallowed whole. The kidneys of whales are comprised of dozens to several hundred

smaller units, each with the structure of a single kidney. Whales have a moderately long gestation period and nurse their young for a year or longer. They can experience multiple pregnancies similar to other large mammals although twins or triplets probably do not survive after birth. All of the living cetaceans have a reduced hind limb structure which is set in the muscles near the anus. In some abnormal cases, these bones may protrude through the blubber. By severing all ties to land, cetaceans have made the most changes in the evolution of marine mammals.

POPULATION ESTIMATES: CETACEA

Name Order: Cetacea Suborder: Mysticeti Family: Eschrichtiidae	Estimated World Total	Comparison of Population Data[1]	Arctic Circumpolar	PACIFIC				ATLANTIC				SOUTHERN OCEAN			
				Asia	Alaska	North America	South America	North America	Europe	Africa	South America	New Zealand	Australia	Sub Antarctic	Antarctic
Gray whale (Eschrichtius robustus)	17,000	best			17,000										
Family: Balaenopteridae															
Minke whale (Balaenoptera acutorostrata)	385,000/ 425,000	incomplete		+[2]	+	+		+	80,000/ 120,000					305,000	
Sei whale (Balaenoptera borealis)	42,000	incomplete		30,000	+	+	+	2,000	+	+	+		10,000		
Bryde's whale (Balaenoptera edeni)	35,000 40,000	incomplete		20,000		+	15,000/ 20,000	+		+	+	+	+		
Fin whale (Balaenoptera physalus)	117,600/ 120,300	best			17,000			3,600/ 6,300	12,000				85,000		
Blue whale (Balaenoptera musculus)	11,700	complete			1,600			100	+	+	+		10,000		
Humpback whale (Megaptera novaeangliae)	10,275	incomplete			1,000			5,775	1,000		+		2,500		
Family: Balaenidae															
Right whale (Balaena glacialis)	3,500 3,700	best			200			300/ 500		+	+		3,000		
Bowhead whale (Balaena mysticetus)	4,000	complete	+		3,871										

[1]Best = the most comprehensive estimates throughout the range of the species.
Complete = good population estimates throughout the range of the species.
Incomplete = population estimates only in parts of the range of the species.
[2]Although a population occurs in this area, the numbers are either unknown or the data are not available.

POPULATION ESTIMATES: CETACEA Continued

Name Order: Cetacea Suborder: Odontocati Family: Delphinidae	Estimated World Total	Comparison of Population Data	Arctic Circum-polar	PACIFIC				ATLANTIC				SOUTHERN OCEAN			
				Asia	Alaska	North America	South America	North America	Europe	Africa	South America	New Zealand	Aus-tralia	Sub Ant-arctic	Ant-arctic
Atlantic white-sided dolphin (Lagenorhynchus acutus)	no data	incomplete						24,000	+						
Pacific white-sided dolphin (Lagenorhynchus obliquidens)	no data	incomplete		+		30,000/ 50,000									
Northern right whale dolphin (Lissodelphis borealis)	no data	incomplete		+	+	+									
Southern right whale dolphin (Lissodelphis peronii)	no data	incomplete										+	+	+	
Risso's dolphin (Grampus griseus)	no data	incomplete		+	+	+	+	10,000	+	+	+				
Melon-headed whale (Peponocephala electra)	no data	incomplete				+	+								
Pygmy killer whale (Feresa attenuata)	no data	incomplete				+	+	+	+	+	+	+			
False killer whale (Pseudorca crassidens)	no data	incomplete		+		+	+	+	+	+	+	+	+		
Long-finned pilot whale (Globicephela melaena)	no data	incomplete						+	+						
Short-finned pilot whale (Globicephala macrorhynchus)	no data	incomplete				+	+	+	+	+	+				
Killer whale (Orcinus orca)	no data	incomplete	+	+	+	+	+	+	+	+	+	+	+	+	+
Rough-toothed dolphin (Steno bredanensis)	no data	incomplete				+	+	+		+	+				
Bottlenose dolphin (Turslops truncatus)	no data	incomplete		+		+	+	14,000/ 23,000	+	+	+				
Spinner dolphin (Stenella longirostris)	no data	incomplete		+		900,000		+		+	+				
Spotted dolphin (Stenella attenuata)	no data	incomplete		+		2.2 Mil									

POPULATION ESTIMATES: CETACEA Continued

Name Order: Cetacea Suborder: Odontoceti Family: Delphinidae Continued	Estimated World Total	Comparison of Population Data	Arctic Circum-polar	PACIFIC				ATLANTIC				SOUTHERN OCEAN			
				Asia	Alaska	North America	South America	North America	Europe	Africa	South America	New Zealand	Aus-tralia	Sub Ant-arctic	Ant-arctic
Atlantic spotted dolphin (Stenella plagiodon)	no data	Incomplete						+	+	+	+				
Striped dolphin (Stenella coeruleoalba)	no data	Incomplete		+		2.3 Mil		+							
Common dolphin (Delphinus delphis)	no data	Incomplete		+		900,000		31,000	+	+	+	+	+	+	
Fraser's dolphin (Lagenorhynchus hosei)	no data	Incomplete				+				+	+				
Family: Phocoenidae															
Harbor porpoise (Phocoena phocoena)	no data	Incomplete		+	+	+		18,000	+						
Dall's porpoise (Phocoenoides dalli)	920,000	complete			920,000										
Family: Monodontidae															
Beluga, belukha, white whale (Delphinapterus leucas)	62,000/ 88,000	complete	62,000/ 88,000	+	+	+		+	+						
Narwhal (Monodon monoceros)	30,000	Incomplete	30,000	+	+	+		+	+						
Family: Physeteridae															
Sperm whale (Physeter catodon)	904,000	complete			472,000			22,000		+	+			410,000	
Pygmy sperm whale (Kogia breviceps)	no data	Incomplete		+		+	+	+		+	+				
Dwarf sperm whale (Kogia simus)	no data	Incomplete		+		+	+	+		+	+				
Family: Ziphiidae															
Baird's beaked whale (Berardius bairdii)	no data	Incomplete		+	+	+						+	+	+	

This humpback whale, nicknamed "Cats Paw" by researchers, has an unusual feeding style. After surfacing vertically with a closed mouth, she opens her mouth as she backs into the water and resurfaces to feed in a typical lunge through schools of sand lance. Although she uses this technique frequently, it is not well understood.

Photos by Mason Weinrich, Cetacean Research Unit,
Gloucester Fisherman's Museum, Gloucester, Mass.

Suborder Mysticeti

Baleen Whales

There are three living families of baleen whales; the rorquals (6 species), the right whales (3 species), and the gray whale. Instead of teeth in the upper jaws, they have two rows of baleen plates (whale bone) which hang down from the roof of the mouth. Each plate is fringed with hair-like bristles wrapped in material similar to fingernails (keratin). After the whale scoops up water, the tongue scrapes the inner surface of the plates and the bristles which are mated together filter the whale's food, and the water is strained out of the mouth. Each speices of baleen has a different texture of bristles. Sei whale baleen bristles are thin and soft, forming a filter like silky hair. The right whale baleen plates are over 6 feet long and contain sparse coarse fibers.

One of the baleens, the blue whale, is the largest animal known living or extinct. The accepted record length is 102 feet for an animal taken south of New Zealand. In contrast, the pigmy right whale in the Southern hemisphere grows only 16 to 18 feet long as an adult. Baleen whales do not travel in large herds. All of the species probably migrate according to seasons. The best known example is the gray whale's 11,000 mile annual trek south and return to the Bering Sea. Except for the bowhead whale, the various species breed and give birth in warmer temperate and tropical waters and move to the nutrient rich waters of the higher latitudes to feed and nurse their young.

Family Eschrichtiidae

Gray whale

Although many skeletal remnants of the Atlantic form are known from European waters, notably the Baltic and eastern North American waters, the only living species in this family is found in the eastern Pacific Ocean and Bering and Chukchi Seas. The Atlantic form is being studied to determine if the term "scag whale" in the accounts of early European whalers referred to an Atlantic gray or if it was a reference to small or sickly animals. A western population winters off Japan and in the Yellow Sea and is considered severely depleted; a few reports indicate this species still can be found there.

Most of the many specimens of fossil gray whales that are being studied are from California, but some are from other areas around the Pacific basin. Both their lack of speed and a streamlined body distinguish them from the other two families of baleen whales. The upper jaws with two rows of baleen plates have a low arch, and a profile of the head reveals that the lower jaws and lips are not especially dominant features. In place of a dorsal fin, there are 9 to 14 bumps or knuckles along the midline of the tail. They have 2 or 3 variable throat creases or grooves which are unlike those in rorquals. Although the general form of the gray whale is intermediate between the two other families, the fossil record does not support the idea that it preceded the other groups.

Gray Whale

Eschrichtius robustus

The gray whale is one of the better known cetaceans and has been studied extensively over the last twenty years. Every fall, this species migrates up to 11,000 miles from the Bering and Chukchi Seas to lagoons in Baja California. They move through Unimak Pass in the Aleutian Island chain, travel close to shore along the west coast to California and arrive in the calving and breeding lagoons in January. Many of the younger migrants seen throughout the summer have traveled only halfway to the northern feeding grounds of the adults.

Male gray whales average less than 40 ft in body length and reach sexual maturity at 5 to 11 years. Females probably bear a calf every other year or more. Gestation is 12 to 13 months and nursing lasts about 7 to 8 months. The newborn are about 16 ft long. The gray whale feeds on the bottom of the ocean and rakes through the mud with its stiff rows of baleen. They eat a wide variety of invertebrates, usually amphipods (small crustaceans such as sand hoppers). These whales are covered with large numbers of shelled barnacles and are host to great colonies of whale lice which show up as patches of yellow against the whales mottled gray pattern.

The eastern Pacific population is estimated at 17,000 animals.

Family Balaenopteridae

Rorquals

The rorquals are the fastest swimmers of the baleen whales. They feed heavily on plankton and several types of school fish in the northern hemisphere and almost exclusively on plankton (krill) in the southern hemisphere. With the exception of the Bryde's whale, the migration of northern and southern populations alternate between high cold latitudes and tropical temperate waters in each hemisphere. In July, August and September, the southern rorquals are in the tropical wintering grounds of southern hemipshere waters and are not in contact with their northern hemisphere counterparts which are feeding in the higher latitude temperate or arctic waters. There are records of rorquals tagged in the southern hemisphere being recovered in the tropical North Pacific but mixing of the populations of each hemisphere is not thought to be significant. This family contains two living genera, Balaenoptera with 5 species and Megaptera with 1 species. Adults range in size from 30 ft (minke) to over 100 ft (blue).

These whales have grooves or pleats in their throat that extend from the chin to various levels from the chest to the navel. Throat grooves contain both blubber and a thin sheet of muscles. Sailors and cetologists often have speculated on the function of the grooves. Both aerial and underwater films of feeding blue, fin, and humpback whales reveal that the extended grooves increase the size of the head and chest 2 to 3 times larger than the rest of the body. The volume of food and water filtered through the baleen rows is equal to or greater than the tremendous amounts found in the huge mouths of right and bowhead whales. When feeding, these otherwise sleek whales resemble guppies.

Minke Whale

Balaenoptera acutorostrata

The minke whale, the smallest member of this family, is found in all of the world's oceans. It migrates between temperate tropical waters and high latitudes. In the Antarctic, it feeds among the fields of drift pack ice and sometimes becomes trapped in the ice where it must maintain an open area for breathing. In the North Atlantic, it feeds on fish, notably capelin; in the Southern Ocean, it feeds almost exclusively on krill. This wide ranging species has many variations in color pattern and hue. Adults range from 22 to 33 ft in length. The calf is 2 to 9 ft long at birth and is weaned at about 6 months. Sexual maturity occurs at about 6 to 7 years of age for whales in the southern hemisphere and at 7 to 8 years in the northern hemisphere. Females usually give birth every year.

This species is the only baleen whale taken commercially in the southern hemisphere where its population is estimated at greater than 300,000. The North Atlantic population is about 80,000-120,000 animals. An estimate for the North Pacific has not been developed.

Sei Whale

Balaenoptera borealis

The sei whale is named after the Norwegian word for pollock, a species of fish. Sei whales migrate from tropical to high latitudes in both hemispheres. They are smaller than the fin whales, but have the largest dorsal fin in proportion to the other species in this genus. Their fine almost silken baleen allows them to feed on some of the smallest food items, copepods (minute crustaceans), of any whales. In the northern hemisphere, they also feed on school fish such as herring, sardines, anchovy, and sauries.

Sei whales travel in groups of 2 to 5, and many of these groups will gather in a small area. Sei whales mature sexually when they are between 6 and 12 years old. Males grow to lengths of about 53 ft and females about 55 ft. Gestation is 11 to 12 months. The newborn calf is about 15 ft long. Nursing lasts 6 to 7 months or until the weaned calf is about 28 ft long. Sei whales taken off the California coast have been infected with a disease that disintegrates the baleen plates which are replaced by a hairy-like growth. Without the baleen plates, the whales are unable to feed.

In the North Pacific and Southern Oceans, sei whales are listed as a protected stock by the IWC. In the North Atlantic, a quota and regulations are set for this species for Icelandic whaling. In other areas of the world, this species is considered to be below its maximum sustainable yield, but not depleted. The total world population may be about 42,000 animals.

It is estimated that the Nova Scotia Management stock of sei whales ranges from 1,398 to 2,248. The Cetacean and Turtle Assessment Program (CETAP) reports that seasonal populations in the U.S. western North Atlantic from Cape Hatteras north to the Gulf of Maine peak at 280 animals in the spring.

Bryde's Whale

Balaenoptera edeni

Bryde's whales are found in warm temperate waters in all the oceans. They are often confused with sei whales since they are similar in size and form. This species has a smaller dorsal fin, three ridges on the top of the snout and a change in the color of the baleen plates from the front to the back of the mouth. It is the only rorqual that does not migrate to high latitudes to feed and to nurse its young. It has coarse baleen bristles and feeds on fish and a variety of plankton . Bryde's whales are between 43 and 45 ft long as adults; they become sexually mature when they reach about 40 to 41 ft in length. In South African waters, they breed all year; in the northern hemispheres, breeding probably occurs from November through February. Gestation is about 1 year. They have been reported traveling in pairs and groups of up to ten.

Although population estimates are being developed, the process has been complicated by the use of data gathered when both scientists and whalers confused this species with the sei whale. The North Pacific population is estimated at about 20,000 whales, and the population off Peru is estimated to be 15,000-20,000; estimates for other areas have not been developed.

Fin Whale

Balaenoptera physalus

The fin whale is the second largest species of rorqual with a recorded length of 82 ft although it's usually about 60 to 75 ft long. The female is slightly larger than the male. It moves in groups of 2 to 5 animals, but aggregations of 50 to 100 have been seen within a few square miles. Although found in all oceans, its high latitude migrations are not as extensive as other species. They have a striking asymmetrical color pattern on the head that is consistently white on the right side of the head as well as the belly which may be an advantage when the whale attacks a school of fish. The standard marine mammal color pattern is darker on the back and lighter on the belly. This species matures sexually between 6 and 12 years of age. Gestation lasts about 12 months, and the calf averages about 21 ft long at birth. Nursing lasts for 6 to 7 months or until the young are about 40 ft long. Females bear a calf every 2 to 3 years. Along the edge of the U.S. continental shelf, it feeds on the extensive populations of small schooling fish.

Although fin whales are not as seriously depleted as some other large whales that are taken commercially, they are depleted in some portions of their range. The total population estimate is about 114,000. CETAP reports that seasonal populations in the U.S. western North Atlantic from Cape Hatteras to the Gulf of Maine reach a peak of 5,400 animals in the spring. This species is subject to Icelandic commercial whaling operations in the North Atlantic.

Blue Whale

Balaenoptera musculus

Blue whales are known for their overall size and length. The accepted record is nearly 102 ft long for an animal found south of New Zealand. Blue whales are also known as "sulphur bottom" due to a definite yellow cast sometimes present on the belly and sides of animals seen in the Antarctic. This coloring is caused by a film of diatoms, a form of phytoplankton which adheres to the skin of several whale species as they swim in the Antarctic Convergence current. In these waters, the animals can change from pale to a distinct yellow color in less than a month. Diatoms are the food of the various species of krill which is the major food resource of baleen whales. Blue whales feed almost entirely on krill in both hemispheres.

Blue whales have a small dorsal fin, a broad head, and a more massive back than other species of the genus. Gestation is 12 months, and the calves are about 24 ft long at birth. During 8 months of nursing, the calf gains about 200 lbs a day. They are about 50 ft long when weaned. A form of this species, the pygmy blue whale, inhabits the Indian Ocean.

Blue whales are a depleted species and have been protected by the IWC since 1966. Population numbers are reported to be increasing slowly; the current world-wide estimate is about 11,700 animals.

Humpback Whale

Megaptera novaeangliae

The humpback whale is heavier bodied than other members of its family, and its flippers are one-third as long as the length of its body. There are a variable number of bumps of blubber on the head with each supporting a single hair follicle. The flippers have a series of knuckles on their leading edge which are associated with the bony joints of the encased fingers. Individual humpbacks can be identified by the unique color pattern on the underside of their flukes and by their small, irregularly shaped dorsal fins.

Humpback whales migrate to high latitudes where they approach but do not enter the polar pack ice zones. While wintering in tropical latitudes, they usually calve and breed in the shallow waters of islands and atolls. The breeding and calving season is October to March in the northern hemispheres and April to September in the southern hemipshere. Gestation lasts 12 to 13 months. Calves are about 12 to 14 ft long at birth. Nursing continues for about 11 months. The female rarely bears a calf two years in a row. Females are larger than males and reach sexual maturity when they are about 40 ft long. Males mature sexually when they are about 35 ft long. Humpbacks feed heavily on schooling fish such as sand lance, anchovies, and sardines and on krill in high latitudes. Sometimes they create a net or a cloud of bubbles around a school of prey and then rise through the column of water engulfing the prey.

Humpback whales are seriously depleted; their estimated world-wide population is 10,275 animals. The populations which have been studied are slow to recover. Because they frequent shallow coastal waters while both feeding and calving, they often cross shipping lanes and come into contact with vessel traffic including fishing boats.

Family Balaenidae

Right whales

Right whales are distinguished from other baleen whales by a high vaulted arch to the upper jaws and massive thick lower jaws that have tall thick lips covering their baleen plates. This family contains two genera and three species. The bodies of the right and bowhead whales are thick and heavy; their tails are tapered; and their flukes are wide and expansive. The skull is wide and massive, but when viewed from above, the elongated bones of the snout foward of the blow hole are like a narrow projection set between the huge lower lips. The seven vertebrae of the neck are fused together. Their distinctive double blow rises above the animal before forming a cloud.

The smallest species, the pygmy right whale, has the basic characteristics of the family but has a dorsal fin and is not as heavy bodied as the others. What little is known about this species is based on observations of one animal trapped alive in a South African bay and fragmentary information from fewer than a hundred specimens.

These slow moving animals probably are not deep divers and are often found in the shallow waters of bays and shore lines. They were subject to a ruinous exploitation by early whalers. The 16th century Basques of Europe were probably the first to organize far away whaling expeditions that returned with finished products of oil and baleen instead of returning with towed whales found closer to home. Their target species, the right whale, was hunted from sailing vessels. The whaling industry carried whalers to the high latitude waters of the arctic Atlantic where they met the bowhead, and whaling expeditions became an integral part of the European exploration of North America.

Right Whale

Balaena glacialis

Today, right whales are found in small numbers in the North Pacific, the Western North Atlantic, and the Southern Ocean. Right whales are round heavy bodied animals without a dorsal fin. They reach 60 ft in length and have growths (callosities) on the skin, over the eyes, the snout, and the sides of their arched lower lips. These growths, made of a hard tissue (keratin), allow ectoparasites such as barnacles and whale lice to adhere to the skin. It is possible to identify individual whales from the distribution and form of these growths. Right whales feed extensively on copepods, and, along the edge of the U.S. continental shelf, they feed on the large concentrations of small schooling fish. Males mature sexually when they reach about 50 ft in length; females mature when about 51 ft long. Breeding and calving take place in tropical waters. Gestation lasts about 12 to 13 months.

Right whales, the most severely depleted of the great whales, have been protected from commercial whaling since 1938. The Southern Hemisphere population is estimated at 3,000 animals. The two northern hemisphere groups are threatened with extinction. The north Pacific population is estimated at 100 to 200 animals; the north Atlantic at less than 500 animals. CETAP reports a seasonal population of 380 in the spring in the Gulf of Maine and Georges Banks.

Bowhead Whale

Balaena mysticetus

The bowhead whale is circumpolar in arctic and subarctic waters. They have between 250 and 300 baleen plates on each side of their jaw that are about 10 to 11 ft long. They do not have a dorsal fin. Bowhead whales migrate according to the seasonal movement of the arctic pack ice. During their northward migration, they follow the narrow leads developed in the shore-fast ice. Bowhead whales can break ice several inches thick as well as travel under large ice floes. Adults reach a length of about 60 ft. Females become sexually mature when they are about 40 ft long. Conception is thought to occur in March with calves born from April to June or July during the spring migration. Gestation appears to be about 13 months. The newborn calf is 10 to 15 ft long at birth and the nursing period may last up to one year. This species usually travels alone or in small groups but has been observed in groups up to 50. They feed largely on euphausiids and copepods, but include several other groups of invertebrates in their diet.

This species is severely depleted worldwide. The Bering, Beaufort, and Chukchi Seas population is estimated at just under 4,000 individuals, There is a subsistence take of this species by Alaskan Eskimos. Quotas for this subsistence take are set by the IWC.

Suborder Odontoceti

Toothed Whales

There ae 65 species of whales, dolphins, and porpoises in this suborder. Most have teeth and most have developed a melon located in front of the brain. The melon, a barrel-shaped organ called the "case" by whalers, contains spermaceti, a clear liquid oil that hardens to a white paraffin-like consistency.

The animal shunts air through a series of passages (sinuses) connected to the blowhole and produces high pitched sounds which are transmitted through oily tissue of the melon and broadcast in front of the swimming animal. Pads of this oily tissue are found on the inside of the lower jaws which are in a straight line with the head and connect to the bottom of the brain case at the inner ear. The theory is that the melon acts as a focusing lens for the sounds produced behind it; the sound travels ahead of the animal, returns as an echo, is received in the lower jaw, and then transmitted to the inner ear. These structures make it possible for toothed whales to echolocate, which is a method used to locate objects by determining the time for an echo to return and its direction.

The toothed whale's brain has one of the largest size to body weight ratios found in any group of mammals. Based on studies of anatomy and physiology of the brain of odontocetes, the areas associated with hearing are more developed than in mammals that do not echolocate.

In addition to their ability to echolocate, toothed whales have the best developed diving abilities of all whales. At least four species are known to dive for an hour at a time, and at least four others regularly dive for 30 minutes or more. In contrast, the baleen whales average 5 to 20 minute dives. They are also deep divers; sperm whales have been found wrapped in submarine cables at depths greater than 3,600 feet. The stomach contents of giant bottlenose whales taken in waters 4,000 feet deep contained organisms found only on the bottom. A coastal bottlenose dolphin trained to take its own picture at various depths easily accomplished a record of 1,000 feet although dives usually are to only 300 feet or less. Studies of the diving accomplishments of toothed whales have led to the discovery of several adaptations of their anatomy and physiology. Unlike human deep sea divers who breathe different pressures of air at different depths, whales breathe only one atmosphere of air pressure (at sea level).

Family Delphinidae

Dolphins

This family includes both small and medium sized dolphins as well as larger pilot and killer whales. The delphinids move in herds of 15 to 20 to several thousand. In recent years, extensive observations at sea have provided new insights into their social groupings and behavior. Some coastal dwelling species feed alone, but generally they move back to a group within a short time. Large herds may contain several species. All species of cetaceans have internal parasites (endoparasites), and recent studies of delphinids have provided new information on the life cycles of these organisms. The delphinids have many species of internal parasites such as flukes, roundworms, and tapeworms which are found in the brain, lungs, kidneys, and digestive system, but apparently do not always cause disease problems. Parasites, a variable factor in the life history of a species, may contribute to natural mortality of these animals.

Based on the studies of the teeth of several species, we have new information on dolphin biology. Special techniques developed to section and stain the teeth allow detailed analysis of the growth history of the animal. Calcium layers are deposited at regular time intervals in the teeth so that the age of the animal can be determined; they also provide information on estimating the month of birth, the length of the nursing period, and sexual maturity. By combining tooth layer studies with other biological information, detailed knowledge of the life history of several species of dolphins is becoming known.

Rough-Toothed Dolphin

Steno bredanensis

The rough-toothed dolphin is found in tropical and warm temperate waters of the Atlantic, Indian, and Pacific Oceans. Its appearance is similar to the bottlenose dolphin; however, the head is cone shaped due to the smooth slope of its melon. It reaches a length of about 7 ft, and travels in schools of up to 50 animals. Sometimes it travels with bottlenose, spinner, and spotted dolphins. It feeds on fish and squid, and its relatively large teeth have a series of vertical wrinkles, hence "rough toothed" dolphins. It is involved in mass strandings usually in groups of 10 or less. Although rough-toothed dolphins are oceanic, they are often found inshore. Some specimens have been maintained in captivity for over 12 years.

Population estimates are not considered reliable for the large distribution of this species. It is minimally involved in the yellowfin tuna purse-seine fishery in the eastern tropical Pacific Ocean.

Bottlenose Dolphin

Tursiops truncatus

The bottlenose dolphin, one of the best known species of cetaceans, was the first species to be successfully maintained and bred in captivity. It is distributed worldwide including the western north Atlantic from Venezuela to Nova Scotia and the eastern north Pacific from the tropics through at least the Hawaiian archipelago. In the southeastern U.S. Atlantic and Gulf of Mexico coastal waters, this species is thought to be pricipally distributed in nearshore and estuarine environments although recent information suggests that a sizeable population exists offshore. Bottlenose dolphins are distributed inshore from Cape Hatteras to the Delmarva Peninsula while the offshore distribution is continuous from Cape Hatteras along the edge of the U.S. continental shelf to the northeast part of Georges Bank. Along the California coast, bottlenose dolphins are continuously distributed inshore as far north as southern Los Angeles County and offshore to at least Point Conception. They are also found in U.S. Caribbean waters around the U.S. Virgin Islands and Puerto Rico.

Some degree of reproductive isolation exists between stocks found in nearshore and coastal waters and those offshore. The offshore form is larger, darker, and has different parasites than the inshore form. Other morphological differences, including cranial skeletal variations, may also exist. Recruitment into the sexually mature population may occur between 5 and 13 years of age in females and between 7 and 15 years in males. Spring mating results in a calf one year later; a calving interval of two years has been observed in free-ranging animals in Florida. Females presumably reproduce through 25 years of age. They feed on a wide variety of fish and probably concentrate on species that are seasonally abundant.

At present, there is no comprehensive estimate of size of the stock(s) of bottlenose dolphins in U.S. jurisdictional waters. Their abundance in certain regions of the Atlantic, Pacific and Gulf coasts has been estimated. A conservative estimate of bottlenose dolphins in U.S. waters of the Atlantic and Gulf of Mexico is 14,000 to 23,000 individuals. The stock(s) of bottlenose dolphins in southeastern U.S. waters have supported several fisheries since at least the 1700's. Among these are the now defunct seine-net fisheries at Cape Hatteras and Cape Lookout and a small harpoon fishery in Tampa Bay. The estimated catch from Cape Hatteras and Cape Lookout between 1883 and 1914 was 20,892 animals; this fishery remained active until 1929.

Spinner Dolphin

Stenella longirostris

Spinner dolphins, named for their habit of literally spinning several (2 to 5) times on the long axis of their body, are found in the tropical waters of all the world's oceans. The significance of the spinning behavior is not understood. In the eastern tropical Pacific, these dolphins occur in herds of several hundred animals. Adults average 5.6 ft in length; they have a prominent triangular dorsal fin, and, generally, a long beak. The young are about 2.5 ft long when they are born after a gestation period of 10.6 months. They feed on mid-water lantern fish and other fish species; their diet also includes squid. They may feed at different times than the yellowfin tuna and other species of porpoises with which they travel. Spinner dolphins often ride the bow waves of boats for long periods of time. They have been maintained in captivity in warm water aquariums for 7 to 10 years.

Spinner dolphin populations have been studied extensively in the eastern tropical Pacific (ETP) where they are taken in the yellowfin tuna purse seine fishery. The population is estimated at about 900,000 in the ETP and is considered abundant elsewhere in its widespread range.

Atlantic Spotted Dolphin

Stenella plagiodon

This species, found along the continental shelf, moves inshore in the spring. It feeds primarily on squid and barnacles. Whale lice are found on its skin. The body is more robust than other species in the genus *Stenella*, and the dorsal fin is similar to that of bottlenose dolphins. Adults reach a length of about 8 ft. They travel in groups of 20 to 50 animals, but herds of several hundred animals have been observed. They often ride the bow waves of vessels and breach clear of the water. Atlantic spotters have been maintained in captivity. There is insufficient information to estimate population levels for this species.

Spotted Dolphin

Stenella attenuata

The spotted dolphin occurs in all tropical waters of the world. In the last 10 years, much information has become available about this species although the relationship of the several forms is not understood at this time. The Pacific form is found with other species, especially the spinner dolphin. Combined aggregations may include several thousand animals. Gestation is about 11.5 months and the length of a newborn is 2 1/2 ft. The nursing period is about 11 months. Spotted dolphins feed on a variety of midwater and surface fish and squids.

Population increases have been recorded for some of the identified stocks of the species in the ETP where it is taken incidentally in the yellowfin tuna purse-seine fishery. The population in the ETP is estimated at 2.2 million animals.

Common Dolphin

Delphinus delphus

The common dolphin is an oceanic species infrequently found in the shallow waters of the continental shelf. Common dolphins are found worldwide in tropical and temperate waters. Their practice of riding the bow waves made by ships may be a carry over from riding the bow waves of large baleen whales. Common dolphins average about 6.5 ft long with the males slightly larger than females. The sexes may segregate between mating seasons. Gestation last 10 to 11 months; newborns are about 2 1/2 ft long; the young are weaned at 1 to 3 years of age. Although they travel in groups of 40 to several thousand, they may break into several smaller groups during the breeding season. Common dolphins are not considered deep divers although they average 30 fathoms while feeding on anchovies, squid, lantern fish, and other species.

This species is involved in the yellowfin tuna purse-seine fishery in the eastern tropical Pacific where its population is estimated at 900,000 animals. In the U.S. western North Atlantic from Cape Hatteras north to the Gulf of Maine, CETAP reports seasonal populations of 31,125 in winter and 2,885 in summer.

Striped Dolphin

Stenella coeruleoalba

Striped dolphins are a widely distributed species found in the warmer waters of the Atlantic, Indian, and the Pacific Oceans. This species is slender in form and its average length is about 9 ft; newborn calves average 3 ft. The gestation period is about 12 months. They nurse their young for 18 months and mature sexually at about 9 years. Striped dolphins feed on mid-water fishes (usually lantern fish) as well as squid and crustaceans. This species travels in herds of 20 to 50 to several hundred animals. Striped dolphins are occasionally involved in strandings.

In the eastern tropical Pacific (ETP), where the striped dolphin is moderately involved in the yellowfin tuna purse-seine fishery, its population is estimated at 2.3 million animals. Population estimates for other parts of its range are not available. However, CETAP reports that seasonal populations in the Gulf of Maine peak in the spring at 4,320 animals.

Fraser's Dolphin

Lagenodelphis hosei

Fraser's dolphin is a recently discovered species previously known only from a skull collected in Borneo. In 1971, it was seen at sea in four widely scattered areas. It is about 6.5 ft long as an adult and about 3.3 ft long at birth. This species is thought to inhabit offshore tropical waters. It is seen in schools of 500 animals and has been seen traveling with spotted dolphins. The dorsal fin is small, the beak is short, and the body is heavy set. The general form is intermediate between the common dolphin (*Delphinus*) and the beaked dolphin (*Lagenorhynchus*). Fraser's dolphin is probably a deep diver since its stomach contents contain squid and deep water fishes. Knowledge is limited on this oceanic species.

Since this species was discovered only recently and because it does not occur in areas where cetacean population research is being conducted, reliable estimates of its numbers are not available. It is marginally involved in the yellowfin tuna purse-seine fishery in the ETP.

Atlantic White-sided Dolphin

Lagenorhynchus acutus

This dolphin occurs in oceanic waters and along the continental shelf. It is found in temperate waters of the North Atlantic including both inshore and offshore portions of the Gulf of Maine from May to November. In spring, summer, and fall, they can be found in the shallow fishing banks around Cape Cod and the northwest edge of Georges Bank.

As with other species in this genus, it has a complicated color pattern. Adults average about 10 ft in length; newborn calves are about 3.3 ft long. Gestation is 10 months, and age at sexual maturity is unknown. This species is involved in mass strandings. It frequently associates with pilot whales and humpback whales. It has not been maintained in captivity. This dolphin feeds on fish such as mackeral, herring, hake, sand lance, capelin, smelt, cod and sometimes squid.

The Cetacean and Turtle Assessment Program (CETAP) provided seasonal population estimates for the U.S. western north Atlantic from Cape Hatteras north to the Gulf of Maine as 36,281 in spring and 3,240 in winter.

Pacific White-sided Dolphin

Lagenorhynchus obliquidens

The Pacific white-sided dolphin is found in the North Pacific Ocean from Japan to California, but has not been recorded in the Bering Sea. It is generally an oceanic species but is sometimes found on the continental shelf and in large bays. The animals usually travel in groups of 15 to 50; however, schools of several thousand have been seen. They associate with northern right whale dolphins and Risso's dolphins. The Pacific white-sided dolphin is well known for riding the bow waves of ships and for leaping high into the air and landing sideways. Their heads and tails slap the water as they feed.

They grow to a length of about 7 ft and weigh about 400 lbs. Gestation is estimated at 10 to 12 months. The calves are about 4 ft long at birth which is large considering the adult's size. This species is active day and night, and feeds largely on squid, as well as herring, sardines, anchovies, and sauries. They are heavy bodied, have a short beak, and a tall curving dorsal fin.

They have been maintained in captivity. Population estimates in the eastern North Pacific range from 30,000 to 50,000. However, population studies are continuing since these figures are not considered reliable.

Northern Right Whale Dolphin

Lissodelphis borealis

There are two species in the genus *Lissodelphis*, the Southern right whale dolphin which is found in the temperate waters of the Southern Ocean and the Northern right whale dolphin which is found in the temperate waters of the North Pacific Ocean. These two species are the only delphinids that do not have a dorsal fin. Sighting records suggest that the northern species may be distributed continuously across the Pacific. They travel in groups of 15 to 200 or more in continuous u-shapes or long straight lines. They can swim faster than 25 knots and leap clear of the water and re-enter over 20 feet away. Entire herds have been seen diving for over 6 minutes at a time. Northern right whale dolphins average about 10 ft in length and have a long tapering tail. Calves are about 2 ft long at birth; neither the gestation period or nursing period are known. They feed largely on mid-water lantern fishes along the western United States coast. They often travel with Pacific whitesided dolphins as well as with Dall's porpoise.

There are no reliable population estimates for this dolphin.

Risso's Dolphin

Grampus griseus

Risso's dolphin is found in tropical and temperate waters of the world's oceans. They travel in groups of 5 to 15 although they have been seen in herds of several hundred.

This species is distinguished by scars covering the back and sides which may be caused by the tooth marks of other Risso's dolphins or large squid. They reach a length of about 13 ft. They usually are shy of small vessels, but have been seen riding the bow waves of ships. When traveling, their synchronized leaps in the water closely resemble bottlenose dolphins. After breaching and flopping on their sides for several minutes at a time, they like to loll at the surface and slowly mill about.

They have tall triangular dorsal fins and blunt heads. There are seven large teeth in each side of the lower jaw, but, in older animals, these may be worn or missing. Although they feed largely on squid, some species of fish have been found in their stomachs. Aquariums have maintained individuals species for several years.

Although there are no worldwide population estimates, in the northwestern Atlantic area from Cape Hatteras to the Gulf of Maine, CETAP reports that seasonal populations reach a peak of 11,680 animals in summer.

Melon-Headed Whale

Peponocephala electra

This tropical species is found in the Atlantic, Indian, and Pacific Oceans. In general, its form is similar to the pygmy killer whale. From the few animals examined, it is known to reach a length of about 9 ft. It has a long body, pointed jaws, and a large dorsal fin. A stranding of 250 melon-headed whales was recently investigated in Costa Rica. This species is minimally involved in the yellowfin tuna purse-seine fishery. The melon head whale is known from very few specimens, and there are no estimates available of its population size.

Pygmy Killer Whale

Feresa attenuata

The distribution of the pygmy killer whale is not well known, but it inhabits tropical and warm temperate waters. It has a prominent dorsal fin and a rounded head. Adults are about 8 to 9 ft long. They have 10 to 13 large teeth in each side of the upper and lower jaws. They travel in small groups of 5 to 10 animals although groups of several hundred have been seen. They prey on other species of dolphins, particularly the young. Although they are not well known in the stranding record, attempts to maintain this species in captivity have been with stranded animals. There is little reliable information on their food habits or reproductive biology.

This species is minimally involved in the yellowfin tuna purse-seine fishery. No estimates of its populations are available.

False Killer Whale

Pseudorca crassidens

False killer whales are found in tropical and temperate waters around the world; they are generally an oceanic form but large groups move close to shore when feeding. Several mass strandings of this species have been recorded. The largest mass stranding of cetaceans ever recorded involved over 800 false killer whales at La Plata, Argentina, in 1946.

Adult males are about 18 ft long and females about 13 ft; they weigh up to 3,600 lbs. Newborn calves are about 6 ft long. They have long bodies and narrow tapered heads. The shape of the dorsal fin is similar to that of bottlenose dolphins. Large teeth on each side of the jaw suggests that they feed on large animals.

This species is seen in herds of 50 to several hundred animals. Several mass strandings of this species have been recorded. Bottlenose dolphin herds often travel with this species. False killer whales ride the bow waves of ships and often jump clear of the water. They have been seen feeding on young dolphins, squid, and several species of medium to large-sized fish, including the dolphin fish (mahi-mahi). They have been maintained in captivity in Hawaii for several years.

There are no reliable population estimates for this species.

Long-finned Pilot Whale

Globicephala melaena

The long-finned pilot whale is generally an oceanic species, but has been observed on major banks and nearshore areas. It is found in the temperate regions of the North Atlantic and the southern hemisphere. Pilot whales are found in schools of hundreds or thousands. They feed mostly on squid, but also on fish. Male Atlantic pilot whales average about 21 ft in length, the females, 17 ft; the newborn 5 to 6.5 ft. The gestation period is about 16 months, and nursing may last 2 years. Breeding probably occurs year round. The melon is a prominent feature of the head. The flippers, usually one-fifth of the body length, are thin and tapered; and the dorsal fin has a broad base. This species is commonly involved in large mass strandings.

Dating back to the 1500's, there is a long history of directed fisheries for this species both in Europe and North America. As a result of these periodic exploitations, some local populations thought depleted have been restored. There are no reliable worldwide population estimates for this species. Their distribution in the U.S. Atlantic is centered on the continental shelf where other squid-eating cetaceans concentrate. Because the distribution of the long-finned and short-finned pilot whales overlap in a portion of the CETAP study area, the seasonal population estimates of 2,565 in winter to 11,420 in the spring include both populations.

Short-finned Pilot Whales

Globicephala macrorhynchus

The short-finned pilot whale is found in warm temperate and tropical waters of the Pacific, Indian, and Atlantic Oceans. It is similar to the other species of this genus but is more restricted to tropical waters. It travels in groups of 60 or more animals although smaller groups are more frequent. It feeds primarily on squid and a variety of fish. Adults are 15 to 21 ft long. The species frequently is involved in mass strandings.

There is some limited subsistence take of short-finned pilot whales in the Caribbean, and it is taken occasionally in large numbers in Japanese waters. The data base is not complete on this species, and worldwide population estimates cannot be made.

Killer Whale

Orcinus orca

Killer whales, worldwide in their distribution, are common in cool coastal waters. They hunt in the polar ice packs and are the largest species in the dolphin family. The dorsal fin is large in both sexes although it is much higher in males. The flippers are large in proportion to the remainder of the body and extremely mobile. These fast swimmers reach speeds of 25 knots or more.

Killer whales are highly predatory and feed on squid, sea turtles, fish, sea birds, whales, dolphins, and seals. They attack their prey as a group and organize a strategy to dislodge or to panic intended prey. In Argentina, they have been seen flopping several body lengths onto shore to panic the pinnipeds who escape to the water where other killer whales are waiting for them. Breeding probably occurs year round; gestation is about 13 to 16 months long. Calves are about 7 ft long at birth. Adult males are about 17 ft long and females about 24 ft long. This species is frequently maintained in oceanaria.

Preliminary estimates for killer whale populations in the Antarctic are being developed. World population estimates are not available although it is known that this species is abundant in certain areas of Puget Sound and Alaska.

Family Phocenidae

Porpoises

The three genera of the family Phocoenidae differ from dolphins internally and externally. A major internal difference is in the structure of the air sacs behind the melon and around the blowhole. Externally, porpoises are distinguished from dolphins by small spade-shaped teeth and a short blunt snout. Although these technical differences exist, the terms dolphin and porpoise are used interchangeably. The genus Phocoena has four species, the harbor porpoise of the North Pacific and North Atlantic coastal waters; the vaquita of the Gulf of California in Mexico; and the Burmeister's and spectacled dolphins of the temperate/tropical waters of the Atlantic and Pacific coasts of South America. The oceanic Dall's porpoise of the North Pacific Ocean and Bering Sea is the single species of the genus Phocoenoides. The finless porpoise, found from India throughout Southeast Asia to Japan, is the only species of the genus Neophocoena. The chunky Dall's porpoise is the largest species in this family, and the harbor porpoise is one of the smallest oceanic cetaceans. This family is known in the fossil record by a few fragments from scattered localities. A pattern of their history and distribution is not understood at present.

Harbor Porpoise

Phocoena phocoena

The harbor porpoise is circumpolar in ice free waters ranging south to warm temperate waters in all the oceans of the northern hemispheres. In the northeastern United States, an inshore species frequents coastal waters and the mouths of large rivers, harbors and bays. They are abundant to the east and southeast of Cape Cod, the northern Gulf of Maine, and the mouth of the Bay of Fundy. This species is seen in schools of up to 200 or more. Their local abundance often depends upon seasonal fish prey. They are considered deep divers and usually travel just below the surface and rise frequently to breathe when not feeding. They feed on several species of fish in shallow waters including cod, herring, and flounder as well as squid, clams and crustaceans. Male harbor porpoises are believed to segregate into separate schools by age while the females remain in mixed-sex schools. The gestation period is about 10 to 11 months with the frequency of births of calves reaching a peak during June and July.

The harbor porpoise is involved in marine mammal fishery conflicts in several areas of its distribution. In some areas, they may be taken incidental to fishery operations in large numbers. The extent of their involvement in U.S. fisheries is not known. The data base is not complete on this species, and an estimate of its world population cannot be made. However, the estimated population in the U.S. North Atlantic Ocean is 18,000.

Dall's Porpoise

Phocoenoides dallii

The Dall's porpoise inhabits the North Pacific Ocean in a broad arc from Japan to the Aleutian Islands and Bering Sea, the Gulf of Alaska, and along the coast of North America as far south as Baja California. Migration has not been documented, but seasonal movement of some parts of the population has been recorded. This species is one of the swiftest cetaceans known, easily achieving a speed of over 20 knots. Dall's porpoise feed on squid, lantern fish and other fish. They have heavy bodies, and adults reach about 7 ft in length and weigh up to 500 lb. This porpoise usually travels in small groups although large groups have been seen.

In the central North Pacific and Bering Sea, this species is taken accidentally in the Japanese high-seas salmon gill-net fishery and, to an unknown degree, in other gill net fisheries. A direct fishery for this species occurs off the coast of Japan. It has been considered an abundant cetacean throughout most of its range. Population estimates for this species range from 580,000 to 2.2 million, with over 920,000 animals the current estimate.

Family Monodontidae

Narwhal and Beluga Whales

The two species in this family inhabit the Arctic basin and are usually found near advancing and retracting pack and drift ice. The fossil record of the genus Delphinapterus goes back 5 million years on both the Atlantic and Pacific coasts of North America. Other fossils from this family are dated 12 to 13 million years old.

These whales do not have a dorsal fin. The snout does not have a beak and the melon is large and prominent. The flippers are fan-shaped and curve upward while the animal swims. Both species have pronounced asymetrical skulls. Separate vertebrae in the neck and a series of well developed muscles attached to crests on the skull allow the head to move with greater freedom than other cetacans.

Beluga Whale

Delphinapterus leucas

The beluga whale is generally a circumpolar Arctic basin species although some populations exist along the southern cost of Alaska, and one population is found along Cook Inlet. Throughout most of its range, the beluga is in frequent contact with the ice pack and ice floes. It does not have a dorsal fin, and its solid white coloring distinguishes it from other whales. There is a prominent keel on top of the tail, and the body is broad and expansive. This species is known for its remarkable agility, particularly the ability to twist and turn. The melon is a prominent feature of the head, and belugas show a marked ability to change the shape of this structure.

Males grow to about 16 ft; adult females are about 14 ft long. Gestation is probably 15 months, and the newborn calves are about 5 ft long. They are frequently found in shallow waters. Nursing lasts 20 months, and the reproductive cycle is about 3 years. Their diet includes salmon, capelin, pike, cod, squid, crustaceans, and other invertebrates. They break the ice with their bodies to maintain a breathing space.

Belugas are taken by natives in the circumpolar areas for subsistence. Populations of the beluga whale fluctuate widely in some areas. Because they are frequently found in shallow coastal waters and estuaries of large rivers, these populations may be subject to environmental changes. The circumpolar population is estimated between 62,000 and 88,000 animals.

Narwhal Whale

Monodon monoceros

The narwhal inhabits all the Arctic Ocean basin and is occasionally seen just below the Arctic Circle. The male narwhal is distinguished by a tusk from 3 to 5 ft long. They are a deep water species and travel in pods of 6 to 20 animals that may be segregatd by sex. When pursued, they swim in a tight group and blow in unison. Narwhals live near the pack ice throughout the year although they frequent open bays and fjords. They can become trapped in the pack ice and break newly forming ice at breathing holes by butting it with their melon. Thick ice may be broken by several animals hitting it in unison. They are preyed on by polar bears at their breathing holes; sharks are probably predators when narwhals are trapped or confined in the ice. Dives of 15 minutes are recorded for this species; a depth of 200 fathoms was reached by a harpooned animal.

Narwhals feed on Polar cod and Greenland halibut as well as squid, octopus, and crustaceans. The adult female has no functional teeth; however, there are usually two unerupted teeth in the upper jaw. There are reports of females with tusks. In the adult male, the left tooth protrudes through the gum and the blubber of the upper lip and grows in a leftward spiral. The right tooth may erupt in some animals, but it also spirals to the left. Broken tusks are quite common. The gestation period of narwhals is about 14.5 months long; the newborn are between 5 and 6 ft long and weigh about 170 lbs. This species has not been maintained in captivity with any success.

The population estimate in Arctic circumpolar regions is 30,000 animals. There are no reliable estimates for specific areas.

Family Physeteridae

Sperm Whales

The fossil records for this family of whales are about 25 million years old. Of the 20 genera and 30 species found in the family, only 3 species are living today. Two are in the genus Kogia, and are small in comparison to the sperm whale, Physeter catodon. The skull structure of the fossils suggests they had developed melons and were deep divers. The teeth in the lower jaw of the living species are relatively large and widely spaced, and they do not have any teeth in the upper jaw.

Sperm whales have specialized the general structure of the melon of toothed whales, and the liquid wax it contains quickly solidifies when exposed to air. The chemistry of these oils is different from the oil of other toothed whales. The quality and quantity of sperm whale oil resulted in the development of a large industry of sperm whaling. In the early and middle 1800's, the oil was a major source of fuel for lamps and candles in North America and Europe.

Sperm whales feed largely on several species of squid and octopus as well as several species of deep water bony fish.

Sperm Whale

Physeter catodon

Sperm whales are found in all oceans. In the eastern United States, their distribution is centered along the edge of the continental shelf with other squid-eating cetaceans. Large solitary bulls migrate from tropical and temperate latitudes to near the pack ice of the polar regions. Older and middle aged females with calves and juvenile animals segregate into schools which may be joined by sizeable numbers of medium sized bachelors to form mixed schools of 25 to 100 or more animals. They may stay close together or be dispersed over a half mile area. Several studies suggest that the large bulls returning from their high latitude migration breed with the females and maintain harems similar to sea lions and fur seals.

The head of a sperm whale is about one-third the total length of the animal, and the melon is its dominant structure. The blowhole located on the tip of the left side of the snout is connected to a complicated series of air sacks and tubes at the front of the brain case. It is the only species of cetacean to have the blowhole at the tip of the snout. Large sperm whales can dive for 60 to 75 minutes at a time. The current known record for a depth of dive is 3,609 ft by a sperm whale caught in a submarine cable. Males reach about 50 ft in length and females about 40 ft. Calves are from 10 to 16 ft long at birth and weigh about 2,150 lbs. The skin is heavily creased and folded at birth and these creases are retained in the adult. In place of a distinct dorsal fin, there is a single large hump followed by a series of small knuckles or humps. Their large distinctive blow is thrown in front of the animal at a 45° angle. Sperm whales are frequently involved in mass strandings throughout the world although most strandings occur in the tropical and temperate latitudes.

The sperm whale has been a major target species of commercial whaling over the past 30 years. In 1978, the IWC set a zero quota for take in the southern hemisphere. This species is taken under IWC quotas in Icelandic waters and off the coast of Japan. The population for this species in the southern hemisphere is estimated at 410,000 animals; in the North Atlantic, 22,000 animals and in the North Pacific, 472,000 animals.

Pygmy Sperm Whale

Kogia breviceps

Pygmy sperm whales are found in tropical and warm temperate waters. At birth, this whale is about 3.5 ft long; adults reach about 11 ft long. A distinct dorsal fin is located far back on the body. They are heavy bodied animals weighing over 1,700 lbs. They have 12 to 16 large teeth on each side of the lower jaw and occasionally in the upper jaw. The melon is similar in general structure to the sperm whale, but the head is only 10 percent of the body length. The blowhole is located immediately in front of the brain case and is slightly to the left of the midline of the animal.

Our knowledge of this species is based on stranded animals. It is the second most frequently stranded species (after the bottlenose dolphin) on the Eastern and Gulf seaboard of the United States. Studies of the food items in the stomachs indicate that they feed predominately on offshore species of squid found on the edge of the continental shelf and the open sea. Analysis of the stranding records of small groups of this species suggests that they may segregate into sexually mature and immature groups. Cow and calf pairs are frequently found stranded. Pregnant mothers with nursing calves have been found which suggests that they may give birth once a year.

Both the pygmy sperm whale and dwarf sperm whale were formerly described as rare or uncommon. However, their frequency in the stranding record indicates that they are abundant in several areas. Neither species lends itself behaviorally to observational techniques used in estimating populations. Because the blow is very thin and dissipates rapidly, it cannot be used to locate the whale. They are infrequently seen at sea, but observers have recorded groups of 4 to 10 apparently asleep at the surface with the head exposed and the tail hanging down.

There are no population estimates for this species.

Dwarf Sperm Whale

Kogia simus

Most of what is known about the dwarf sperm whale has been obtained in the last 20 years through the stranding record. Its distribution is similar to the pygmy sperm whale; although, from studies of its stomach content, this species may not be as much of a deep water dweller as the pygmy sperm whale. They are about 3 ft long at birth and 7 to 9 ft long as adults. Pregnant females with a nursing calf are known in the stranding record. There is little evidence that this species migrates or moves seasonally. They have been reported in groups of 2 to 7 animals. They feed largely on squid. Often, they have no teeth in the upper jaw, and the teeth in the lower jaw are shorter and narrower than in other species. The tall dorsal fin is similar to others in the dolphin family.

There are no population estimates for this species.

Family Ziphiidae

Beaked whales

This family contains large to medium-sized whales. In all twenty species, the snout is tapered and the lower jaw is longer than the upper jaw. They have two grooves on the throat and, in some specimens, an additional one or two grooves. The dorsal fin is located far back on the body. There is no notch in the flukes, and when the flippers are pressed against the body, they fit into depressions of the blubber on the chest.

The teeth of the beaked whale range from a full complement in Tasmacetus to tiny translucent slivers embedded in the gums in Ziphius. In the several species of Mesoplodon, the front teeth have several forms. In some species, the teeth become encrusted with barnacles since there is limited opening of the jaws. In females, the teeth are smaller; many of the rudimentary teeth in fetuses and juveniles do not persist in the adult stage.

Beaked whales have a well developed melon which suggest that they are deep diving echolocaters preying on squid as a major part of their diet. Throwing a thin rapidly dissipating blow close to the water, these whales are difficult to observe at sea. Some species photographed breaching high above the water are often heavily scarred with scratches several feet long over the head and chest. Except for the giant bottlenose whale and Baird's beaked whale, which are taken commercially, the largest source of knowledge of this family is based on the examination of stranded specimens.

Baird's Beaked Whale

Berardius bairdii

Baird's beaked whale is one of the few species of the family Ziphiidae for which basic biological information is known. It is the largest representative of the family and measures up to 40 ft long. It has a prominent beak and melon and a medium sized dorsal fin. Baird's beaked whale is found in the temperate waters of the North Pacific in an arc from Japan through the Bering Sea and down to central California. It has two teeth on each side of the lower jaw and feeds extensively on several species of squid and fish such as sardines and rock fish. Adult males reach about 32 ft in length and females about 34 ft. Gestation is probably 10 months long. This offshore, deep water species dives for an average of 10 to 20 minutes; although, dives of over an hour have been seen. They often travel in pairs, but schools of 10 or more have been observed. They breach partially out of the water.

This species is taken in coastal whaling stations in Japan. The estimated population sizes are unknown although there are reported declines in numbers in local areas.

REFERENCES

1. Advisory Committee on Marine Resources Research, Working Party on Marine Mammals. 1978. Mammals in the Seas: FAO Fisheries Series, No. 5, Volume I - Report of Working Party. Food and Agricultural Organization of the United Nations, 264 p.

2. _____ 1979. Mammals in the Seas: FAO Fisheries Series No. 5, Volume II - Pinniped Species Summaries and Reports of Sirenians. Food and Agricultural Organization of the United Nations, 151 p.

3. _____ 1981. Mammals in the Seas: FAO Fisheries Series, No. 5, Volume III - General Papers and Large Cetaceans. Food and Agricultural Organization of the United Nations, 531 p.

4. _____ 1982. Mammals in the Seas: FAO Fisheries Series, No. 5, Volume IV - Small Cetaceans, Seals, Sirenians and Otters. Food and Agricultural Organization of the United Nations, 531 p.

5. Boschung, H.T. Jr., J.D. Williams, D.W. Gotshall D.K. Caldwell, and M.C. Caldwell. 1983. The Audubon Society Field Guide to North American Fishes, Whales, and Dolphins. Alfred A. Knopf, New York, 848 p.

6. Caldwell, D.K., and M.C. Caldwell. 1972. The World of the Bottlenosed Dolphin. Lippincott: N.Y. 157 p.

7. CETAP. 1982. A Characterization of Marine Mammals and Turtles in the Mid-and North Atlantic Areas of the U.S. Outer Continental Shelf. Cetacean and Turtle Assessment Program, University of Rhode Island. Final Contract Report No. AA551-CT9-48 to the Bureau of Land Management.

8. Ellis, R. 1980. The Book of Whales. Alfred A. Knopf, New York, 202 p.

9. Ellis, R. 1982. The Book of Dolphins and Porpoises. Alfred A Knopf, New York, 270 p.

10. Gaskin, D.E. 1982. The Ecology of Whales and Dolphins. Heinemann, London, 459 p.

11. Haley, D., editor. 1978. Marine Mammals of the Eastern North Pacific and Arctic Waters. Pacific Search Press, Seattle, 256 p.

12. Harrison, R.J., R.C. Hubbard, R.S. Peterson, C.F. Rice, R.J. Shusterman, editors. 1968. The Behavior and Physiology of Pinnipeds. Appleton, Century, Crofts, New York, 411 p.

13. Katona, S.K., V. Rough, and D.T. Richardson. 1983. A Field Guide to the Whales, Porpoises and Seals of the Gulf of Maine and Eastern Canada, Cape Cod to Newfoundland. Charles Scribner's Sons, New York, 255 p.

14. King, J. 1984. Seals of the World. Second edition. Cornell University Press, Ithaca, New York, 196 p.

15. Leatherwood, S., D.K. Caldwell, and H.E. Winn. 1976. Whales, Dolphins, and Porpoises of the Western North Atlantic. NOAA Technical Report NMFS Circular 396. Superintendent of Documents, Government Printing Office, Washington, D.C., 176 p.

16. Leatherwood, S., and R.R. Reeves. 1983. The Sierra Club Handbook of Whales and Dolphins. Sierra Club Books, San Francisco, 302 p.

17. Leatherwood, S., R.R. Reeves, W.F. Perrin, and W.E. Evans. 1982. Whales, Dolphins, and Porpoises of the Eastern North Pacific and Adjacent Arctic Waters. NOAA Technical Report NMFS Circular 444. Superintendent of Documents, Government Printing Office, Washington, D.C., 245 p.

18. Lockley, R.M. 1979. Whales, Dolphins and Porpoises. W.W. Norton and Co., New York, 200 p.

19. Mansfield, A.W., K. Ronald, editors. 1975. Biology of the Seal. Proceedings of a symposium held in Guelph Denmark, August 14-17, 1972. Rapports et Proces-Verbaux des Re'unions Volume 169. Consiel International Pour L'exploration de la Mer, 537 p.

20. Matthews, L.H. 1978. The Natural History of the Whale, Columbia University Press, New York. 219 p.

21. Mitchell, E.D., editor. 1975. Review of Biology and Fisheries for Small Cetaceans. Journal of the Fisheries Research Board of Canada. Volume 32, No. 7. Special Issue, 1,235 p.

22. Ridgway, S.H., and R.J. Harrison, editors. 1981. Handbook of Marine Mammals. Volume 1 - The Walrus, Sea Lions, Fur Seals and Sea Otter. Academic Press, London, 235 p.

23. Ridgway, S.H., and R.J. Harrison, editors. 1981. Handbook of Marine Mammals. Volume 2 - Seals. Academic Press, London, 359 p.

24. Watson, L. 1981. Sea Guide to Whales of the World. E.P. Dutton, New York, 302 p.

TABLE 1: 1984 GENERAL PERMIT--COMMERCIAL FISHING INCIDENTAL TAKE--REQUEST AND AUTHORIZATION

Applicant/Category	Otariidae						Phocidae				Cetacea		Total	
PACIFIC OCEAN	northern sea lion		northern fur seal		California sea lion		harbor seal		elephant seal					
	Requested	Authorized	Requested	Authorized	Requested	Authorized	Requested	Authorized	Requested	Authorized	Requested	Authorized	Requested	Authorized
Domestic (NPFVO)														
I	1,000	1,000	10	10	0	0	10	10	0	0	10	10	1,030	1,030
III	500	300	5	5	0	0	200	200	0	0	10	10	715	515
IV	20	20	5	5	0	0	5	5	0	0	0	0	30	30
V	1,000	750	10	10	0	0	1,800	1,200	0	0	200a/	100	3,010	2,060
Domestic (PCFFA)														
I	10	10	5	5	20	20	10	10	10	10	0	0	55	55
III	0	0	0	0	100	100	25	25	0	0	60	50b/	185	175
IV	0	0	0	0	15	15	5	5	0	0	0	0	20	20
V	50	50	10	10	1,700	1,700	700	700	50	50	45	30c/	2,555	2,540
Domestic (Hawaii)	0	0	10	10	0	0	0	0	0	0	H	0	0	0
Japan														
Deepsea I	120	120	10	10	0	0	15	15	0	0	20d/	4	165	149
Hokuten I	85	55	5	5	0	0	5	5	0	0	0	0	95	65
Longline V	0	0	0	0	0	0	0	0	0	0	H	0	0	0
Salmon V	25	25	450	450	0	0	0	0	0	0	5,600e/	5,500	6,075	5,975
Republic of Korea I	100	95	0	5	0	0	100	15	0	0	50	5	250	120
West Germany I	25	24	1	1	0	0	10	10	0	0	10	5	45	40

Table2: 1984 GENERAL PERMIT--COMMERCIAL FISHING INCIDENTAL TAKE--REQUEST AND AUTHORIZATION

Applicant/Category	Otariidae						Phocidae				Cetacea		Total	
ATLANTIC OCEAN	northern sea lion		northern fur seal		California sea lion		harbor seal		elephant seal					
	Requested	Authorzied	Requested	Authorized	Requested	Authorized	Requested	Authorized	Requested	Authorized	Requested	Authorized	Requested	Authorized
Domestic--New England Groundfish Gillnetters--ST	0	0	0	0	0	0	100	50	0	0	200f/	180	300	230
Domestic--Atlantic Shelf Fisheries I	0	0	0	0	0	0	10	10	0	0	10	10g/	20	20
Portugal I	0	0	0	0	0	0	20	20	0	0	20	20g/	40	40
German Democratic Republic I	0	0	0	0	0	0	8	8	0	0	10	10g/	18	18
Spain I	0	0	0	0	0	0	20	5	0	0	20	10g/	40	15
Italy I	0	0	0	0	0	0	20	5	0	0	20	10g/	40	15
Netherlands I	0	0	0	0	0	0	5	5	0	0	15	10g/	20	15
Totals	2,935	2,449	510	516	1,835	1,835	2,885 Pacific 183 Atlantic	2,200 Pacific 103 Atlantic	60	60	6,005 Pacific 275 Atlantic	5,714 Pacific 250 Atlantic	14,688	13,112

NOTES:

a/ Dall's porpoise, harbor porpoise, beluga whale
b/ pilot whales (30, harbor porpoise (0), Dall's porpoise (5), common (5), whitesided (5) and bottlenosed dolphins (5)
c/ pilot whales (10), harbor porpoise (0), Dall's porpoise (10) and whitesided dolphins (10)
d/ pilot whales, harbor porpoise, Atlantic whitesided and bottlenosed dolphins
e/ Dall's porpoise
f/ harbor porpoise
g/ total cetacean take by all permit holders fishing in the North Atlantic Ocean may not exceed 622 common dolphins, 711 Atlantic whitesided dolphins, 365 harbor porpoise, 338 Stenella spp., 248 pilot whales, 234 grampus, 172 bottlenose dolphins, 4 beaked whales

H harassment only
ST Small take exemption

TABLE 3

COMMON AND SCIENTIFIC NAMES OF MARINE MAMMALS INVOLVED IN SCIENTIFIC RESEARCH/PUBLIC DISPLAY PERMIT APPLICATIONS

CETACEANS

COMMON NAME	SCIENTIFIC NAME
ATLANTIC BOTTLENOSE DOLPHIN	TURSIOPS TRUNCATUS
ATLANTIC SPOTTED DOLPHIN	STENELLA PLAGIODON
ATLANTIC WHITE-SIDED DOLPHIN	LAGENORHYNCHUS ACUTUS
BAIRD'S BEAKED WHALE	BERARDIUS BAIRDII
BLACK RIGHT WHALE, NORTHERN RIGHT	BALAENA GLACIALIS
BLAINVILLE'S BEAKED WHALE	MESOPLODON DENSIROSTRIS
BLUE WHALE	BALAENOPTERA MUSCULUS
BOTTLENOSE DOLPHINS	TURSIOPS SP.
BOTTLENOSE WHALES	HYPEROODON SP.
BOWHEAD WHALE	BALAENA MYSTICETUS
BRYDE'S WHALE	BALAENOPTERA EDENI
COMMERSON'S DOLPHIN	CEPHALORHYNCHUS COMMERSONII
COMMON DOLPHIN	DELPHINUS DELPHIS
CUVIER'S BEAKED WHALE	ZIPHIUS CAVIROSTRIS
DALL'S PORPOISE	PHOCOENOIDES DALLI
DUSKY DOLPHIN	LAGENORHYNCHUS OBSCURUS
DWARF SPERM WHALE	KOGIA SIMUS
FALSE KILLER WHALE	PSEUDORCA CRASSIDENS
FIN WHALE, FINBACK	BALAENOPTERA PHYSALUS
FINLESS PORPOISE	NEOPHOCAENA PHOCAENOIDES
FRANCISCANA	PONTOPORIA BLAINVILLEI
FRASER'S (SARAWAK) DOLPHIN	LAGENODELPHIS HOSEI
GINKGO-TOOTHED BEAKED WHALE	MESOPLODON GINKGODENS
GRAY WHALE	ESCHRICHTIUS ROBUSTUS
GRAY'S BEAKED WHALE	MESOPLODON GRAYI
HARBOR PORPOISE	PHOCOENA PHOCOENA
HEAVISIDE'S DOLPHIN	CEPHALORHYNCHUS HEAVISIDII
HUBBS' BEAKED WHALE	MESOPLODON CARLHUBBSI
HUMPBACK WHALE	MEGAPTERA NOVAEANGLIAE
KILLER WHALE	ORCINUS ORCA
LAGENORHYNCHINE DOLPHINS	LAGENORHYNCHUS SP.
LONG-FINNED PILOT WHALE	GLOBICEPHALA MELAENA
MELON-HEADED WHALE, ELECTRA	PEPONOCEPHALA ELECTRA
MINKE WHALE	BALAENOPTERA ACUTOROSTRATA
NARWHAL	MONODON MONOCEROS
NORTHERN BOTTLENOSE WHALE	HYPEROODON AMPULLATUS
NORTHERN RIGHT WHALE DOLPHIN	LISSODELPHIS BOREALIS
PACIFIC WHITE-SIDED DOLPHIN	LAGENORHYNCHUS OBLIQUIDENS
PILOT WHALES UNSPECIFIED	GLOBICEPHALA SP.
PYGMY KILLER WHALE	FERESA ATTENUATA
PYGMY RIGHT WHALE	CAPEREA MARGINATA
PYGMY SPERM WHALE	KOGIA BREVICEPS
RIGHT WHALES UNSPECIFIED	BALAENA SP.
RISSO'S DOLPHIN, GRAMPUS	GRAMPUS GRISEUS
ROUGH-TOOTHED DOLPHIN	STENO BREDANENSIS

Table 3 - continued

COMMON NAME	SCIENTIFIC NAME
SEI WHALE	BALAENOPTERA BOREALIS
SHEPHERD'S BEAKED WHALE	TASMACETUS SHEPHERDI
SHORT-FINNED PILOT WHALE	GLOBICEPHALA MACRORHYNCHUS
SOUTHERN RIGHT WHALE	BALAENA AUSTRALIS
SPERM WHALE	PHYSETER CATODON
SPINNER DOLPHIN	STENELLA LONGIROSTRIS
SPOTTED DOLPHIN	STENELLA ATTENUATA
SPOTTED DOLPHIN	STENELLA FRONTALIS
STENELLINE DOLPHINS	STENELLA SP.
STRAP-TOOTHED WHALE	MESOPLODON LAYARDII
STRIPED DOLPHIN, STREAKER	STENELLA COERULEOALBA
TRUE'S BEAKED WHALE	MESOPLODON MIRUS
UNSPECIFIED CETACEANS	CETACEA
UNSPECIFIED TOOTHED WHALES	ODONTOCETI
VAQUITA, COCHITO	PHOCOENA SINUS
WHITE WHALE, BELUKHA	DELPHINAPTERUS LEUCAS
WHITE-BEAKED DOLPHIN	LAGENORHYNCHUS ALBIROSTRIS

PINNIPEDS/SIRENIANS

AMSTERDAM ISLAND FUR SEAL	ARCTOCEPHALUS TROPICALIS
ARCTOCEPHALINE FUR SEALS	ARCTOCEPHALUS SP.
ATLANTIC HARBOR SEAL	PHOCA VITULINA VITULINA
BAIKAL SEAL	PHOCA SIBIRICA
BEARDED SEAL	ERIGNATHUS BARBATUS
CALIFORNIA SEA LION	ZALOPHUS CALIFORNIANUS
CASPIAN SEAL	PHOCA CASPICA
CRABEATER SEAL	LOBODON CARCINOPHAGUS
DUGONG	DUGONG DUGON
GRAY SEAL	HALICHOERUS GRYPUS
HARBOR SEALS	PHOCA VITULINA
HARP SEAL, GREENLAND SEAL	PHOCA GROENLANDICA
HAWAIIAN MONK SEAL	MONACHUS SCHAUINSLANDI
HOODED SEAL, BLADDERNOSE SEAL	CYSTOPHORA CRISTATA
KERGUELEN FUR SEAL	ARCTOCEPHALUS GAZELLA
LARGHA SEAL, SPOTTED SEAL	PHOCA LARGHA
LEOPARD SEAL	HYDRURGA LEPTONYX
NORTHERN ELEPHANT SEAL	MIROUNGA ANGUSTIROSTRIS
NORTHERN FUR SEAL	CALLORHINUS URSINUS
NORTHERN SEA LION, STELLER SEA LION	EUMETOPIAS JUBATUS
PACIFIC HARBOR SEAL	PHOCA VITULINA RICHARDI
RIBBON SEAL	PHOCA FASCIATA
RINGED SEAL	PHOCA HISPIDA
ROSS SEAL	OMMATOPHOCA ROSSII
SOUTH AFRICAN FUR SEAL	ARCTOCEPHALUS PUSILLUS
SOUTH AMERICAN SEA LION	OTARIA FLAVESCENS
SOUTHERN ELEPHANT SEAL	MIROUNGA LEONINA
UNSPECIFIED MARINE MAMMALS	UNSPECIFIED MARINE MAMMALS
UNSPECIFIED PINNIPEDS	PINNIPEDIA
WALRUS	ODOBENUS ROSMARUS
WEDDELL SEAL	LEPTONYCHOTES WEDDELLI
WEST INDIAN MANATEE	TRICHECHUS MANATUS
WESTERN ATLANTIC HARBOR SEAL	PHOCA VITULINA CONCOLOR

TABLE 4
SYNOPSIS OF PERMIT APPLICATIONS

	AS OF March 31, 1983			April 1, 1983 TO March 31, 1984			
	SCIENTIFIC RESEARCH	PUBLIC DISPLAY	SCIENTIFIC AND PUBLIC DISPLAY	SCIENTIFIC RESEARCH	PUBLIC DISPLAY	SCIENTIFIC AND PUBLIC DISPLAY	AS OF March 31, 1984 CUMULATIVE TOTAL
NO. OF APPLICATIONS SUBMITTED	259	284	11	29	27	3	613
NO. OF ANIMALS REQUESTED(TOTAL)	641,240	1,521	571	31,805	415	5,863	681,415
OF THESE:							
TAKEN BY KILLING	23,172	0	0	0	0	0	23,172
TAKEN AND KEPT ALIVE	411	1,269	117	4	77	5	1,883
KILLED IN CAPTIVITY	49	0	0	0	0	0	49
TAKEN AND RELEASED	541,786	44	451	12,385	0	0	554,666
FOUND DEAD	1,759	0	0	1,915	1	0	3,675
STRANDED/EXCHANGED	114	208	3	0	37	0	362
IMPORTS	3,073	0	0	1	0	0	3,074
HARASS	70,876	0	0	17,500	300	5,858	94,534
ACTION TAKEN							
NO. OF APPLICATIONS FORWARDED TO MARINE MAMMAL COMMISSION	216	212	6	27	14	1	476
NO. OF APPLICATIONS REVIEWED BY MARINE MAMMAL COMMISSION	214	209	6	20	14	1	464
NO. OF APPLICATIONS WITHDRAWN	6	17	1	0	0	0	24
NO. OF APPLICATIONS REFERRED TO FISH AND WILDLIFE	1	0	0	0	0	0	1
NO. OF APPLICATIONS REFERRED TO STATES	14	1	0	0	0	0	15
NO. OF APPLICATIONS REFERRED TO REGIONS	5	14	2	0	0	0	21
NO. OF APPLICATIONS RESOLVED THROUGH AGREEMENT	1	2	0	0	0	0	3
NO. OF APPLICATIONS RETURNED DUE TO INSUFFICIENT OR INAPPROPRIATE SUBMITTAL	20	45	2	1	5	2	75
NO. OF APPLICATIONS DENIED	2	8	0	0	0	0	10
NO. OF APPLICATIONS APPROVED	210	197	6	18	13	1	445
NO. OF APPLICATIONS PENDING	0	0	0	10	9	0	19
NO. OF ANIMALS APPROVED(TOTAL)	632,743	926	363	11,650	54	5,550	651,286
OF THESE:							
TAKEN BY KILLING	21,655	0	0	0	0	0	21,655
TAKEN AND KEPT ALIVE	381	772	98	0	34	0	1,285
KILLED IN CAPTIVITY	49	0	0	0	0	0	49
TAKEN AND RELEASED	540,067	0	265	9,575	0	0	549,907
FOUND DEAD	1,112	0	0	1,825	0	0	2,937
STRANDED/EXCHANGED	99	154	0	0	20	0	273
IMPORTS	3,051	0	0	0	0	0	3,051
HARASS	66,329	0	0	250	0	5,550	72,129

NOTE: APPLICATIONS AND PERMITS INVOLVING HARASSMENT OF MARINE MAMMALS OR TAKING/IMPORTING OF MARINE MAMMALS FOUND DEAD USUALLY DO NOT SPECIFY NUMBERS, AND THEREFORE ARE NOT REFLECTED IN THE NUMBERS OF ANIMALS FOR THESE CATEGORIES.

TABLE 5
NUMBER OF CETACEANS REQUESTED IN SCIENTIFIC RESEARCH/PUBLIC DISPLAY PERMIT APPLICATIONS(1)

	REQUESTED AS OF March 31, 1983					REQUESTED April 1, 1983 THRU March 31, 1984					
COMMON NAME	TAKEN BY KILLING	TAKEN AND KEPT ALIVE	KILLED IN CAPTIVITY	TAGGED OR TAKEN AND RELEASED	FOUND DEAD/ STRND	TAKEN BY KILLING	TAKEN AND KEPT ALIVE	KILLED IN CAPTIVITY	TAGGED OR TAKEN AND RELEASED	FOUND DEAD/ STRND	CUMMULATIVE TOTAL REQUESTED
ATLANTIC SPOTTED DOLPHIN	------	10	------	------	------	------	------	------	------	------	10
ATLANTIC WHITE-SIDED DOLPHIN	------	6	------	15	------	------	------	------	------	------	21
BAIRD'S BEAKED WHALE	------	------	------	25	6	------	------	------	------	------	31
BLACK RIGHT WHALE, NORTHERN RIGHT	------	------	------	10	------	------	------	------	------	------	10
BLUE WHALE	------	------	------	75	------	------	------	------	------	------	75
BOTTLENOSE DOLPHINS	70	680	------	51,319	35	------	58	------	------	------	52,162
BOWHEAD WHALE	------	------	------	170	190	------	------	------	40	------	400
BRYDE'S WHALE	------	------	------	420	------	------	------	------	------	1	421
COMMERSON'S DOLPHIN	------	26	------	------	------	------	12	------	------	------	38
COMMON DOLPHIN	155	26	------	75,742	9	------	------	------	------	------	75,932
CUVIER'S BEAKED WHALE	------	2	------	------	------	------	------	------	------	------	2
DALL'S PORPOISE	960	4	------	910	18	------	------	------	------	------	1,892
DUSKY DOLPHIN	------	------	------	76	------	------	------	------	------	------	76
DWARF SPERM WHALE	------	------	------	------	3	------	------	------	------	------	3
FALSE KILLER WHALE	------	15	------	6	------	------	------	------	------	------	21
FIN WHALE, FINBACK	------	------	------	415	------	------	------	------	------	------	415
FINLESS PORPOISE	------	6	------	------	------	------	------	------	------	------	6
FRASER'S (SARAWAK) DOLPHIN	70	------	------	1,050	------	------	------	------	------	------	1,120
GINKGO-TOOTHED BEAKED WHALE	------	------	------	------	3	------	------	------	------	------	3
GRAY WHALE	------	------	------	232	101	------	------	------	100	------	433
HARBOR PORPOISE	------	12	------	203	49	------	------	------	------	1,340	1,604
HUBBS' BEAKED WHALE	------	------	------	------	6	------	------	------	------	------	6
HUMPBACK WHALE	------	------	------	795	------	------	------	------	100	------	895
KILLER WHALE	------	53	------	317	23	------	1	------	------	------	394
LONG-FINNED PILOT WHALE	------	2	------	------	30	------	------	------	------	------	32
MELON-HEADED WHALE, ELECTRA	45	4	------	300	------	------	------	------	------	------	349
MINKE WHALE	------	------	------	890	3	------	------	------	------	------	893
NARWHAL	------	4	------	------	------	------	------	------	------	------	4
NORTHERN RIGHT WHALE DOLPHIN	------	2	------	130	18	------	------	------	------	------	150
PACIFIC WHITE-SIDED DOLPHIN	------	58	------	527	48	------	------	------	------	------	633
PILOT WHALES UNSPECIFIED	------	12	------	15	------	------	------	------	------	------	27
PYGMY KILLER WHALE	45	8	------	300	------	------	------	------	------	------	353
PYGMY SPERM WHALE	------	------	------	15	6	------	------	------	------	------	21
RISSO'S DOLPHIN, GRAMPUS	70	12	------	1,105	15	------	------	------	------	------	1,202
ROUGH-TOOTHED DOLPHIN	70	9	------	5,050	------	------	------	------	------	------	5,129
SEI WHALE	------	------	------	470	------	------	------	------	------	------	470
SHORT-FINNED PILOT WHALE	70	39	------	135	33	------	2	------	------	------	279
SOUTHERN RIGHT WHALE	------	------	------	10	------	------	------	------	------	------	10
SPERM WHALE	------	------	------	1,055	------	------	------	------	------	------	1,055
SPINNER DOLPHIN	2,929	40	------	103,967	------	------	------	------	------	------	106,936
SPOTTED DOLPHIN	4,925	16	------	157,793	------	------	------	------	------	------	162,734
STENELLINE DOLPHINS	------	------	------	100	3	------	------	------	------	------	103
STRIPED DOLPHIN, STREAKER	100	------	------	50,065	------	------	------	------	------	------	50,165
UNSPECIFIED CETACEANS	370	43	------	1,241	------	------	------	------	------	------	1,654
VAQUITA, COCHITO	------	------	------	------	2	------	------	------	------	------	2
WHITE WHALE, BELUKHA	90	32	------	870	80	------	9	------	------	------	1,081
WHITE-BEAKED DOLPHIN	------	2	------	------	------	------	------	------	------	------	2
TOTALS:(2)	9,969	1,123	0	455,818(3)	681	0	82	0	240	1,341	469,254

(1) SPECIMEN IMPORTS AND HARASSMENT REQUESTS NOT INCLUDED IN THIS TABLE.
(2) WHERE PERMIT APPLICANTS REQUESTED A TOTAL NUMBER OF ANIMALS TO BE TAKEN WITHOUT SPECIFYING THE NUMBER TO BE TAKEN FROM A

TABLE 6

NUMBER OF PINNIPEDS REQUESTED IN SCIENTIFIC RESEARCH/PUBLIC DISPLAY PERMIT APPLICATIONS(1)

	REQUESTED AS OF March 31, 1983					REQUESTED April 1, 1983 THRU March 31, 1984					
COMMON NAME	TAKEN BY KILLING	TAKEN AND KEPT ALIVE	KILLED IN CAPTIVITY	TAGGED OR TAKEN AND RELEASED	FOUND DEAD/ STRND	TAKEN BY KILLING	TAKEN AND KEPT ALIVE	KILLED IN CAPTIVITY	TAGGED OR TAKEN AND RELEASED	FOUND DEAD/ STRND	CUMMULATIVE TOTAL REQUESTED
ARCTOCEPHALINE FUR SEALS	2	------	------	80	------	------	------	------	-------	------	82
BAIKAL SEAL	------	4	------	-------	------	------	------	------	-------	------	4
BEARDED SEAL	880	8	------	400	70	------	------	------	-------	------	1,358
CALIFORNIA SEA LION	534	965	4	5,157	597	------	4	------	1,225	27	8,513
CASPIAN SEAL	------	2	------	-------	------	------	------	------	-------	------	2
CRABEATER SEAL	3,288	------	------	9,055	------	------	------	------	-------	------	12,343
GRAY SEAL	------	40	------	-------	1	------	------	------	-------	------	41
HARBOR SEALS	7,789	139	------	6,632	224	------	------	------	1,440	506	16,730
HARP SEAL, GREENLAND SEAL	------	40	------	-------	------	------	------	------	-------	------	40
HAWAIIAN MONK SEAL	16	5	------	3,949	------	------	------	------	-------	------	3,970
KERGUELEN FUR SEAL	151	------	------	980	------	------	------	------	-------	------	1,131
LARGHA SEAL, SPOTTED SEAL	1,120	------	------	1,100	------	------	------	------	-------	------	2,220
LEOPARD SEAL	688	8	------	3,130	------	------	------	------	-------	------	3,826
NORTHERN ELEPHANT SEAL	154	18	------	29,298	303	------	------	------	9,520	4	39,297
NORTHERN FUR SEAL	------	35	------	9	3	------	------	------	-------	------	47
NORTHERN SEA LION, STELLER SEA LION	16,315	4	------	12,619	116	------	------	------	-------	75	29,129
RIBBON SEAL	755	2	------	400	------	------	------	------	-------	------	1,157
RINGED SEAL	1,680	12	------	707	125	------	------	------	-------	------	2,524
ROSS SEAL	283	6	------	1,115	------	------	------	------	-------	------	1,404
SOUTH AFRICAN FUR SEAL	------	6	------	10	------	------	------	------	-------	------	16
SOUTH AMERICAN SEA LION	------	14	------	-------	------	------	------	------	-------	------	14
SOUTHERN ELEPHANT SEAL	153	------	------	490	------	------	------	------	-------	------	643
UNSPECIFIED MARINE MAMMALS	------	------	------	-------	50	------	------	------	-------	------	50
UNSPECIFIED PINNIPEDS	13,600	------	12	100	------	------	------	------	-------	------	13,712
WALRUS	600	------	------	-------	------	------	------	------	-------	------	600
WEDDELL SEAL	609	25	37	11,340	------	------	------	------	-------	------	12,011
WEST INDIAN MANATEE	------	1	------	-------	------	------	------	------	-------	------	1
TOTALS:(2)	48,617	1,334	53	86,571	1,489	0	4	0	12,185	612	150,865

(1) SPECIMEN IMPORTS AND HARASSMENT REQUESTS NOT INCLUDED IN THIS TABLE.

(2) WHERE PERMIT APPLICANTS REQUESTED A TOTAL NUMBER OF ANIMALS TO BE TAKEN WITHOUT SPECIFYING THE NUMBER TO BE TAKEN FROM A PARTICULAR SPECIES, THE NUMBER REQUESTED WAS LISTED UNDER UNSPECIFIED PINNIPEDS OR UNSPECIFIED MARINE MAMMALS, IF CETACEANS ALSO WERE INVOLVED.

TABLE 7

NUMBER OF CETACEANS AUTHORIZED IN SCIENTIFIC RESEARCH/PUBLIC DISPLAY PERMIT APPLICATIONS(1)

COMMON NAME	AUTHORIZED AS OF March 31, 1983					AUTHORIZED April 1, 1983 THRU March 31, 1984					CUMMULATIVE TOTAL AUTHORIZED
	TAKEN BY KILLING	TAKEN AND KEPT ALIVE	KILLED IN CAPTIVITY	TAGGED OR TAKEN AND RELEASED	FOUND DEAD/ STRND	TAKEN BY KILLING	TAKEN AND KEPT ALIVE	KILLED IN CAPTIVITY	TAGGED OR TAKEN AND RELEASED	FOUND DEAD/ STRND	
ATLANTIC WHITE-SIDED DOLPHIN	------	6	------	5	------	------	------	------	-------	------	11
BLACK RIGHT WHALE, NORTHERN RIGHT	------	------	------	10	------	------	------	------	-------	------	10
BLUE WHALE	------	------	------	40	------	------	------	------	-------	------	40
BOTTLENOSE DOLPHINS	70	487	------	51,309	21	------	12	------	-------	------	51,899
BOWHEAD WHALE	------	------	------	170	190	------	------	------	-------	------	360
BRYDE'S WHALE	------	------	------	410	------	------	------	------	-------	------	410
COMMERSON'S DOLPHIN	------	------	------	-------	------	------	12	------	-------	------	12
COMMON DOLPHIN	155	18	------	75,727	------	------	------	------	-------	------	75,900
DALL'S PORPOISE	960	------	------	910	------	------	------	------	-------	------	1,870
DUSKY DOLPHIN	------	------	------	76	------	------	------	------	-------	------	76
FALSE KILLER WHALE	------	12	------	6	------	------	------	------	-------	------	18
FIN WHALE, FINBACK	------	------	------	370	------	------	------	------	-------	------	370
FRASER'S (SARAWAK) DOLPHIN	70	------	------	1,050	------	------	------	------	-------	------	1,120
GRAY WHALE	------	------	------	232	100	------	------	------	-------	------	332
HARBOR PORPOISE	------	6	------	105	1	------	------	------	-------	1,250	1,362
HUMPBACK WHALE	------	------	------	725	------	------	------	------	60	------	785
KILLER WHALE	------	24	------	175	------	------	------	------	-------	------	199
LONG-FINNED PILOT WHALE	------	2	------	-------	30	------	------	------	-------	------	32
MELON-HEADED WHALE, ELECTRA	45	4	------	300	------	------	------	------	-------	------	349
MINKE WHALE	------	------	------	860	------	------	------	------	-------	------	860
NORTHERN RIGHT WHALE DOLPHIN	------	------	------	130	------	------	------	------	-------	------	130
PACIFIC WHITE-SIDED DOLPHIN	------	29	------	527	------	------	------	------	-------	------	556
PILOT WHALES UNSPECIFIED	------	8	------	-------	------	------	------	------	-------	------	8
PYGMY KILLER WHALE	45	4	------	300	------	------	------	------	-------	------	349
RISSO'S DOLPHIN, GRAMPUS	70	8	------	1,105	------	------	------	------	-------	------	1,183
ROUGH-TOOTHED DOLPHIN	70	9	------	5,050	------	------	------	------	-------	------	5,129
SEI WHALE	------	------	------	440	------	------	------	------	-------	------	440
SHORT-FINNED PILOT WHALE	70	29	------	135	------	------	2	------	-------	------	236
SPERM WHALE	------	------	------	860	------	------	------	------	-------	------	860
SPINNER DOLPHIN	2,929	21	------	103,967	------	------	------	------	-------	------	106,917
SPOTTED DOLPHIN	4,925	10	------	157,793	------	------	------	------	-------	------	162,728
STENELLINE DOLPHINS	------	------	------	100	------	------	------	------	-------	------	100
STRIPED DOLPHIN, STREAKER	100	------	------	50,050	------	------	------	------	-------	------	50,150
UNSPECIFIED CETACEANS	340	43	------	914	------	------	------	------	-------	------	1,297
VAQUITA, COCHITO	------	------	------	-------	2	------	------	------	-------	------	2
WHITE WHALE, BELUKHA	25	24	------	870	80	------	8	------	-------	------	1,007
WHITE-BEAKED DOLPHIN	------	2	------	-------	------	------	------	------	-------	------	2
TOTALS:(2)	9,874	746	0	454,721(3)	424	0	34	0	60	1,250	467,109

(1) SPECIMEN IMPORTS AND HARASSMENT ACTIVITIES NOT INCLUDED IN THIS TABLE.
(2) WHERE A PERMIT SPECIFIED THE TOTAL NUMBER OF ANIMALS TO BE TAKEN WITHOUT SPECIFYING THE NUMBER TO BE TAKEN FROM A PARTICULAR SPECIES, THE NUMBER AUTHORIZED WAS LISTED UNDER UNSPECIFIED CETACEA.
(3) A SINGLE PERMIT AUTHORIZED 432,850 CETACEANS AND ACCOUNTS FOR NEARLY THE TOTAL NUMBER IN THIS CATEGORY.

TABLE 8

NUMBER OF PINNIPEDS AUTHORIZED IN SCIENTIFIC RESEARCH/PUBLIC DISPLAY PERMIT APPLICATIONS(1)

COMMON NAME	AUTHORIZED AS OF March 31, 1983					AUTHORIZED April 1, 1983 THRU March 31, 1984					CUMMULATIVE TOTAL AUTHORIZED
	TAKEN BY KILLING	TAKEN AND KEPT ALIVE	KILLED IN CAPTIVITY	TAGGED OR TAKEN AND RELEASED	FOUND DEAD/ STRND	TAKEN BY KILLING	TAKEN AND KEPT ALIVE	KILLED IN CAPTIVITY	TAGGED OR TAKEN AND RELEASED	FOUND DEAD/ STRND	
ARCTOCEPHALINE FUR SEALS	2	------	------	80	------	------	------	------	-------	------	82
BAIKAL SEAL	------	4	------	-------	------	------	------	------	-------	------	4
BEARDED SEAL	660	8	------	400	70	------	------	------	-------	------	1,138
CALIFORNIA SEA LION	534	357	2	5,127	444	------	------	------	25	14	6,503
CASPIAN SEAL	------	2	------	-------	------	------	------	------	-------	------	2
CRABEATER SEAL	3,288	------	------	9,055	------	------	------	------	-------	------	12,343
GRAY SEAL	------	29	------	5	------	------	------	------	-------	------	34
HARBOR SEALS	1,662	100	------	6,362	62	------	------	------	240	506	8,932
HARP SEAL, GREENLAND SEAL	------	40	------	-------	------	------	------	------	-------	------	40
HAWAIIAN MONK SEAL	16	3	------	3,536	------	------	------	------	-------	------	3,555
KERGUELEN FUR SEAL	151	------	------	980	------	------	------	------	-------	------	1,131
LARGHA SEAL, SPOTTED SEAL	920	------	------	1,100	------	------	------	------	-------	------	2,020
LEOPARD SEAL	688	8	------	3,130	------	------	------	------	-------	------	3,826
NORTHERN ELEPHANT SEAL	154	11	------	29,298	282	------	------	------	9,250	------	38,995
NORTHERN FUR SEAL	------	20	------	-------	------	------	------	------	-------	------	20
NORTHERN SEA LION, STELLER SEA LION	800	4	------	12,619	8	------	------	------	-------	75	13,506
RIBBON SEAL	655	2	------	400	------	------	------	------	-------	------	1,057
RINGED SEAL	1,400	12	------	704	125	------	------	------	-------	------	2,241
ROSS SEAL	283	6	------	1,115	------	------	------	------	-------	------	1,404
SOUTH AFRICAN FUR SEAL	------	------	------	10	------	------	------	------	-------	------	10
SOUTH AMERICAN SEA LION	------	12	------	-------	------	------	------	------	-------	------	12
SOUTHERN ELEPHANT SEAL	153	------	------	490	------	------	------	------	-------	------	643
UNSPECIFIED MARINE MAMMALS	15	------	------	15	------	------	------	------	-------	------	30
UNSPECIFIED PINNIPEDS	20	------	12	100	25	------	------	------	-------	------	157
WALRUS	200	------	------	-------	------	------	------	------	-------	------	200
WEDDELL SEAL	609	25	37	11,181	------	------	------	------	-------	------	11,852
TOTALS:(2)	12,210	643	51	85,707	1,016	0	0	0	9,515	595	109,737

(1) SPECIMEN IMPORTS AND HARASSMENT ACTIVITIES NOT INCLUDED IN THIS TABLE.

(2) WHERE A PERMIT SPECIFIED THE TOTAL NUMBER OF ANIMALS TO BE TAKEN WITHOUT SPECIFYING THE NUMBER TO BE TAKEN FROM A PARTICULAR SPECIES, THE NUMBER AUTHORIZED WAS LISTED UNDER UNSPECIFIED PINNIPEDS OR UNSPECIFIED MARINE MAMMALS, IF CETACEANS WERE ALSO INVOLVED.

TABLE 9
SUMMARY OF PERMITS FOR PERMANENT REMOVAL FROM THE WILD - CETACEANS
AS OF March 31, 1984

SPECIES	******** PERMITS ********			********** NUMBER OF ANIMALS **********					
	ISSUED	EXPIRED	CURRENT	REQUESTED	AUTHORIZED	REPLACEMENTS	AUTHORIZATION EXPIRED	TAKEN (1)	TAKE REMAINING
ATLANTIC WHITE-SIDED DOLPHIN	1	1	0	6	6	0	6	0	0
BOTTLENOSE DOLPHINS	94	75	19	558	540	31	118	383	99
COMMERSON'S DOLPHIN	1	0	1	12	12	0	0	12	0
COMMON DOLPHIN	5	4	1	181	173	5	149	27	2
DALL'S PORPOISE	1	0	1	960	960	0	0	0	960
FALSE KILLER WHALE	4	2	2	12	12	0	2	5	5
FRASER'S (SARAWAK) DOLPHIN	2	2	0	70	70	0	70	0	0
HARBOR PORPOISE	1	1	0	6	6	0	6	0	0
KILLER WHALE	5	4	1	21	20	0	0	11	10
LONG-FINNED PILOT WHALE	1	1	0	2	2	0	2	0	0
MELON-HEADED WHALE, ELECTRA	3	2	1	49	49	0	45	2	2
PACIFIC WHITE-SIDED DOLPHIN	5	3	2	23	23	0	8	30	12
PYGMY KILLER WHALE	3	2	1	49	49	0	45	0	4
RISSO'S DOLPHIN, GRAMPUS	4	2	2	78	78	0	70	1	7
ROUGH-TOOTHED DOLPHIN	5	3	2	79	79	2	72	2	7
SHORT-FINNED PILOT WHALE	12	8	4	99	98	3	76	18	8
SPINNER DOLPHIN	4	3	1	2,956	2,950	3	2,776	179	3
SPOTTED DOLPHIN	3	3	0	4,935	4,935	0	4,676	271	0
STRIPED DOLPHIN, STREAKER	1	1	0	100	100	0	100	0	0
UNSPECIFIED CETACEANS	4	4	0	383	383	0	383	0	0
WHITE WHALE, BELUKHA	10	4	6	53	53	1	15	23	20
WHITE-BEAKED DOLPHIN	1	0	1	2	2	0	0	6	2
TOTAL NUMBER OF ANIMALS:				10,634	10,600	45	8,619	970	1,141

(1) ANIMALS TAKEN INCLUDE THOSE INADVERTENTLY KILLED DURING THE COURSE OF RESEARCH AUTHORIZING TYPES OF TAKE OTHER THAN PERMANENT REMOVAL.

TABLE 10
SUMMARY OF PERMITS FOR PERMANENT REMOVAL FROM THE WILD - PINNIPEDS
AS OF March 31, 1984

SPECIES	******** PERMITS ********			********** NUMBER OF ANIMALS **********					
	ISSUED	EXPIRED	CURRENT	REQUESTED	AUTHORIZED	REPLACEMENTS	AUTHORIZATION EXPIRED	TAKEN (1)	TAKE REMAINING
ARCTOCEPHALINE FUR SEALS	1	1	0	2	2	0	2	0	0
BAIKAL SEAL	1	1	0	4	4	0	0	4	0
BEARDED SEAL	7	4	3	630	630	0	153	175	310
CALIFORNIA SEA LION	73	70	3	869	855	13	128	303	476
CASPIAN SEAL	1	1	0	2	2	0	2	0	0
CRABEATER SEAL	5	3	2	3,288	3,288	0	177	277	2,834
GRAY SEAL	4	4	0	26	26	0	10	18	0
HARBOR SEALS	33	27	6	1,606	1,576	0	476	881	341
HARP SEAL, GREENLAND SEAL	1	1	0	40	40	0	20	20	0
HAWAIIAN MONK SEAL	1	0	1	19	19	0	0	1	19
KERGUELEN FUR SEAL	3	1	2	151	151	0	6	0	145
LARGHA SEAL, SPOTTED SEAL	5	3	2	820	820	0	128	111	600
LEOPARD SEAL	7	4	3	696	696	0	38	76	582
NORTHERN ELEPHANT SEAL	3	1	2	160	160	0	3	24	134
NORTHERN FUR SEAL	2	1	1	20	20	0	0	10	10
NORTHERN SEA LION, STELLER SEA LION	7	3	4	780	780	0	106	325	351
RIBBON SEAL	7	4	3	630	630	0	256	66	308
RINGED SEAL	9	5	4	1,318	1,318	0	440	269	610
ROSS SEAL	6	4	2	289	289	0	28	3	258
SOUTH AMERICAN SEA LION	3	3	0	12	12	0	4	8	0
SOUTHERN ELEPHANT SEAL	4	2	2	153	153	0	8	0	145
UNSPECIFIED MARINE MAMMALS	1	1	0	0	15	0	11	4	0
UNSPECIFIED PINNIPEDS	2	1	1	12	32	3	15	0	20
WALRUS	1	1	0	200	200	0	20	180	0
WEDDELL SEAL	8	5	3	671	671	0	73	60	538
TOTAL NUMBER OF ANIMALS:				12,398	12,389	16	2,104	2,815	7,681

(1) ANIMALS TAKEN INCLUDE THOSE INADVERTENTLY KILLED DURING THE COURSE OF RESEARCH AUTHORIZING TYPES OF TAKE OTHER THAN PERMANENT REMOVAL.

Table 11: MASS STRANDINGS OF WHALES AND DOLPHINS IN THE UNITED STATES FROM 1974-1983 (by State)

Compiled by the Marine Mammal Events Program
(A cooperative program of the Smithsonian Institution
and The Cousteau Society)

Common Name	State	Date	Number Stranded
Stejneger's Beaked whale	Alaska	07-17-75	3
Stejneger's Beaked whale	Alaska	07-28-80	3
Short-finned pilot whale	California	11-18-77	7+
Short-finned pilot whale	California	09-11-79	3
Pygmy killer whale	Florida	02-15-76	5
Pygmy killer whale	Florida	04-18-76	5
Pygmy killer whale	Florida	01-08-80	3
Pygmy killer whale	Florida	07-10-83	3
Pygmy killer whale	Florida	03-20-83	4
Short-finned pilot whale	Florida	02-06-77	140
Short-finned pilot whale	Florida	08-01-79	3
Short-finned pilot whale	Florida	03-19-80	4
Risso's dolphin	Florida	03-08-80	3
Risso's dolphin	Florida	01-28-82	4
Fraser's dolphin	Florida	11-24-81	8
Sperm whale	Florida	11-22-80	11
False killer whale	Florida	07-25-76	30
Spinner dolphin	Florida	07-13-79	29+
Rough-toothed dolphin	Florida	11-74	15
Rough-toothed dolphin	Florida	12-13-80	6
Clymene dolphin	Florida	03-21-83	4
Clymene dolphin	Florida	07-06-83	17
Spotted dolphin	Florida	03-20-83	4
Short-finned pilot whale	Georgia	02-06-77	15
Rough-toothed dolphin	Hawaii	06-76	22
Atlantic white-sided dolphin	Maine	09-06-74	150
Atlantic white-sided dolphin	Maine	08-29-81	50
Common dolphin	Massachusetts	01-03-82	8
Long-finned pilot whale	Massachusetts	12-06-81	18
Long-finned pilot whale	Massachusetts	11-16-82	66
Risso's dolphin	Massachusetts	11-18-79	3
Atlantic white-sided dolphin	Massachusetts	10-08-77	8
Atlantic white-sided dolphin	Massachusetts	12-06-81	4
Atlantic white-sided dolphin	Massachusetts	03-12-82	11
Atlantic white-sided dolphin	Massachusetts	12-16-83	3
Pygmy sperm whale	Massachusetts	12-25-82	2+
Spotted dolphin	Massachusetts	09-13-79	3+
Spotted dolphin	Massachusetts	11-04-79	3+
Short-finned pilot whale	New Jersey	05-18-76	4
Pygmy sperm whale	North Carolina	02-08-80	4
Sperm whale	Oregon	06-16-79	41
Long-finned pilot whale	Rhode Island	12-22-83	11
Pygmy killer whale	Texas	12-01-83	3
Rough-toothed dolphin	Virginia	10-12-76	13

Table 12

INTERNATIONAL WHALING COMMISSION CATCH LIMITS: 1973-1983[1]

	SOUTHERN HEMISPHERE						NORTH PACIFIC							NORTH ATLANTIC				TOTAL COMMERCIAL QUOTAS	Other[7]	TOTAL
	Fin	Minke	Sei	Sperm (M)	Sperm (F)	Bryde's	Fin	Minke	Sei & Bryde's	Sei	Bryde's	Sperm (M)	Sperm (F)	Fin	Minke	Sei	Sperm			
1973/74 1973 Mtg	1,450[2]	5,000[2]	4,500[2]	8,000	5,000	0	550	.....	3,000	...	.....	6,000	4,000	...	.....	...	.....	37,500	8,173	45,673
1974/75 1974 Mtg	1,000[2]	7,000[2]	4,000[2]	8,000	5,000	0	300	.....	2,000	...	.....	6,000	4,000	...	.....	...	.....	37,300	5,173	42,473
1975/76 1975 Mtg	220[2]	6,810	2,230	5,870	4,870	0	0	.....	.....	0	1,363	5,200	3,100	365	2,550	...	.....	32,578	1,358	33,936
1976/77 1976 Mtg	0	8,900	1,863	3,894	897	0	0	541	.....	0	1,000	4,320	2,880	455	2,483	132	685	28,050		28,050
1977/78 1977 Mtg	0	5,690	771	4,538	1,370	0	0	400	.....	0	524	5,105	1,339	459	2,555	84	685	23,520		23,520
1978/79 1978 Mtg	0	6,221	0	3,820	1,055	0	0	400	.....	0	454	3,800	0	455	2,552	84	685	19,526		19,526
1979/80 1979 Mtg	0	8,102	0	...580...		264	0	1,361	.....	0	479	1,350	0	604	2,543	100	273	15,656		15,656
1980/81 1980 Mtg	0	7,072	0	...300...		866[3]	0	1,361	.....	0	529	890	0	701	2,554	100	130	14,523		14,523
1981/82 1981 Mtg	0	8,102	0	....0....		866[3]	0	1,361	.....	0	526	0	0	561	2,554	100	0	14,070 (13,448)		14,070[8]
1982/83 1982 Mtg	0	7,072	0	....0....		165[4]	0	1,361	.....	0	546	400[5]	0	293	2,434[6]	100	0	12,371		12,371
1983/84 1983 Mtg	0	6,655	0	....0....		165[4]	0	421[9]	.....	0	536	--[10]	0	287	1,226[11]	100	0	9,390		9,390

1/ Catch limits are for the Southern Hemisphere pelagic season (November of the year of the meeting through April of the following year) and all coastal seasons of the year following the meeting. The Commission applies quotas to coastal seasons in the year whaling begins. Therefore, e.g., the column labelled "1980/81" reports quotas for the 1980/81 Southern Hemisphere pelagic season and the 1981 coastal seasons, all of which were established at the 1980 IWC meeting.

2/ Catch limit covering Antarctic catch only (south of 40° latitude).

3/ Of this figure, 622 whales could not be taken legally by member countries due to the factory ship moratorium and/or the Indian Ocean Sanctuary.

4/ Available to be taken from the Peruvian stock in a six-month period starting in November but counted for the season of the following year.

5/ The Commission also agreed to a 1982 coastal season catch limit of 450. Both catch limits include an allowable bycatch of up to 11.5% females.

6/ Although the Commission adopted no catch limit for the Northeastern stock, Norway limited catches to 1,690 as though the IWC had established this limit. The number has therefore been reflected in the totals.

7/ Whales taken by IWC members but not included in the catch limits.

8/ The figure in parentheses takes into account the reduction discussed in footnote 3 as well as catch limits totalling 151 North Atlantic fin whales for 1982 that were for stocks that had not been exploited since 1971.

9/ The catch limits for the Sea of Japan-Yellow Sea-East China Sea stock is zero but footnoted in the Schedule to read, "provided that the remainder from the previous block quota of 3,634 for the years 1980-1984, inclusive, may be taken in the years 1984 and 1985."

10/ The 1984 catch limit, if any, will be set at the 1984 Annual Meeting.

11/ Includes 300 whales from the West Greenland stock, some of which may be taken by aboriginal subsistence whaling operations in Greenland.

Table 13 - Estimated Abundance of Bottlenose Dolphins in Southeastern U.S. Waters

Area	Estimated Abundance	Source
U.S. Atlantic		
1. Continental Shelf N of Cape Hatteras	8,603 (± 4307, 95% CI)	CETAP 1983
2. Indian/Banana Rivers, FL	[a] 211	NMFS/SEFC
3. Merrit Island, FL, offshore to 1000 m	665	Fritts et. al., 1983
U.S. Gulf of Mexico		
1. Charlotte Harbor, FL		
2. Charlotte Harbor to Crystal River, FL	505	Odell and Reynolds 1980
3. Naples, FL, Offshore to 200 m	2,021	Fritts et. al., 1983
4. Sarasota Bay, FL	105	Wells et. al., 1980
5. Appalachicola/St. Joseph Bays, FL	[a] 48	NMFS/SEFC
6. Mississippi, Chandeleur, Brenton	1,342	Leatherwood and Platter, 1975
6a. Mississippi Sound	[a] 114	NMFS/SEFC
7. Marsh Island, LA., Offshore to 1000 m	2,292	Fritts et. al., 1983
7a. Atchafalaya Bay, LA	897	Leatherwood et. al., 1978

Table 13 - continued

Area	Estimated Abundance	Source
8. Aransas/Copano/San Antonio	[a] 131	NMFS/SEFC
9. Matagorda Bay, TX	318	Barham et. al., 1979
10. Corpus Christi Bay TX	109	NMFS/SEFC
11. Laguna Madre, TX	[a] 100	NMFS/SEFC
12. Brownsville, TX., Offshore to 1000 m	2,292	Fritts et. al., 1983
U.S. Caribbean Sea		
1. U.S. Virgin Islands	49	NMFS/SEFC
U.S. Pacific		
1. San Diego County, to 100 M	240	NMFS/SWFC

[a] Estimated resident stock size

Table 14

DEPARTMENT OF COMMERCE
Marine Mammal Protection Act (MMPA) Authorizations
and Other Marine Mammal Funding FY 1983-1984
(in thousands of dollars)

MMPA	Authorization	FY 1984 Appropriation	FY 1985 Base	FY 1985 Request
	fy 1983 - 8 million fy 1984 - 8.8 million fy 1985 -			
Resource Information		2,615	3,172	2,515
Information Analysis and Dissemination		891	897	897
Species Managment		1,349	1,424	1,424
Enforcement		1,226	1,256	1,256
Total		6,081	6,749	6,074
ESA (Endangered Species Act)	1983 - 3.5 million 1984 - 3.5 million 1985 - 3.5 million			
Resource Information		2,659	3,063	2,540
Information Analysis and Dissemination		178	179	179
Species Management		22	23	23
Enforcement		230	235	235
Total		3,089	3,500	2,977

Prepared for MMPA Reauthorization Hearings March 1984

Northern fur seal pup on San Miguel Island, California.
Photo by Dana J. Seagars, NMFS, Southeast Region.