



Marine Mammal Protection Act of 1972

Annual Report 1980/81

June 1981

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
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Marine Mammal Protection Act of 1972 Annual Report

April 1, 1980, to March 31, 1981

U.S. DEPARTMENT OF COMMERCE

Malcolm Baldrige, Secretary

National Oceanic and Atmospheric Administration

James P. Walsh, Acting Administrator

National Marine Fisheries Service

Terry L. Leitzell, Assistant Administrator for Fisheries



THE SECRETARY OF COMMERCE
Washington, D.C. 20230

JUN 5 1981

President of the Senate
Speaker of the House of Representatives

Dear Sirs:

Enclosed is the Annual Report of the Department of Commerce concerning administration of the Marine Mammal Protection Act of 1972 for the period of April 1, 1980 through March 31, 1981, 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 concerning these marine mammals.

Sincerely,

Malcolm Baldrige
Secretary of Commerce

Enclosure

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Painting of humpback whale on front cover and painting of minke whale and calf on back cover by Larry Foster.

INTRODUCTION

The marine mammals that are familiar to us today, the dolphins, whales, seals and sea lions, are descendants of a group of mammals that left land for a life in the sea more than 50 million years ago. These warmblooded, air-breathing animals give birth to live young and nourish them with milk. Some marine mammal populations are healthy and stable; others, especially those of the great whales, have not recovered from previous years of intense exploitation.

Over the years, many groups in the United States, both public and private, have promoted the conservation of marine mammals. Passage of the Marine Mammal Protection Act of 1972 (the Act or MMPA) committed this nation to continuing long-term management and research programs to conserve and protect these animals. The Act imposed a moratorium on taking and importing marine mammals or their products, with exceptions, in the United States. The Act applies also to persons subject to U.S. jurisdiction on the high seas. In 1976, the Magnuson Fishery Conservation and Management Act (FCMA) expanded U.S. control of marine mammals to include the 200-mile fishery conservation zone (FCZ).

The Act gave responsibility and authority for oceanic marine mammals to the Secretary of Commerce since the National Oceanic and Atmospheric Administration (NOAA) operates in the Department of Commerce (DOC). The National Marine Fisheries Service (NMFS), under NOAA, is responsible for the order Cetacea (whales and porpoises) and the suborder Pinnipedia (seals and sea lions), except walruses. The Act

gave the Department of the Interior (DOI) responsibility for dugongs, manatees, polar bears, walruses, and sea otters. The moratorium does not apply to mammals already managed under international agreements, such as the northern fur seal. The Act allows the take of marine mammals under permit for scientific research, public display, and incidentally in commercial fishing operations. The Act provides for native take of marine mammals in the North Pacific Ocean and Arctic Ocean, waivers of the moratorium, and for the return of management to the States. Economic hardship and commercial fishing exemption provisions in the Act have expired.

The NMFS makes decisions on requests for waiving the moratorium, issues permits, carries out research programs, enforces provisions of the Act, publishes rules and regulations to manage marine mammals, cooperates with the States, participates in international activities and agreements, and maintains a close working relationship with the Marine Mammal Commission and its Committee of Scientific Advisors which were established by the Act.

Marine mammal research programs take place at 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 carried out at NMFS regional offices in Gloucester, Mass.; St. Petersburg, Fla.; Seattle, Wash.; Terminal Island, Calif.; and Juneau, Alaska.

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

SUMMARY

1980-81 Program

The Act noted that for many marine mammals, there was not enough information to protect or manage wisely their populations. Since 1972, NMFS has directed its research and management programs toward a better understanding of all marine mammal populations under its jurisdiction. Along with these programs, NMFS has pursued its mandate to protect marine mammals through international as well as domestic organizations.

One of the immediate goals of the Act was to reduce the numbers of marine mammals killed or injured in the course of commercial fishing operations. The mortality of porpoise* in the yellowfin tuna purse seine fishery was especially high in the years preceding passage of the Act. Porpoise mortality in this fishery, however, has steadily declined since 1972. The incidental take of porpoise by the tuna purse seine fishery in 1980 was about 4.5 percent (15,000) of the mortality that occurred in 1972 (about 350,000). Government actions, including gear research and development and regulations, encouragement from the public, and the cooperation of the tuna fishermen made this dramatic change possible.

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

After publishing a draft and a final environmental impact statement (DEIS and FEIS) and after public review and a formal hearing before an Administrative Law Judge, NMFS published new regulations on October 31, 1980, which affect the incidental take of porpoise in the tuna purse seine fishery over the next five years. From 1981 through 1985, a maximum of 20,500 porpoise will be allowed to be taken each year. A 5-year permit based on the new regulations was granted to the American Tunaboat Association.

At the International Whaling Commission's (IWC) 1979 annual meeting, a quota was set for the 1980 hunt of bowhead whales by Alaska natives of 18 whales landed or 26 struck, whichever happened first. The total take for 1980 of 16 whales landed and 18 struck and lost exceeded the quota. The taking of a whale during the fall hunt was documented as being in violation of the closed season and the case has been passed to the Justice Department.

Research on the endangered bowhead whale continued during 1980 at the National Marine Mammal Laboratory, Northwest and Alaska Fisheries Center. Scientists counted bowheads from a whale census camp near Barrow, Alaska as the whales migrated past the Alaska Eskimo whaling villages. Analyses of data collected in 1979 and 1980 indicate that 2,264 whales is the best estimate of the bowhead population.

The incidental take of marine mammals in any commercial fishery requires a permit. Both United States and foreign fishing fleets must apply for and receive a permit before taking is allowed. Before a permit can be issued, the Secretary of Commerce must determine whether or not the incidental taking will disadvantage the affected species and stocks and whether or not the taking will reduce the species or stock below their optimum sustainable population (OSP). Japan incidentally takes Dall's porpoise in its salmon gillnet fishery inside the U.S. fishery conservation zone. In 1978, the United States amended the North Pacific Fisheries Act of 1954 to implement a 3 year exemption from incidental take permit requirements. A Memorandum of Understanding was signed by the United States and Japan to conduct joint research to determine the effect of the Japanese salmon fishery on marine mammals, especially the Dall's porpoise, taken in the fishery. This 3-year exemption expires in June 1981. NMFS has issued a draft environmental impact statement on the Incidental Take of Dall Porpoise in the Japanese Salmon Fishery which contains two

alternatives; allow the Japanese to continue to take marine mammals by granting a permit or extending the permit exemption, or not allow the incidental take to continue, thereby ending the Japanese salmon fishery within the U.S. FCZ.

Permits also are necessary for taking or importing/exporting marine mammals for public display or scientific research. Using a computer-based management information system for permit data allows NMFS to track individual animals taken under the Act which are permanently removed from the wild, aid in the review of permit applications, decrease the reporting burden of permit holders and simplify and enhance replies to inquiries. In place of taking animals from the wild for public display and scientific research, NMFS encourages the use of rehabilitated beached or stranded animals. Most regions have developed and are assisting in operating a Marine Mammal Stranding Network. According to the records of the Scientific Event Alert Network, Smithsonian Institution, Washington, D.C., which publishes a monthly report and maintains a central computer file, the most frequently stranded species in 1979 were the bottlenose dolphin, harbor porpoise, and dwarf and pygmy sperm whales.

NMFS has awarded contracts to two States to study marine mammals and fishery interactions. In California, the goal of the study is to identify areas of conflict between fisheries operations and marine mammal populations and to estimate economic loss to the fisheries due to loss of catch and gear as the result of interference by marine mammals. In Washington, the interactions involve primarily coastal pinnipeds (seals and sea lions) and salmon fisheries. The number of complaints of damage to gear, fish loss, and perceived direct competition for salmon resources have increased since passage of the Act.

On October 14, 1980, Canada, Japan, the U.S.S.R., and the United States signed a protocol which will extend the Interim Convention on Conservation of North Pacific Fur Seals until 1984. The harvest of northern fur seals on the Pribilof Islands, Alaska is carried out by the United States under the provisions of the Interim Convention. The U.S. Senate must ratify the protocol before the extension becomes effective.

The provisions of the Act are enforced by NMFS through its law enforcement personnel. Most violations of the Act involve illegally importing marine mammals parts or products. A major effort was launched in 1980 to stop the illegal trade of wildlife and plants and a task force has been formed which includes the Departments of Commerce, Treasury, Agriculture, and Interior in each major port of entry.

According to the Marine Mammal Commission's 1980 Annual Report, 17 Federal Agencies conduct or support research related to the conservation and protection of marine mammals. NMFS reviews and coordinates with other agencies many of these programs. One of the largest programs reviewed by NMFS concerns the proposed actions of the Bureau of Land Management on activities and events associated with exploration and development of offshore oil and gas resources which may affect marine mammals.

PART I - ADMINISTRATION

Permits for Scientific Research and Public Display of Marine Mammals

The Act allows marine mammals to be used for scientific research and public display. This use, however, is controlled by permit, Letter of Agreement, or other specific authorization. The primary objective of the permit system is to ensure that the removal of animals from the wild will not harm the populations or the ecosystems they inhabit. Permit applications are subject to review by the Marine Mammal Commission and the public. Notices of permit applications, issuances, and modifications appear in the Federal Register. During this reporting period, 57 applications were considered. Of these, 30 have been resolved. There were 16 scientific research permits issued and 18 public display permits issued. There were 80 modifications, amendments, or authorizations to permits. In addition, NMFS monitored 249 permits with current valid authorizations for take or related activities.

NMFS encourages the use of rehabilitated beached or stranded animals instead of taking additional animals from the wild, especially in the case of California sea lions, which are frequently available. Currently, if a permit applicant requests a California sea lion, a beached or stranded animal must be used if a suitable one is available.

Letters of Agreement

Letters of Agreement have proved an effective way to ensure that live marine mammals not covered by permit are provided the same level of care and maintenance as required for animals taken under permit. Letters of Agreement may be used only for animals already in captivity and usually involve placing rehabilitated beached or stranded animals into a suitable public display facility. Since no taking is involved, most Agreements are handled at the Regional level.

Management Information System

The computer-based management information system for marine mammal and endangered species permit data (MAMES) has accelerated access to permit records and provides information for statistical and management needs. During 1980, the system was expanded to include animal inventories for facilities holding marine mammals under the Act. Its primary purpose is to track individual animals taken under the Act, aid in the review of permit applications, decrease the reporting burden of permit report holders, and simplify and enhance replies to inquiries.

Facilities holding animals under the authority of the Act are required to submit various reports under each Permit, Agreement, or Letter of Exemption, including annual reports on the health and condition of the marine mammals. Further, each new application for a permit must include a full report on all marine mammals captured and maintained. The new inventory system reduces the reporting requirements to one annual report which covers the condition of all marine mammals maintained. This requirement can be satisfied by updating the computer generated inventory report which is sent to every animal holder in January of each year.

Permit Program Overview

The following tables, generated by MAMES and required by the Act, appear in the Appendix and provide a detailed overview of the permit program:

- (1) common and scientific names of marine mammals requested in scientific research/public display permit applications (table 3);
- (2) summary of permit applications (table 4);
- (3) cetacean take requested in scientific research/public display permit applications (table 5);
- (4) pinniped take requested in scientific research/public display permit applications (table 6);

- (5) cetacean take authorized by scientific research/public display permits (table 7);
- (6) pinniped take authorized by scientific research/public display permits (table 8);
- (7) authorized take for permanent removal from the wild - cetaceans (table 9); and
- (8) authorized take for permanent removal from the wild - pinnipeds (table 10).

Marine Mammal Care and Maintenance

The Animal and Plant Health Inspection Service (APHIS), Department of Agriculture, is responsible under the Animal Welfare Act (AWA) for the humane handling, care, treatment, and transportation of marine mammals. Standards developed by APHIS are incorporated as conditions to all permits issued by NMFS, both foreign and domestic, that involve captive marine mammals. A Cooperative Agreement by APHIS, Fish and Wildlife Service, and NMFS ensures that standards are applied uniformly to all marine mammals in captivity; provides appropriate, consistent guidance to persons responsible for the marine mammals; and ensures that all responsibilities of the agencies relative to the humane handling, care, treatment and transportation of marine mammals are met.

Tanners and Agents for Native Handicrafts

Marine mammals can be taken by any Eskimo, Aleut, or Indian who dwells on the coast of the North Pacific Ocean or the Arctic Ocean if the purpose is to create and sell authentic native crafts and clothing. Traditional native handicrafts include weaving, carving, stitching, lacing, beading, drawing, and painting. To produce these articles, the Act permits the services of a tanner to process hides. Tanners

and agents must apply for and receive Certificates of Registration in order to possess or handle marine mammal parts and products. Ten tanners and 22 agents hold current valid certificates.

Marine Mammal Stranding Network

NMFS has encouraged each of its regions to develop and assist in operating a Marine Mammal Stranding Network. The Regional Networks include individuals and organizations cooperating with a scientific director and a NMFS coordinator. Authorized members of a network 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. Records of these strandings are forwarded to the Scientific Event Alert Network (SEAN), Smithsonian Institution, Washington, D.C. which publishes a monthly report and maintains a central computer file.

Investigation of both live and dead stranded marine mammals provides information on the food habits, incidence of disease, and reproduction biology of many coastal species. The systematic collection of these data contributes to a baseline source of information which can be used to monitor changes in coastal marine ecosystems.

In 1979, 279 cetaceans were examined by the Regional Networks. Twenty-two species were involved; the most frequently found were bottlenose dolphins, harbor porpoises, and dwarf and pygmy sperm whales. The numbers of reported stranded marine animals are related to the frequency of visitors, the frequency of patrolling public and private coastal areas, and accessibility of coastal areas. This explains the large number of reports received from the East and Gulf coasts.

An epidemic of viral pneumonia in harbor seals discovered in December 1979 was intensively studied during 1980. The disease has been found in 600 seals from Rockland, Maine to Cape Cod Bay, Mass. The causal virus is related to the Newcastle disease virus (a major disease in poultry and other birds), but studies indicate that it does not cause serious disease in other species of mammals.

Permits for Incidental Take of Marine Mammals during Commercial Fishing Operations

A general permit system established in 1974 under the MMPA authorizes the incidental taking of marine mammals by domestic fishermen during commercial fishing operations. The FCMA amended the MMPA to include the waters of the 200-mile fishery conservation zone. Since 1977, general permits have been issued to foreign fishing corporations holding a Governing Fishery Agreement with the United States under the FCMA.

On April 2, 1980, a Notice was published in the Federal Register that applications had been received from Douglas Chipman and from the Pacific Coast Federation of Fishermen's Association for General Permits under Categories 1, 3, 4 and 5. A 30-day review period on these applications began April 14, 1980, with release of "A Report Based on the Workshop on Stock Assessment and Incidental Take of Marine Mammals Involved in Commercial Fishing Operations" (Workshop Report). During the review period, the 1979 general permit and certificates of inclusion were extended until new general permits could be issued. This interim period ended on December 31, 1980, when new general permits to take marine mammals incidental to commercial fishing operations were issued to the PCFFA. The permit will expire December 31, 1981. The application of Douglas Chipman was incorporated into the larger permit. It has been determined, based on the Workshop Report, that the take of animals authorized, 1,300 phocid seals, 1,140 otarid seals and 40 cetaceans, will not adversely impact or disadvantage the affected species or stocks. No take of animals is authorized from species where the population numbers are unknown.

In 1980, general permits also were issued to seven foreign fishing corporations for a total incidental take of 437 marine mammals. In 1981, nine applications have been received and eight issued authorizing a total take of 354 marine mammals. See tables 1 and 2 for a list of domestic and foreign general permits issued for 1980 and 1981 (other than for Category 2).

On December 3, 1980, the Assistant Administrator for Fisheries authorized the Regional Directors to adopt, where appropriate, procedures to both simplify the requirements for obtaining certificates of inclusion in the domestic

fisheries and to increase the potential for obtaining data on the incidental catch of marine mammals. Such procedures could result in simplified applications and reports and reduced fees for certificate of inclusion holders. The Northwest Region has implemented a program to increase the number of fishermen who obtain certificates of inclusion. Press releases have been sent to the media notifying fishermen that the \$10 fee has been waived. Certificate applications were sent out with State fishing license renewal notices in Washington and were sent to all 1980 license holders in Oregon. Tribes and fishing associations have been asked to encourage fishermen to obtain Certificates and submit reports on any incidental involvement of marine mammals in their fishing operations.

State/Federal Contracts - Marine Mammals

Washington

Marine Mammal/fishing interactions in the Northwest Region primarily involve coastal pinnipeds (seals and sea lions) and salmon fisheries. Since passage of the MMPA, pinnipeds in Washington and Oregon have been reported in greater numbers and further upstream in rivers. The number of complaints of damage to gear, fish loss, and perceived direct competition for salmon resources have increased. The NMFS has funded a project by the State of Washington to study marine mammal fishery interactions on the Columbia River and adjacent waters. The State of Oregon is supplying logistical support to the program.

This study will evaluate the extent of interactions between marine mammals and commercial and recreational fisheries, continue efforts to monitor marine mammal populations along portions of the coasts of Oregon and Washington, and investigate certain biological characteristics of these populations.

California

The Southwest Region and Southwest Fisheries Center have extended, for one year, a contract with the California Department of Fish and Game to survey and assess the involvement of marine mammals in established commercial and recreational fisheries in California. Areas of conflict between fisheries operations and marine mammal populations will be identified and an estimate of the economic loss to the fisheries due to depredation of catch and loss of gear will be made.

Results from the first year of the survey indicate that there are five fisheries in which significant loss of fish and/or damage to gear occurs: gill/trammel net fisheries, commercial salmon trolling, Pacific herring net fishery, squid fishery, and the anchovy/mackerel round-haul net fisheries. Marine mammals are taken incidentally in all these fisheries either by entanglement in gear or by fishermen trying to protect their gear and catch from depredation. The contractor is investigating the extent of this take and will discuss in a final report the impacts to the marine mammal population involved.

Completion of these two studies will allow NMFS to manage more wisely marine mammal populations of the Pacific Coast and provide a better information base to the State/Federal Program in the event the States apply for the resumption of marine mammal management authority.

International Programs

Antarctic Marine Living Resources

The Convention on the Conservation of Marine Living Resources of Antarctica was concluded in Canberra, Australia during April-May 1980. The Convention was open to signature from August 1 to December 31, 1980. The United States signed the Convention and the Department of State presented it to the Senate for advice and consent on December 1, 1980. The purpose of the Convention is to protect the Antarctic ecosystem and all marine living resources not protected under existing international agreements.

The Consultative Parties to the Antarctic Treaty are discussing the administration of Antarctic minerals with environmental protection as a major component of the prospective regime.

Inter-American Tropical Tuna Commission (IATTC)

The international tuna/porpoise program approved by the Commission in 1977 was reviewed at the annual meeting in October 1980 in Washington, D.C. A report was made on the status of the Commission's efforts to place observers on tuna vessels operating in the eastern tropical Pacific. Although coverage of 103 trips was planned in 1980, only 65 were covered before the end of the year. Trips were completed on vessels from Costa Rica, Panama, New Zealand, Venezuela, and the United States. There has been no coverage of Mexican vessels to date. An agreement between the IATTC and the Mexican Government has been developed and is awaiting approval by Mexican legal authorities.

Consistent with the Commission's objective to avoid the needless or careless killing of dolphins, the scientific staff presented guidelines found through its own research and the experience of the international fleet to be significant in reducing porpoise mortality. These guidelines were recommended to the commissioners who agreed to advise their governments of these techniques and gear designs for consideration and possible adoption.

International North Pacific Fisheries Commission (INPFC)

United States and Japanese scientists, in 1980, completed the third and final year of cooperative marine mammal research provided for under the terms of a 1978 Memorandum of Understanding included as part of the International Convention for the High Seas Fisheries of the North Pacific Ocean. The 1980 research included a dedicated research vessel provided by Japan which fished with the salmon fleets. For the first time, U.S. marine mammal scientists on board the motherships were able to make observations from catcher boats.

At the Annual Meeting of INPFC in November 1980, the Ad Hoc Committee on Marine Mammals heard reports that observations on board the dedicated vessel and the catcher boats showed higher rates of incidental capture of Dall porpoise than those recorded by the Japanese catcher vessels. The Japanese delegation indicated that this discrepancy arose from a misunderstanding of the definition of "take" by Japanese fishermen. The Japanese stated that instructions to their fishermen will be more explicit in the future.

North Pacific Fur Seal Commission (NPFSC)

At its 23rd meeting in Moscow, U.S.S.R., in April 1980, the Commission noted that data presented by Canada and the United States indicate that the size of the Pribilof fur seal herd may have stabilized at a lower level since the end of the female harvest in 1968, the beginning of intensive commercial fishing in the Bering Sea, the entanglement problem and other environmental changes which may have occurred in this area. The total estimated size of the fur seal population is approximately 1.7 million, while the

Pribilof population is 1.25 million animals, including 326,000 newborn pups.

In 1980, the Soviet Union harvested 5,500 seals on Robben and the Commander Islands. The United States had a commercial harvest of 24,278 male seals on St. Paul Island.

On October 14, the Governments of Canada, Japan, the U.S.S.R., and the United States signed a protocol which will extend the Interim Convention on Conservation of North Pacific Fur Seals until 1984. The protocol contains minor modifications which recognize the extended fisheries jurisdictions of the parties. In the United States, the Senate must ratify the protocol before it can be implemented.

The NPFSC was established by the Interim Convention on Conservation of North Pacific Fur Seals of 1957. This treaty, among Canada, Japan, the United States and the Soviet Union, prohibits pelagic sealing, provides for coordinated research programs, and arranges for a sharing of skins from seals harvested on land among Party Governments.

United States - Mexico Discussions

United States and Mexican scientists met during 1980 to share scientific information and to prepare for continued joint studies of gray whales in calving areas in Mexico.

U.S.-U.S.S.R. Marine Mammal Project, Environmental Protection Agreement

The project promotes joint research by U.S. and Soviet scientists on the biology, ecology, and population dynamics of marine mammals of interest to both countries. During March 1980, a project leaders' meeting was held in Seattle, Wash. to review the previous 18-month period of joint work and to plan future research.

Two U.S. scientists participated in a joint study of the Baikal seal during May-June 1980. The work concentrated on the physiology and acoustics of this species. The U.S. scientists traveled from the Academy of Sciences

Limnological laboratory at Lystvyanka, U.S.S.R. to the central part of Lake Baikal where the breeding concentrations are located.

Two Soviet scientists participated in a research cruise aboard the NOAA ship DAVID STARR JORDAN from mid-June to mid-July 1980. The distribution of marine mammals, primarily cetaceans, in the coastal waters off southern California and Baja California were studied during the cruise. Cetacean sighting methodology used by the SWFC was demonstrated.

Two Soviet scientists participated in joint work on seals, sea lions and sea otters in Alaska and California during July and August 1980. They met with U.S. scientists in Fairbanks, Alaska and Seattle, Wash. during their visit to discuss future cooperation in marine mammal research. Highlighting the field research were studies of northern sea lions in the area of Kodiak, Alaska and sea otter observations at Piedras Blancas Calif.

Three U.S. scientists participated in a research cruise aboard the Soviet research vessel "Razyatchi" in the Bering and Chukchi Seas for two weeks during September 1980. One U.S. scientist returned with the vessel to the Chukchi Sea in October for further work. An extension of the range of gray whales into the East Siberian Sea was recorded. Large numbers of bowhead whales again were seen (as in 1979) in the western Chukchi Sea, with an estimated 200+ whales sighted between Capes Vankarem and Schmidt. Biopsy samples of skin and blubber were obtained from bowhead whales for karyotype and electrophoretic analyses.

International Whaling Commission (IWC)

The 32nd annual meeting of the IWC was held at Brighton, England, July 21-26, 1980. The United States has supported a moratorium on commercial whaling at every meeting of the IWC since 1972. That year, the total commercial catch limit was about 46,000 whales; this year it is down to 14,523. Although the complete commercial moratorium did not pass at the 1980 meeting, the United States did achieve a total ban on taking killer whales by factory ships. This action protects the killer whale from pelagic whaling operations that might turn to hunting smaller whales because of tightened restrictions on hunting larger ones. The

Government of Spain agreed to stop hunting sperm whales, and the IWC agreed to ban the use of the cold (non-explosive) harpoon in taking large whales which will assure a more humane catch by reducing the time between harpooning and death.

The United States will continue to press for a moratorium on commercial whaling, a hallmark of U.S. policy in the IWC, and until this is achieved, reduced quotas and strict conformity with IWC regulations by all whaling countries. See table 11 in the Appendix for a listing of the commercial quotas set by the 32nd meeting. The 1981 annual meeting of the IWC will be held in Brighton from July 20-25.

Legal Actions

Friends of Animals, et al. v. Roe, et al., Civ. No. 80-2870 (U.S. District Court, D.C.); American Tunaboat Association, et al. v. Klutznick, et al. (Civ. No. 80-1952-G(I)) (U.S. District Court, S.D. California).

Both actions challenge the Administrator's (NOAA) Final Decision in the 1980 tuna/porpoise rulemaking. In that Final Decision, the Administrator published a 20,500 overall porpoise quota for each year from 1981 through 1985. Complaints and answers have been filed in both cases.

Law Enforcement

The Law Enforcement Division, NMFS, is responsible for enforcing the provisions of the Act. Most violations of the Act involve the alleged illegal importation of marine mammal parts or products. In the Southwest Region (California), most law enforcement activities concern the incidental take of porpoise by tuna fishermen.

During the 1980/81 reporting period, NMFS investigated 265 alleged violations of the Act. Of these, 201 actual violations were documented; 108 cases were closed by assessing civil penalties and/or forfeiting seized

contraband, 64 cases were closed as unfounded or for lack of evidence; about 200 cases are pending (including cases from previous years). Six cases were closed through successful criminal prosecution.

Contracts for enforcement of the Act were renegotiated with the States of California, Oregon, and Washington. NMFS works closely with State law enforcement agencies to improve their effectiveness in achieving compliance with the Act. State officials also monitor marine mammal capture operations carried out under permits issued by NMFS and inspect marine mammal holding facilities.

Two Morehead City, N.C. men were convicted in February 1981 for illegally taking, transporting, possessing and landing an Atlantic bottlenose dolphin off Radio Island, N.C. in December 1980. Identical sentences given to the two men included; a one-year suspended prison term, two years of supervised probation, a \$500 fine plus a \$400 assessment for attorney and court costs and 40 hours of work at the NMFS laboratory in Beaufort, N.C.

Three Taiwanese fishermen were found guilty in Federal Court in Tampa, Fla. on December 11, 1980, for taking Atlantic bottlenose dolphins, which they had filleted and eaten. The three were crewmen aboard the shrimp trawler Carib 602 which was operating near the Tortugas when the dolphins were taken during May and June. The three crewmen were arrested September 2, 1980, when they attempted to leave St. Petersburg. Although the vessel was registered as a U.S. fishing vessel, the entire crew were Taiwanese nationals except for the captain who is a U.S. citizen. The three men were fined and deported in January 1981.

On February 13, 1981, an Anchorage, Alaska Federal Judge fined the operators and owners of a Ketchikan fishing boat \$15,000 after ruling that a crew member had committed the "heedless and senseless act" of shooting at a humpback whale. This is the largest fine levied in a case involving marine mammals since passage of the Act.

A Canadian citizen and his corporation was assessed a \$10,000 fine for the illegal importation of dolphins while enroute from Mexico to Canada. The defense stated that, under the Act, an in-transit shipment through the United States was not an importation. The Administrative Law Judge upheld the Agency's definition of importation which includes in-transit shipments through the U.S. even though such shipments may not be considered an importation under Customs Laws.

During 1980, a major effort to stop the illegal trade of wildlife and plants was launched by forming task forces from the Departments of Commerce, Treasury, Agriculture, and Interior in each major port of entry. These groups were briefed by attorneys from the Department of Justice, Land and Natural Resources Division, and local U.S. Attorney's offices. NMFS trains its own personnel as well as law enforcement personnel from other Federal agencies and the States in the enforcement of the MMPA. Also, training seminars are held for U.S. Customs Inspections and Control personnel at ports of entry.

Interagency Review and Coordination

Seventeen Federal departments and agencies conduct or support research related to the conservation and protection of marine mammals. (Annual Report of the Marine Mammal Commission, Calendar Year 1980). The Bureau of Land Management (BLM), NMFS and the Fish and Wildlife Service have the largest programs. NMFS reviews and coordinates many of these programs with the other agencies involved in marine mammal programs.

Marine Mammals and the Effects of Outer Continental Shelf Oil and Gas Development

NMFS reviews proposed actions and advises the BLM on activities and events associated with the exploration and development of offshore oil and gas resources which may directly or indirectly affect marine mammals and the ecosystem of which they are a part. BLM is responsible under the Outer Continental Shelf (OCS) land act for predicting, mitigating, and detecting the adverse effects of OCS oil and gas development. NMFS advises the BLM of measures that are needed to assure that the proposed actions will not place marine mammals at a disadvantage.

NMFS and BLM held the first of several planned regional coordinating meetings in Seattle, Wash. (November 1980). The responsibilities of each agency and its marine mammal research programs were discussed.

Wildlife Law Enforcement Coordinating Committee

The Coordinating Committee, which includes NMFS, FWS, APHIS, Customs Service, and Department of Justice concluded a Memorandum of Understanding (MOU) (January 1980) to establish a Wildlife Task Force for California. The Task Force will be located in the Customs Office at Terminal Island, Calif. and will focus on wildlife importation violations in the Los Angeles and San Diego areas where many major wildlife cases have occurred.

A draft MOU on forfeiture of seized wildlife has been circulated by the Committee for public comment. Signing of the MOU is expected in 1981.

Steering Group - Marine Mammal/Fish and Shellfish Interactions

Marine mammals and fisheries compete for some of the same fish and shellfish resources. In 1979, a Steering Group of representatives from NMFS, the North Pacific Fishery Management Council and the Marine Mammal Commission was formed to develop a plan to manage cooperatively the goals of the MMPA and the FCMA.

NMFS has prepared a report on a workshop held by this group in Seattle, Wash., May 1980. The report, Ecosystem Simulation Models and Their Applications to Fishery Management, will be published in 1981.

PART II - MANAGEMENT AND RESEARCH PROGRAMS

Cetaceans

Porpoise and the Tuna Purse Seine Fishery

Management

Most tuna harvested in the eastern tropical Pacific Ocean (ETP) involves setting large purse seine nets on schools of tuna. These schools are often found in close association with marine mammals such as porpoise. Fishermen use the knowledge of this relationship between certain porpoise stocks and yellowfin tuna to guide fishing strategy by setting their nets around schools of porpoise to catch the tuna. During this operation, incidental taking of porpoise can occur which results in death or serious injury.

This incidental taking under the MMPA requires permits and accompanying regulations. Before permits may be issued, two operative tests must be satisfied. First, any incidental taking must not be to the disadvantage of the affected species and stocks and must not reduce affected species and stocks below their optimum sustainable populations (OSP). Second, the "immediate goal" test requires that "in any event it shall be the immediate goal that the incidental kill or incidental serious injury of marine mammals permitted in the course of commercial fishing operations be reduced to insignificant levels approaching a zero mortality and serious injury rate." Once the "disadvantage" test is satisfied, the "immediate goal" test requires that mortality be lowered to levels that are achievable through the use of the best practicable technology so that commercial fishing can continue. Once the interests of the marine mammals are assured, the interests of the industry can be served.

A major consideration is that, except for scientific research, the MMPA does not allow any take permits to be issued if the subject species or stock is designated as depleted. In this regard, the Administrator of NOAA has concluded as a matter of law that a species or stock is

depleted when the number of individuals of the species or stock is below its OSP.

The previous general permit governing the incidental taking of porpoise in the ETP was issued on December 27, 1977; regulations were published on December 23, 1977. These regulations reduced allowable annual porpoise mortality by establishing decreasing individual stock quotas; gear regulations; porpoise rescue procedures; and observer requirements. The general permit expired December 31, 1980.

In addition, there is an accidental take enforcement policy that allows for limited accidental taking of eastern spinner dolphin, a depleted stock, and other prohibited stocks, because such limited taking was determined not to be to the stocks' disadvantage.

On February 15, 1980, proposed regulatory amendments were published that included statements required by the MMPA and that would amend regulations published on December 23, 1977. A Draft Environmental Impact Statement was filed with the Environmental Protection Agency on February 5, 1980, and made available to other Federal agencies and the general public for comment on February 15, 1980.

A formal hearing provided the opportunity for public review of the proposed regulations and all other relevant information. The hearing was conducted by Administrative Law Judge, Hugh J. Dolan in San Diego, Calif., from March 31 through April 5, 1980, and in Washington, D.C., on April 14, 15, and 18, and May 19, 1980.

The hearing focused on the following issues: (a) estimates of existing levels of the species and stocks of the marine mammals involved in purse seining yellowfin tuna; (b) the expected impact of the proposed regulations on the OSP levels of the species and stocks involved; (c) the economic feasibility of implementing the proposed regulations, (d) the technological feasibility of implementing the proposed regulations; and (e) the impact of implementing the proposed regulations on the tuna stocks.

Table 1. Total incidental porpoise mortality and serious injury for U.S. and Non-U.S. vessels, 1971-1979
(NMFS, 1979, updated)

<u>Year</u>	<u>U.S. Vessels</u>	<u>Non-U.S. Vessels</u>	<u>Total</u>
1971	246,213	15,715	261,928
1972	368,600	55,078	423,678
1973	206,697	58,276	264,973
1974	147,437	27,245	174,682
1975	166,645	27,812	194,457
1976	108,740 (quota - 78,000)	19,482	128,222
1977	25,452 (quota - 62,429)	25,901	51,353
1978	19,366 (quota-51,945)	11,147	30,513
1979	17,938 (quota-41,610)	6,837	24,775
1980	15,000 (quota-31,150)		

Following public review and comment and the formal hearing before an ALJ, the Administrator's final decision was announced October 21, 1980 and published October 31, 1980. It was reprinted in the FEIS - Proposed Regulations and Conditions for the Issuance of a General Permit Governing the Taking of Marine Mammals Associated with Tuna Purse Seining Operations, November 1980. The amended regulations established conditions for the issuance of a general permit to allow the taking of a maximum of 20,500 porpoises as apportioned into individual stock quotas for each of the five years 1981-1985. This mortality limit will not be to the disadvantage of the affected porpoise stocks, and no intentional taking of depleted or other prohibited species/stocks will be permitted. NMFS will monitor the affected fishery and take appropriate action to reduce the maximum number of porpoises that are taken incidentally consistent with the economic and the technological feasibility of industry compliance with the reductions. The NMFS will also complete a reassessment of the status of the porpoise stocks in the ETP by the end of 1984. The regulations add to or modify gear and procedural requirements, clarify observer responsibilities, and modify importation documents.

A general permit was issued to the American Tunaboat Association, December 1, 1980. Proposed amendments to the regulations modifying stock quotas within the 20,500 animals per year unit were published in the Federal Register, January 7, 1981.

The yellowfin tuna/porpoise management program is led by NMFS personnel in the Southwest Region. During 1980, 99 tuna/porpoise observer cruises were completed aboard U.S. flag tuna vessels. Of these, 55 were cooperative cruises with the Inter-American Tropical Tuna Commission and 44 were trips sponsored by the NMFS.

Porpoise safety gear inspections were made on 66 vessels in San Diego, Calif. and Panama City, Panama to ensure conformance with U.S. marine mammal regulations. Tuna seiner operator workshops were held for 13 skippers during the year. Since tuna/porpoise regulations remained unchanged from the previous year, 138 operators who held 1979 Certificates of Inclusion were not required to attend in 1980.

Porpoise mortality for the U.S. tuna purse seine fleet declined further in 1980. By the first week in December 1980, less than 15,000 animals were estimated to have been killed during the course of fishing operations. This compares favorably to a total of about 18,500 in 1979, about 24,000 in 1977 and about 157,000 in 1975.

Research

In 1980, the Southwest Fisheries Center continued to assess the population size and biology of dolphins involved in the tuna purse seine fishery of the eastern tropical Pacific. Research activities focused on six major areas: (1) analysis of research vessel and aerial survey data for population estimation; (2) collection of additional data on dolphin distribution; (3) execution of experiments to evaluate aerial photographs for measuring dolphins; (4) development of methods for better age determination; (5) investigation of new methods for stock identification; and (6) continuation of development of a satellite-linked tag.

Data collected in 1979 and early 1980 on research vessel and aerial surveys were analyzed. A description of methodology used in the analyses and estimates of stock sizes were completed and included in the Final Environmental Impact Statement, Proposed Regulations and Conditions for the Issuance of a General Permit Governing the Taking of Marine Mammals Associated with Tuna Seining Operations, November 1980.

NMFS participated on two research vessel cruises of the Eastern Pacific Ocean Climate Survey to obtain more information on the distribution and habitat of dolphins in the eastern tropical Pacific. The cruises were conducted in an area where data on dolphin distribution are sparse. Principal objectives were to extend our understanding about changes in dolphin distribution with season and about differences in distribution of species as related to oceanographic features.

Aerial photographic techniques for counting and identifying dolphins have been under investigation since 1974. An aerial photographic experiment was designed and executed jointly by the NMFS and the Inter-American Tropical Tuna Commission in November and December 1980 off the coast of Mexico. The goal of the experiment was to obtain photographs of schools of high resolution and clarity for estimating lengths of individual animals. The data obtained are being evaluated.

Development of a method of aging dolphins by mapping fine layers in teeth sections continued in 1980. Sufficient progress has been made to test the method on a large collection of specimens.

Investigations in new methods for stock identification began with studies on the feasibility of using parasite faunas, chromosome morphology, and multi-variate analysis of morphometric data to separate stocks. These studies are expected to be completed in 1981.

A design flaw delayed the development of a satellite-linked tag in 1980. The flaw was discovered in a prototype tag that was tested on a wild dolphin. The test revealed that the surface-exposure time of the tag's antenna was insufficient for linking with a NIMBUS satellite. Modifications to correct the problem are being evaluated.

Bottlenose Dolphin

Management

The popularity of the bottlenose dolphin, especially for public display, prompted the Marine Mammal Commission to recommend 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. The Southeast Center is currently surveying the populations in the affected areas and future quotas will be based on the results of these studies.

Annual Quotas

Mississippi Sound - 35

Indian/Banana River Complex (Florida) - 7

Texas Coast - Corpus Cristi/Matagordo Bay - 17

West Coast of Florida (between Crystal River and Charlotte Harbor) - 6

Research

After evaluating several experimental marking techniques, the Southeast Fisheries Center selected cryogenic freeze branding as the method to use to identify individual bottlenose dolphins. During November 1980, sixty-two dolphins were captured, branded and released in the Indian River, Fla. Through systematic resighting, information is collected on composition, social dynamics, and movements of selected dolphins in this area.

Aerial survey technology developed to estimate bottlenose dolphin densities was applied to five specific locations; Aransas and San Antonio Bays, Tex; Indian and Banana Rivers, Fla; Apalachicola and St. Joseph Sound, Fla; Mississippi Sound, Miss; and Charlotte Harbor, Fla. Population estimates of these areas are pending.

Bowhead Whales

Management

Hunting bowhead whales by Alaska natives has been regulated by the International Whaling Commission since 1977 when it set a quota for whales struck and landed during the 1978 season. The MMPA allows for a native subsistence harvest of whales if the taking is for subsistence purposes and not accomplished in a wasteful manner. The MMPA allows for regulating the subsistence take of a species declared depleted as defined by the Act.

The IWC decided to regulate the hunt because of concern for the population size of the bowheads and the expansion of the hunt. The current population estimate is 2,264 bowheads in the Bering, Chukchi, and Beaufort Seas. The 1980 quota set by the IWC was 18 whales landed or 26 struck. A landed whale is counted as a strike, and whales that are struck but lost are counted as strikes. The quota was reached by Alaska natives when 15 bowhead whales had been landed and 11 had been struck but lost. The quota was exceeded when 5 bowheads were struck at Barrow during May and one whale was landed and two struck and lost at Kaktovik during the autumn hunt. The total take for 1980 was 16 landed and 18 struck and lost for a total of 34. The overall quota set by the IWC for 1981, 1982, and 1983 is 45 landed or 65 struck, with no more than 17 landed during any one year.

During the 1980 hunting season, NMFS placed enforcement personnel beginning at Pt. Hope, Alaska, April 14 and ending at Barrow, Alaska, June 6. Taking of a whale by natives at Kaktovik in the fall was documented as being in violation of the closed season. The case was passed to the Justice Department for prosecution.

Research

The bowhead whale research program at the National Marine Mammal Laboratory, Northwest and Alaska Fisheries Center, has been designed to (1) provide a reliable estimate of the western Arctic-Bering Sea bowhead whale population size, (2) provide an estimate of annual recruitment, (3) determine

distribution and migration routes, and; (4) determine the effect of the Alaska native harvest on this population. The spring northward migration was delayed by almost a month in 1980 due to an ice blockage in the Bering Strait. As a result, some bowheads entered Norton Sound, an unusual occurrence, and one bowhead was landed (the first time on record) by hunters at Shaktoolik. The migration past the NMFS whale census camps near Barrow occurred over a two-week period, a much shorter period than normal, because of the ice blockage in the Bering Sea. Based on observations made in spring 1978, the population of bowhead whales migrating past Alaska Eskimo whaling villages ranged from 1,783 to 2,865 whales, with 2,264 bowheads considered the best estimate. Analyses of data collected in 1979 and 1980 indicate that the 1978 estimate remains the best estimate of this population size. Census research is directed primarily at determining relative abundance or change in the population.

Studies of bowheads were made during research in Amundsen Gulf and eastern Beaufort Sea, (Canada) to gain better information on annual recruitment (births). A cruise aboard the Soviet vessel Razyatchi in the western Chukchi Sea in the autumn provided additional information on distribution.

An analysis of life history and harvest data using an age-structure model suggests that this population may have declined over the period 1970-1980. Further evaluation of the limited data available and collection of additional life history information will be needed to determine the reliability of this model.

Biological work on aging bowheads continues through biochemical analysis of eyes. Other aging techniques, based on analyses of baleen plates and wax ear plugs, have not proven reliable. A biopsy dart developed and successfully tested in 1979 was used again in 1980 to collect additional tissue samples for karyotyping and electrophoretic work to determine the biochemical and genetic heterogeneity of the population. Stored fatty acids in the blubber layer and in prey are being analyzed for their relation to possible prey items and time of feeding.

Stomach contents from the five whales taken in the fall of 1979 were recovered and identified. The dominant food item was copepods, with euphausiids (krill) being next in importance; together they provided 91.2 to 99.7 percent of the stomach contents of all five whales. The stomach contents indicate that a feeding dive probably involves swimming obliquely from surface to bottom and back, feeding

the entire time. These are the only data available on the feeding of bowhead whales in the central portion of the Beaufort Sea.

Dall's Porpoise

Management

Marine mammals, primarily the Dall's porpoise, are taken during commercial gillnet operations by Japanese fishing vessels, within and outside the U.S. fishery conservation zone (FCZ) in the North Pacific and Bering Sea. A three-year exemption from the incidental take permit requirements of the MMPA granted the Japanese salmon fishery in the North Pacific Ocean, and implemented by 1978 amendments to the North Pacific Fisheries Act of 1954, will expire in June 1981. NMFS published a draft environmental impact statement, Incidental Take of Dall's Porpoise in the Japanese Salmon Fishery in January 1981. The DEIS examines the impacts of the following alternatives: (1) allow the Japanese fishery to continue to take marine mammals within waters under U.S. jurisdiction (proposed action), through either (a) granting an incidental take permit under the MMPA, or (b) recommending legislative action to extend the permit exemption; and (2) not allow this incidental take to continue, thereby ending the Japanese salmon fishery within the U.S. FCZ, by taking no action before June 1981. The Japanese have applied for a general take permit for 1981 which, if granted, would allow 5,500 animals to be taken in the FCZ.

Research

Scientists from the National Marine Mammal Laboratory, and the Japanese Fisheries Agency completed a 3-year cooperative research program to evaluate the effect on the Dall's porpoise by the Japanese high-seas salmon gillnet fishery. Not enough data existed previously to determine current population size, annual incidental take levels, or the reproductive and natural mortality rates of the affected populations. Data from the three years of study are being analyzed to determine the possible impact of the mothership

and land-based fisheries on the Dall's porpoise. Estimates of abundance of the Dall's porpoise in the northern North Pacific and Bering Sea range from 580,000 to 2.3 million with 920,000 considered the best estimate. Preliminary analysis of the life history data is complicated because of possible seasonal and aerial biases in the data and by lack of return of all porpoise to the mothership for sampling as a result of a misunderstanding of the cooperative agreement requirements by the Japanese fishermen.

During the 1979 and 1980 seasons, the Fisheries Agency of Japan chartered a vessel dedicated to marine mammal and salmon research. The vessel was engaged in tagging to provide information on movements of the porpoise and in studies of entanglement while working with the mothership fleet using commercial gear and techniques. One marine mammalogist boarded each of the four salmon motherships to collect biological samples and data from all porpoises returned to the motherships by the catcherboats. This information will be used to determine the life history of Dall's porpoise. The scientists observed entanglements aboard catcherboats of each of the mothership fleets this year. U.S. scientists aboard three Japanese research vessels collected systematic sighting data for use in estimating the abundance of Dall's porpoise.

Gray Whale

Management

In 1978, the IWC removed the gray whale from protected status when they determined the population was approaching precommercial exploitation levels. Interest in whale watching along the California coast has paralleled the increased abundance of gray whales. Harassment by whale watchers continues to have the potential for adverse impact to individual whales as they migrate along the California coast.

Guidelines for gray whale watching were included in an educational brochure published by the Southwest Region in cooperation with the American Cetacean Society in 1979.

Failure to observe the guidelines may be interpreted as harassment which is illegal under the MMPA. Copies of the brochure are available from the NMFS, Southwest Region, 300 South Ferry Street, Terminal Island, California 90731.

Research

During the second year of a proposed 5-year cooperative research program with the Mexican Department of Fisheries, the NMML studied the gray whales most important calving area which is at Laguna Ojo de Liebre, Baja California. Data on distribution, numbers, and behavior of both adults and calves were obtained. In addition, an extensive aerial census of gray whales was made throughout their winter range along the west coast of Baja California.

Annual shore censuses of southward migrating gray whales have been made for the past 13 years from points near Monterey, California. A series of aerial transects and ground-truth studies were made during the 1979/80 southward migration to determine what proportion of whales pass out of sight of the shore observers and to identify and measure observer bias from shore. Gray whale censuses also were made at Cape Sarichef, Unimak Pass, Alaska. These censuses indicate that the gray whale population now numbers about 16,000.

Humpback Whale

Management

About 60 percent (650) of the entire North Pacific population of the humpback whale winter in the coastal waters off the main islands of Hawaii. To protect the humpback from whale watchers, NMFS issued a Notice of Interpretation (NOI) on January 4, 1979 for the "taking by harassment" of humpback whales in the Hawaiian Islands which continued to be in effect for the 1980-81 season. Portions of the NOI were summarized in a brochure distributed by the Southwest Region to private boaters, whale watchers,

airlines serving Maui, and the general public. NMFS 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 acquisition of a NMFS patrol vessel. The number of complaints of alleged harassment of humpback whales declined in the 1979-1980 season compared to previous years. This appears to be due to a better understanding by whale watchers and the public about activities which harass humpback whales.

Research

A census of humpback whales and other marine mammals was made in the Gulf of Alaska from June through August 1980 by the National Marine Mammal Laboratory. Small local concentrations of humpbacks are located around the Barren Islands northeast of Kodiak, around Middleton Islands, in Prince William Sound, in Yakutat Bay, and in the Alexander Archipelago of southeastern Alaska.

The NMML has established a central computerized index for identification photographs of humpback whales. Photographs of the flukes of humpback whales are being contributed by biologists working in many parts of the North Pacific. Matching photographs enables the movements of individual whales to be plotted and has revealed the migration routes between summer grounds in Alaska and winter grounds around Hawaii and off Mexico.

Pinniped Programs

Hawaiian Monk Seal

Management

The Hawaiian monk seal was declared depleted in July 1976 under the MMPA and listed as endangered under the Endangered Species Act in November 1976. The Marine Mammal Commission recommended in December 1976 that a portion of the Hawaiian monk seal's range be considered for designation as critical habitat. NMFS issued a draft environmental impact statement in February 1980 which evaluated critical habitat alternatives for the Hawaiian monk seal. Public comments have been received and are under review. A recovery team was appointed by the Southwest Regional Director in 1980 to prepare a Draft Recovery Plan for the Hawaiian monk seal. The Plan is scheduled for completion by summer, 1981.

Research

A long-term cooperative study of Hawaiian monk seal biology was started in 1976 by biologists at the Northwest and Alaska Fisheries Center; the National Bird and Mammal Laboratory, FWS; and Marine Mammal Commission contract researchers. Surveys were made of the status and trends of the population, and a population and behavioral study was made at Laysan Island, Hawaii in 1977, 1978, 1979 and 1980. Recent censuses indicate most island populations have decreased 50 percent, on the average, since the late 1950's. Monk seal populations at Kure, Midway, and Pearl Islands and Hermes Reef declined 70 to 90 percent in the same period. Lisianski and Laysan Island populations have declined 40 to 60 percent, while monk seal populations at French Frigate Shoals and Necker Island increased during the same period.

A comprehensive analysis of the data from the 1977-1980 studies will be made in 1981. The results will be used by the Recovery Team, the Marine Mammal Commission and NMFS to

identify the actions needed to encourage recovery and monitor the status of the monk seal population. By the end of 1980, the Recovery Team had met several times to develop a Recovery Plan. A workshop was held at the Southwest Fisheries Center in April 1980 to develop a "die-off" response plan. In 1978, at least 50 monk seals died on Laysan Island, possibly from ciguatoxin poisoning.

Threats to the monk seal include disturbance and harassment by humans, commercial fishing, disease, shark predation, and man-made toxic substances. The Honolulu Laboratory of the Southwest Fisheries Center directs monk seal studies for NMFS.

Channel Islands National Park, California

Management

The National Parks and Recreation Act (the Act) established the Channel Islands National Park in March 1980. San Miguel, one of the islands included in the park, is home to six species of pinnipeds. The Act instructed the Departments of the Interior and Commerce to cooperate in the development of a Natural Resources Study to consider marine mammals in the park planning process. The NMFS Southwest Region and the Southwest Fisheries Center are developing management and research plans for pinniped populations within the Park in cooperation with the National Park Service, the State of California, and the Office of Coastal Zone Management. This cooperative effort will continue for a minimum ten-year period (1980-1990) as mandated by the Act.

Research

The National Marine Mammal Laboratory is continuing a long term research program on San Miguel Island. This program was initiated in 1968 when a northern fur seal breeding colony was discovered on the island. The program monitors the growth of the northern fur seal colony, investigates the relationships between northern fur seals and the five other

pinniped species that use the island, and studies the biology and behavior of all the pinniped species on the Island. In 1981, the Southwest Fisheries Center will implement the population assessment phase of its coastal marine mammal program to collect information on the current status of pinniped populations on the Channel Islands. The California sea lion, northern sea lion, northern fur seal, Guadalupe fur seal, harbor seal, and northern elephant seal, haul out on the island. The northern fur seal population is expanding; in 1980, about 1,500 pups were born. The California sea lion population appears to have stabilized with between 7,000 and 9,000 pups born each year. California sea lions and northern fur seals compete for rookery space, because both species pup and breed at the same time at Adams Cove and Castle rock. Studies of competition for space between the two species suggest that the less abundant northern fur seal is displacing the California seal lion. In 1980, studies of allocation of food resources among California sea lions, northern fur seals, harbor seals, and northern elephant seals were initiated to describe the food habits and further characterize the role in that ecosystem of these pinniped species.

Pribilof Islands Program - Northern Fur Seal

Management

Each year the U.S. government employs Aleut residents to harvest male fur seals on the Pribilof Islands. The fur seal is polygynous with one harem bull to an average of 40 female seals. Therefore, the surplus males in excess of the reproductive needs of the population are harvested when they are between the ages of 2 and 6 years. These sub-adult males haul out in groups away from the females, pups, and harem bulls in the breeding areas. This separation makes it possible to herd only bachelor males inland for harvesting without disturbing the rookeries. The number of seals harvested each year is regulated by establishing size and season limits. In 1980, a total of 24,278 male fur seals, primarily 3 and 4 year olds, were harvested during the 25-day season on St. Paul Island from June 27 to August 1.

The moratorium on commercial harvest on St. George Island that began in 1973 continued in 1980 although a subsistence harvest was allowed on one haul-out area. A total of 350 seals were taken for local consumption during the twice a week subsistence harvest from July 8 to August 21.

Aside from managing the northern fur seal herds on the Pribilof Islands, the NMFS is responsible (under the Fur Seal Act of 1966) for administration of the islands. Federal involvement is gradually diminishing on the Pribilof Islands as the Aleut people assume greater responsibility for municipal functions.

NMFS published the final environmental impact statement (FEIS) in September 1980, Interim Convention on Conservation of North Pacific Fur Seals. The FEIS recommended extending the Interim Convention for four years. This alternative was determined by NMFS to provide the best available protection to the northern fur seal throughout its range.

Research

Biological information collected by the National Marine Mammal Laboratory for fur seals of the Pribilof Islands of St. Paul and St. George in 1980 included the determination of age composition of fur seals harvested, the number of adult males on the rookeries and hauling grounds and the number of pups and seals older than pups that died on the rookeries and adjacent beaches. The number of pups born on St. Paul Island in 1980 was also estimated. This work was reported in NWAFRC Processed Report 81-2--Fur Seal Investigations, 1980. Population data, collection procedures, and management of the northern fur seal of the Pribilof Islands were summarized in NWAFRC Processed Report 80-11. With the cooperation of Japan, Canada, and the USSR, a comprehensive summary of land and pelagic data was compiled and published in 1980 as NOAA Technical Memoranda. These three volumes included: Volume 1, Land Data of the United States and Soviet Union; Volume 2, Eastern Pacific Pelagic Data of the United States and Canada; and Volume 3, Western Pacific Pelagic Data of the Soviet Union and Japan.

The Pelagic Research Task completed its analysis of Pelagic fur seal data collected by the United States and Canada during 1958-74. The report includes distribution and migration, life table and biomass estimates, pregnancy rates and migration, maturity and age at first reproduction, and the feeding habits of the northern fur seal.

A three-year field study on estrus in fur seals and a three-year study on movements of juvenile males were completed. Additional data were collected on diving behavior of female fur seals for inclusion in a manuscript on "Feeding and diving behavior in three species of eared seals". A study on age bias in the shearing-sampling procedure was complete, and results were made available to other fur seal tasks for use in modifying the technique. A study on the seasonal distribution of fur seal births by sex was also completed; the results will be published by the NMML.

The NMML investigated an epidemic of neurologic disease in adult female fur seals migrating off the coast of Oregon and Washington. Two of three comatose seals studied were restored to normal health. A mother-pup pair was studied for energy requirements of nursing females, and the life history of a parasite found in their bloodstreams was examined before they were released.

Progress was made on determining the life cycle and detrimental effects of respiratory mites on fur seals and on the transmission of filariid worms in fur seals. Microbiology and cell mediated immunity were studied. Two scientific papers on parasites and treatment of parasites were published.

East Coast Marine Mammal Research

Cetaceans and Pinnipeds

Relatively little is known about the status or trends of the more than 30 species of cetaceans and pinnipeds that inhabit the waters along the East Coast of the United States. Congress appropriated monies in 1980 to facilitate the development of a research and management program for East Coast cetaceans. The first workshop was organized by the New England Aquarium in 1979.

To continue the program, NMFS convened a Workshop on Humpback Whales in the Western North Atlantic (November 1980). The report of the workshop will be used to develop a research/management plan for humpback whales in the Northwestern Atlantic. NMFS also initiated a program to assess and monitor the status of endangered whales, harbor

porpoises, and other cetaceans along the northeast coast of the United States. NMFS has awarded contracts to study harbor seals, humpback whales and right whales, develop an observer training course, a shipboard observer manual, publish a humpback whale fluke identification catalogue, and extract data from whaling logbooks and journals.

PART III - 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, and those managed by the International Whaling Commission or which have been imported under a scientific research or public display permit.

Because we are separated from marine mammals by the sea, the study of these animals in their natural habitat has been difficult. Although, several alternatives to first hand observation are used to study marine mammals. One method has been to study the remains of animals that have been killed or stranded. New methods of statistical analysis allow scientists to estimate the past abundance and distribution of some groups and to compare these to present day populations. 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 Mediterranean 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

ST California sea lion
(Zalophus californianus)

ST Northern (Stellar) sea lion
(Eumetopias jubatus)

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

STX Guadalupe fur seal
(Arctocephalus townsendi)

Family: Phocidae

STL Larga seal
(Phoca largha)

S Harbor (Common) seal
(Phoca vitulina)

ST Ringed seal
(Phoca [=pusa] hispida)

Harp seal
(Pagophilus groenlandicus)

ST Ribbon seal
(Phoca [=Histriophoca] fasciata)

~~ST Walrus~~

Family: Phocidae (con't)

(F) STX Gray seal
(Halichoerus grypus)

STL Bearded seal
(Erignathus barbatus)

ST Hawaiian monk seal
(Monachus schauinslandi)

Crabeater seal
(Lobodon carcinophagus)

Ross seal
(Ommatophoca rossi)

Leopard seal
(Hydrurga leptonyx)

Weddell seal
(Leptonychotes weddelli)

ST Northern elephant seal
(Mirouga leoniana)

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30

29 18

Order: Cetacea

Suborder: Mysticeti
Family: Eschrichtiidae

Gray whale
(Eschrichtius robustus)

ST I

Family: Balaenopterida

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
(Steno bredanensis)

Bottlenose dolphin
(Tursiops truncatus)

Family: Delphinidae (con't)

Spinner Dolphin
(Stenella longirostris)

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 obliquidens)

Northern right whale dolphin
(Lissodelphis borealis)

Risso's dolphin
(Grampus griseus)

Melon-headed whale
(Peponcephala electra)

Pygmy killer whale
(Feresea attenuata)

3270726
30 STABLE
12 + 18 = 30
43

Family: Delphinidae (con't)

False killer whale
✓ (Pseudorca crassidens) ST

Long-finned pilot whale
✓ (Globicephala melaena) ST

Short-finned pilot whale
✓ (Globicephala macrorhynchus) ST

Killer whale
2 (Orcinus orca) ST

Family: Phocoena

Harbor porpoise
✓ (Phocoena phocoena) ST

Dall's porpoise
(Phocoenoides dallii) ST

Family: Monodontitae

Beluga, belukha, white whale
(Delphinapterus leucas)

~~ST~~ Narwhale
(Monodon monoceros)

Family: Physeteridae

Sperm whale
ST (Physeter catodon)

Pygmy sperm whale
ST (Kogia breviceps)

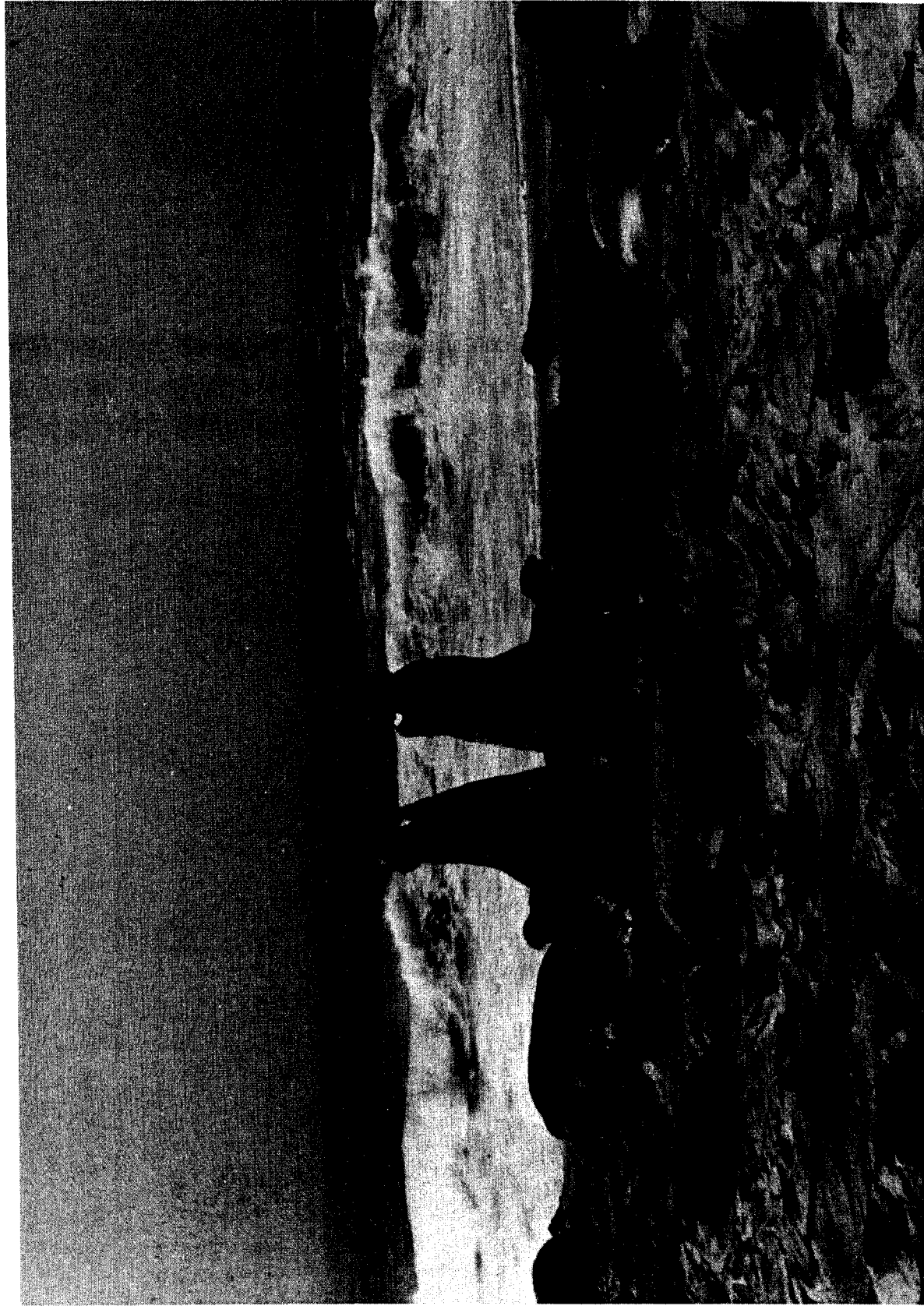
Dwarf sperm whale
ST (Kogia simus)

Family: Ziphiidae

ST Baird's beaked whale
(Berardius bairdii)



32 Total	12	44
29 Studies	10	39
2 Dec	1	3
1 inc	1	2



Elephant seals at San Nicolas Island, Calif. Photo by Douglas Beach, NMFS.

POPULATION ESTIMATES
PINNIPEDIA

Name	Estimated World Total	Comparison of 1/2 Population Data	Arctic Circumpolar	PACIFIC				ATLANTIC				SOUTHERN OCEAN					
				Asia	Alaska	North America	South America	North America	Europe	Africa	South America	New Zealand	Australia	Sub Antarctic	Antarctic		
California sea lions (<i>Zalophus californianus</i>)	110,000	complete				90,000	20,000										
Northern sea lion (<i>Eumetopias jubatus</i>)	232,000 to 262,600	complete				20,000 to 50,000	200,000 to 12,600										
South American sea lion (<i>Otaria flavescens</i>)	273,000	complete					228,000				45,000						
Australian sea lion (<i>Neophoca cinerea</i>)	2,000 to 3,000	complete															2,000 to 3,000
Hooker's (New Zealand) sea lion (<i>Phocartos hookeri</i>)	6,000																6,000
Alaska or Northern fur seal (<i>Callorhinus ursinus</i>)	1,838,000	best					585,000 to 1,250,000	3,000									
Guadalupe fur seal (<i>Arctocephalus townsendi</i>)	1,000	complete						1,000									
Juan Fernandez fur seal (<i>Arctocephalus philippii</i>)	705 to 750	complete															
Galapagos fur seal (<i>Arctocephalus galapagoensis</i>)	1,000 to 5,000	incomplete															1,000 to 5,000

1/All species of pinnipeds are included in the tables because of available data.

POPULATION ESTIMATES
PINNIPEDIA

Name	Estimated World Total	Comparison of Population Data	Arctic Circumpolar	PACIFIC	ATLANTIC	SOUTHERN OCEAN
Family: Otariidae						
South American fur seal (<u>Arctocephalus australis</u>)	346,000	Incomplete		294,000	52,000	
Cape (South Africa) and Australian fur seal (<u>Arctocephalus pusillus</u>)	870,000	Complete			850,000	20,000
New Zealand fur seal (<u>Arctocephalus forsteri</u>)	58,000	Complete				25,000
Antarctic (Kerguelen) fur seal (<u>Arctocephalus gazella</u>)	350,000	Complete				33,000
Subantarctic fur seal (<u>Arctocephalus tropicalis</u>)	122,900	Incomplete			113,000	350,000
						9,900

POPULATION ESTIMATES
PINNIPEDIA

Family: Phocidae		Name		
Estimated World Total	335,000 to 450,000	Incomplete	Comparison of Population Data	
	135,000 to 200,000	200,000 to 250,000	Arctic Circumpolar	
PACIFIC	Asia	15,000	Asia	
	Alaska	10,000	Alaska	
	North America	260,000 to 42,000	North America	
	South America		South America	
	ATLANTIC	North America	20,000 to 48,000	North America
		Europe	30,000 to 51,000	Europe
		Africa		Africa
		South America		South America
		New Zealand		New Zealand
	SOUTHERN OCEAN	Australia		Australia
Sub Antarctic			Sub Antarctic	
Antarctic			Antarctic	
Largha seal (<i>Phoca largha</i>)	380,000 to 450,000	Incomplete	Comparison of Population Data	
Harbor (Common) seal (<i>Phoca vitulina</i>)	399,000	Incomplete	Comparison of Population Data	
Ringed seal (<i>Phoca [pusa] hispida</i>)	6 to 7 million	best estimate 7,000,000	Comparison of Population Data	
Baikal seal (<i>Phoca sibirica</i>)	40,000 to 50,000	complete	Comparison of Population Data	
Caspian seal (<i>Phoca caspica</i>)	500,000 to 600,000	complete	Comparison of Population Data	
Harp seal (<i>Phoca groenlandica</i>)	1,300,000 to 2,300,000	complete	Comparison of Population Data	
Ribbon seal (<i>Phoca [= histriophoca] fasciata</i>)	200,000 to 250,000	complete	Comparison of Population Data	
Gray seal (<i>Halichoerus grypus</i>)	88,000 to 94,000	complete	Comparison of Population Data	
Bearded seal (<i>Erignathus barbatus</i>)	exceeds 500,000	Incomplete	Comparison of Population Data	
Hooded seal (<i>Cystophora cristata</i>)	500,000 to 600,000	complete	Comparison of Population Data	

POPULATION ESTIMATES
PINNIPEDIA

Name	Estimated World Total	Comparison of Population Data	PACIFIC				ATLANTIC				SOUTHERN OCEAN						
			Arctic Circumpolar	Asia	Alaska	North America	South America	North America	Europe	Africa	South America	New Zealand	Australia	Sub Antarctic	Antarctic		
Family Phocidae																	
Mediterranean monk seal																	
(<u>Monachus monachus</u>)	500	best								500							
Caribbean monk seal																	
(<u>Monachus tropicalis</u>)	extinct or near extinct	best								+							
Hawaiian monk seal																	
(<u>Monachus schauinslandi</u>)	500	complete				500											
Southern elephant seal																	
(<u>Mitounga leonina</u>)	600,000	complete															300,000
Northern elephant seal																	
(<u>Mitounga angustirostris</u>)	45,000 to 60,000	best				45,000 to 60,000											
Crabeater seal																	
(<u>Lobodon carcinophagus</u>)	15,000,000	best															15,000,000
Ross seal																	
(<u>Ommatophoca rossii</u>)	220,000	complete															220,000
Leopard seal																	
(<u>Hydrurga leptonyx</u>)	500,000	complete															500,000
Weddell seal																	
(<u>Leptonychotes weddellii</u>)	750,000	complete															750,000

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.

3/ + = A population occurs in this area in addition to numbers estimated from other regions. The numbers are either unknown or the data are not available.

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 accomplish dives of 20 to 30 minutes.

Pinnipeds are tied to the land or a solid place such as the ice pack 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 to the marine environment demonstrated by seals. The ability to cycle the gestation and birth of the pup is known in other species of mammals, 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.

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 inch long, furled external ears. They are able to rotate both the fore and hind flippers which allows them to stand, run, and climb with great agility. In their polygamous (several mates) social structure, a dominant male attempts to breed all females passing through his territory. Many newborn pups are crushed or lose track of their mothers during this time although high pregnancy rates may compensate for many of the pups lost. After about four months on land where birthing, breeding and nursing have taken place, the sea lions and fur seals return to sea. Sea lions and fur seals are found in both cold and tropical latitudes. Their underfur beneath a strong net of guard hairs provides 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 1800's, some species of fur seals were reduced to remnants of their former populations because of the fur traders desire for their pelts because of the dense underfur.

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 although 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 nurse for more than a year; the exact age of weaning is unknown. The females breed about 3 weeks after giving birth; the period of delayed implantation of the fetus is probably 3.5 months. This species adapts well to captivity and is the most commonly 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, hake, sardines, and opeleye fish. Killer whales and sharks prey on California sea lions.

The Mexican and California populations of sea lions number about 45,000 animals each. The Galapagos Island population has stabilized at about 20,000 animals after recovering from sealing operations at the turn of the century. The eastern Pacific populations appear to be approaching the "carrying capacity of the ecosystem" (the number of animals of a species that a habitat can support).

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 otarid; 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 3 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 from males moving about rapidly trying to maintain harems of 10 to 20 cows. 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 become competitive breeders defending harems at 7 to 9 years of age. Harem bulls are active breeders probably for only 3 to 5 years before they retire to the bachelor groups. Northern sea lions have been known to live as long as 23 years. Northern sea lions feed on a wide variety of fish including salmon, capelin, shad, and lampreys. Killer whales frequently prey on sea lions.

Northern sea lions probably are at or near the carrying capacity of their ecosystem. The Alaskan populations are estimated at over 200,000 animals. U.S.S.R. populations are thought to be between 20,000 to 50,000. The British Columbia population is about 5,000; Washington, about 600; Oregon, about 2,000; and California, about 5,000 to 7,000.

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 four island complexes. The largest number congregate on the Pribilof Islands, eastern Bering Sea; lesser numbers at the Commander Islands, Sea of Okhotsk; and the Kuril Islands, western North Pacific. As the females come ashore, they are met by the breeding harem master bulls who attempt to keep a group of females close to them. About two days after coming ashore, the females give birth to a single black pup which weighs about 12 lbs. The pups nurse for about four months and stay together in groups while their mothers are at sea feeding. In October, the seaward migration begins. Most fur seals do not come ashore again during their first 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, pollock, salmon, and squid. Killer whales and sharks prey on adult northern fur seals; northern sea lions prey on fur seal pups.

At a population size of about 1,838,000, this species appears to be at or near the carrying capacity of the ecosystem. There are 585,000 northern fur seals in Soviet waters, more than 3,000 in Southern California waters and 1,250,000 in Alaskan waters and the Bering Sea. Northern fur seal populations were greatly reduced in the latter part of the 19th century by pelagic sealing. In 1911, the total population numbered about 200,000 animals.

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 former population of the Guadalupe fur seal are as high as 200,000 on Guadalupe alone. The estimated length for adult males is about 6.5 ft, 4.5 ft for 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 territories in caves and rocky recesses for their harems.

The small population on Guadalupe Island has survived as a breeding colony largely due to its inaccessible and usually unnoticed rookery sites. The population probably will continue to grow since it appears to be below the ecosystem's carrying capacity.



Hawaiian monk seal with pup at French Frigate Shoals, Hawaii. Photo by Robert DeLong, NMFS.

Family Phocidae

Hair (True) Seals

Hair seals are relatively young in the fossil record and are not as well known as the otarids. 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 hemisphere species is white. A lanugo coat, or birth hair, provides warmth and protection in the first weeks of life. It can be white, gray, or black. Retaining a white coat after birth is an adaptive response to their ice habitat and is thought to protect them from their predators, polar bears, which feed on the young and adults both on ice and at sea in the northern hemisphere. For some species, this predatory pressure is a substantial factor in their reproductive success each year. The general social structure of hair seals is of monogamous (one mate) aggregations with little attempt 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... the weight of the rear part of the body thrown forward gives the animal a rippling effect when moving. Hair seals can balance and lift themselves on their forelimbs, but not while moving.

Largha 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 woolly 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 according to season and location. 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. This species is considered stable in numbers and close to the carrying capacity of the ecosystem. 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 is no harem structure during the breeding season, and 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. The young nurse for 4 to 6 weeks. Harbor seal females mature sexually at 2 to 5 years of age, males between 3 and 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 squid and a variety of fish including herring, smelt, salmon, and cod. Dives to depths of 300 ft and for 23 minutes have been recorded. Harbor seals live up to 40 years. Eagles and foxes prey on the newborn and young; sharks, killer whales, bears, and walruses prey on the older animals.

Harbor seals are considered abundant throughout most of their range and may be close to the carrying capacity of their ecosystems. 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 a preliminary estimate of 3,000 to 7,000 in U.S. Atlantic waters. About 312,000 to 317,000 animals inhabit the Pacific Ocean.

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 the 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 about 143 lbs. The diet of the ringed seal depends on the food available given the ice conditions. From December through February, it feeds on polar cod; in summer, it feeds 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 a group in the White Sea off the Soviet Union, a group in the Norwegian Sea around Jan Mayan Island, and the largest group around Newfoundland along the Labrador Coast and the Gulf of St. Lawrence in Canada. 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 gray spotted 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. Males probably breed with one or a few females. Females mature sexually at about 5 years, males at 6 years. Longevity of 30 years has been documented. Harp seals feed on capelin, polar cod, herring, and many species of crustaceans. Harp seals are maintained successfully in research colonies. Sharks, killer whales, and polar bears are known predators of harp seals.

The total world population is estimated to be between 1.3 and 2.3 million animals. The Norwegian (Jan Mayen Island) and White Sea populations appear to be increasing. The western North Atlantic population which breeds in the Gulf of St. Lawrence and off Newfoundland is estimated from 700,000 animals (other than pups) to 1.5 million.

Harp Seal

Phoca groenlandica

There are three groups in the world population of harp seals including a group in the White Sea off the Soviet Union, a group in the Norwegian Sea around Jan Mayan Island, and the largest group around Newfoundland along the Labrador Coast and the Gulf of St. Lawrence in Canada. 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 gray spotted 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. Males probably breed with one or a few females. Females mature sexually at about 5 years, males at 6 years. Longevity of 30 years has been documented. Harp seals feed on capelin, polar cod, herring, and many species of crustaceans. Harp seals are maintained successfully in research colonies. Sharks, killer whales, and polar bears are known predators of harp seals.

The total world population is estimated to be between 1.3 and 2.3 million animals. The Norwegian (Jan Mayen Island) and White Sea populations appear to be increasing. The western North Atlantic population which breeds in the Gulf of St. Lawrence and off Newfoundland is estimated from 700,000 animals (other than pups) to 1.5 million.

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 200 lbs. Pups are born on the ice in March and early April and average less than 2 ft in length and weigh about 22 lbs. The newborn have a coat of white lanugo hair which is shed within a month of birth. Nursing is estimated at 3 to 4 weeks. Gestation is about 11 months, including delayed implantation. Longevity is between 22 to 26 years. Females mature between 2 to 4 years; males between 3 to 5 years. As the ice pack recedes in spring and summer, ribbon seals probably return to the open sea. They feed on a variety of fishes, 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's the numbers were increasing. A small number is been 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 sub-arctic waters. Three stocks are recognized, western Atlantic (Canada), eastern Atlantic (Iceland and Britain), and an ice breeding population in the Baltic Sea. There is a breeding colony of gray seals near Nantucket Island, Massachusetts. These large pugnacious seals 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. In Britain, the breeding males attempt to hold territories in a polygamous type of social structure. This social behavior is not seen in groups on the ice where they are more monogamous. Pupping in Canadian and Baltic waters occurs mostly in February; in Britain, births are generally in September and October. Adult males reach about 7 ft in length and average 500 lbs in weight; females average 6 ft in length. 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 probably 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. 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, pollack, lamprey, salmon, herring, and other fish.

The world population for this species is between 88,000 and 94,000 animals. Several populations are increasing.

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, Norway, and in the Pacific to Hokkaido, Japan. In U.S. waters, they are found in the Beaufort and Bering sea. Bearded seals recently have been observed residing in the fast ice along the shore where they maintain breathing holes. Their size, their habit of almost exclusively feeding on bottom dwelling invertebrates, and the presence of long bearded whiskers which form a moustache are characteristics they share with walrus. Both sexes are similar in size averaging about 8 ft in length; adult weight fluctuates from 605 lbs in summer to 743 lbs in winter. The pups are about 2.6 ft long at birth and weigh about 95 lbs. Pups triple their weight after nursing only 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 feed on this species. There are some records of bearded seals being kept in captivity, but they are not common in public displays.

The total population 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 third species Monachus monachus, the Mediterranean monk seal, survives in small numbers in separate colonies on the African-Atlantic and European-African Mediterranean coasts. The Hawaiian species is found on Necker Island, French Frigate Shoals, Lisianski Island, Laysan Island, Pearl and Hermes Reef and Kure Atoll, all in the Leeward Islands. They are not known to migrate, but they do move among the islands. They are found scattered along sandy beaches and in the shoreline vegetation. Mating probably 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 which are about 7.6 ft long and weigh about 600 lbs are larger than males. Males average 7 ft in length and weigh about 380 lbs. Not much is known about longevity, but 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 having large extensive scars. The toxic disease ciguatera 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 animals, is endangered and is the subject of a research and management program by a Recovery Team, a requirement of the Endangered Species Act.

Crabeater Seal

Lobodon carcinophaga

The crabeater seal is probably the most populous 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 relatively close to the shoreline of the continent. There are no known migratory movements for this species, and the forming of groups is subject to the advance and retreat of the ice pack. As with the other genera of Antarctic phocids, crabeaters have cusps on each of the premolar and molar teeth in contrast to the cone shaped teeth of other pinnipeds. When the upper and lower teeth are brought together, the row of teeth forms 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, which reach adult size in four months, are born with a light gray lanugo coat. 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. Killer whales and leopard seals prey on crabeater seals.

Crabeater seals are believed to be at the carrying capacity of their Antarctic ecosystem. The population estimate of 15 million animals is higher than for all the other pinniped species combined.

Ross Seal

Ommatophoca rossii

Although there is considerable knowledge on the biology of Antarctic hair seals, the Ross seal remains one of the least understood pinnipeds in the world. This seal prefers the heavy consolidated ice pack where ice breakers or aircraft are the only means of access. Ross seals have large plump bodies with a short wide head that can be pulled into rolls of blubber around the neck. They make cooing and trilling noises as they lift their head and inflate the throat in a "singing" posture. Biological data is based on a few specimens; however, an animal of at least 12 years has been recorded. 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 about 3.5 ft long and weigh about 60 lbs. females mature sexually at 3 to 4 years and males between 2 and 7 years. Ross seals eat mostly cephalopods. They 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 assessed. 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 found as 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. Adult males average about 9 ft in length, but are known to reach 10.5 ft. They average 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 between 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 this species. Leopard seals have been displayed successfully in public display facilities.

This species is probably at the carrying capacity of its ecosystem. It is not hunted 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 are known 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 the seals 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 or dark lanugo coat which is molted about the time they are weaned at six weeks. They grow rapidly from a birth weight of 48 to 55 lbs, to 275 lbs when weaned. Mating takes place in the water near the breathing hole. 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 to 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 known. 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.

The population estimates of 750,000 animals are regarded as conservative due to the difficult access for observers to the animals' preferred habitat, the shore fast ice. 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. The elephant seal is an exception to the general pattern of phocid social organization because the male defends territories on the beach and battles with other males to defend this territory. The females are able to move away from combatant males although 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 that feed on fish below 50 fathoms as well as fish known 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. This species is now considered to be approaching the carrying capacity of its ecosystem. The total population is estimated between 45,000 and 60,000 animals.



Yearling gray whale loafing in kelp off Pt. Loma, Calif.
NMFS photo.

POPULATION ESTIMATES
CETACEA

Name	Estimated World Total	Comparison of Population Data	ARCTIC		PACIFIC					ATLANTIC					SOUTHERN OCEAN			
			Circumpolar		Asia	Alaska	North America	South America	North America	Europe	Africa	South America	New Zealand	Australia	Sub Antarctic	Antarctic		
Suborder: Mysticeti Family: Eschrichtiidae Gray whale (<i>Eschrichtius robustus</i>)	16,000	best			16,000													
Family: Balaenopteridae Minke whale (<i>Balaenoptera acutorostrata</i>)	320,000	incomplete		+ ^{2/}					120,000									200,000
Sei whale (<i>Balaenoptera borealis</i>)	210,000	incomplete			18,000	+	+	+										192,000
Bryde's whale (<i>Balaenoptera edeni</i>)	16,000	incomplete			16,000	+	+	+										+
Fin whale (<i>Balaenoptera physalus</i>)	214,000	complete						34,000						20,000				169,000
Blue whale (<i>Balaenoptera musculus</i>)	11,200	complete						1,700						500	+	+		9,000
Humpback whale (<i>Megaptera novaeangliae</i>)	5,700 to 6,800	incomplete						1,000						1,200 to 2,300				2,500
Family: Balaenidae Right whale (<i>Balaena glacialis</i>)	3,620	complete						220						200	+	+		3,200
Bowhead whale (<i>Balaena mysticetus</i>)	2,200	complete	+		2,200													

POPULATION ESTIMATES
CETACEA

Name	Estimated World Total	Comparison of Population Data	Arctic Circumpolar	PACIFIC	ATLANTIC	SOUTHERN OCEAN
Family: Delphinidae						
Atlantic white-sided dolphin (<u>Lagenorhynchus acutus</u>)	no data	incomplete			North America + Europe + Africa + South America +	New Zealand + Australia + Sub Antarctic + Antarctic +
Pacific white-sided dolphin (<u>Lagenorhynchus obliquidens</u>)	no data	incomplete		+ 30,000 to 50,000		
Northern right whale dolphin (<u>Lissodelphis borealis</u>)	no data	incomplete		+ +		
Southern right whale dolphin (<u>Lissodelphis borealis</u>)	no data	incomplete		+ +		+ +
Risso's dolphin (<u>Grampus griseus</u>)	no data	incomplete		+ + +	North America + Europe +	New Zealand + Australia +
Melon-headed whale (<u>Peponocephala electra</u>)	no data	incomplete		+ +		
Pygmy killer whale (<u>Teressa attenuata</u>)	no data	incomplete		+ + +	North America + Europe +	New Zealand + Australia +
False killer whale (<u>Pseudorca crassidens</u>)	no data	incomplete		+ + +	North America + Europe +	New Zealand + Australia +
Long-finned pilot whale (<u>Globicephala melaleuca</u>)	no data	incomplete		+ + +	North America + Europe +	New Zealand + Australia +
Short-finned pilot whale (<u>Globicephala macrorhynchus</u>)	no data	incomplete		+ + +	North America + Europe +	New Zealand + Australia +
Killer whale (<u>Orcinus orca</u>)	no data	incomplete		+ + +	North America + Europe +	New Zealand + Australia +

POPULATION ESTIMATES
CETACEA

Name	Estimated World Total	Comparison of Population Data	Arctic Circumpolar	PACIFIC				ATLANTIC				SOUTHERN OCEAN				
				Asia	Alaska	North America	South America	North America	Europe	Africa	South America	New Zealand	Australia	Sub Antarctic	Antarctic	
Suborder: Odontoceti Family: Delphinidae Rough-toothed dolphin (<u>Steno bredanensis</u>)	no data	incomplete		+	+	+	+	+	+	+	+					
Bottlenose dolphin (<u>Tursiops truncatus</u>)	no data	incomplete		+	+	3,000 to 10,000	+	+	+	+	+					
Spinner dolphin (<u>Stenella longirostris</u>)	no data	incomplete		+	2 million	+	+	+	+							
Spotted dolphin (<u>Stenella attenuata</u>)	no data	incomplete		+	3.9 million											
Atlantic spotted dolphin (<u>Stenella plagiodon</u>)	no data	incomplete				+	+	+	+							
Striped dolphin (<u>Stenella coeruleoalba</u>)	no data	incomplete		+	248,000	+										
Common dolphin (<u>Delphinus delphis</u>)	no data	incomplete		+	1.5 million	+	+	+	+	+	+	+	+	+	+	+
Fraser's dolphin (<u>Lagenorhynchus hosei</u>)	no data	incomplete			+					+	+					

POPULATION ESTIMATES
CETACEA

Name	Estimated World Total	Comparison of Population Data	Arctic Circumpolar	PACIFIC Asia Alaska North America South America	ATLANTIC North America Europe Africa South America	SOUTHERN OCEAN New Zealand Australia Sub Antarctic Antarctic
Family: Phocoenidae Harbor porpoise (<i>Phocoena phocoena</i>) Dall's porpoise (<i>Phocoenoides dalli</i>)	no data 920,000	incomplete complete		+ + + 920,000	+ +	
Family: Monodontidae Beluga, belukha, white whale (<i>Delphinapterus leucas</i>)	62,000 to 88,000	complete	62,000 to 88,000			
Narwhal (<i>Monodon monoceros</i>)	10,000	incomplete	+	+ + 10,000	+	
Family: Physeteridae Sperm whale (<i>Physeter catodon</i>) Pygmy sperm whale (<i>Kogia breviceps</i>) Dwarf sperm whale (<i>Kogia simus</i>)	732,000 no data no data	complete incomplete incomplete		300,000 + + + + + +	22,000 + + + + + +	410,000 + + +
Family: Ziphiidae Baird's beaked whale (<i>Berardius bairdii</i>)				+ + +		+ + +

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/ + = A population occurs in this area in addition to numbers estimated from other regions. The numbers are either unknown or the data are not available.

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 characters 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. A dorsal fin consisting of only blubber and blood vessels was another new structure not found in other mammals.

The whales bear their young alive, and as air breathers, have adapted to their life at sea. As with other mammals, whales regulate their body temperature above that of 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. Whales produce some of the richest milk of all the mammals which causes a phenomenal growth rate in calves. Cetaceans have the advantage of buoyancy, which contributes to a faster growth rate than most land dwelling animals. A fatty oil is present through 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 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.

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, there are 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 species of baleen whale 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 known animal living or extinct. The accepted record length is 102 feet from 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 as do dolphins or sperm whales. All of the species probably have some form of seasonal migration. 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 in the nutrient rich waters of the higher latitudes to feed and nurse their young.

Family Eschrichtiidae

Gray whale

The only living species in this family is found in the eastern Pacific Ocean and Bering and Chukchi Seas, although many skeletal remnants of the Atlantic form are known from European waters, notably the Baltic, and eastern North America waters. 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.

Many specimens of fossil gray whales are being studied. Most are from California, but some are from other areas around the Pacific basin. They are distinguished from the other two families of baleen whales by their lack of speed and their lack of a streamline body or ponderous bulk. The upper jaws with the 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. This species migrates up to 11,000 miles each way from the Bering and Chukchi Seas to a series of lagoons in Baja California. They stream through Unimak Pass in the Aleutian Island chain and angle across the Gulf of Alaska to travel close to shore along the west coast of California and arrive in the calving and breeding lagoons in December. The migration north is not as structured as the migration south, and the whales travel farther offshore. 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 are thought to bear a calf every 2 or more years. 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 raking through the mud with its stiff rows of baleen. They feed on a wide variety of invertebrates, usually amphipods (small crustaceans such as sand hoppers). They 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.

At an estimated 16,000 animals, the eastern Pacific population of this species is near the carrying capacity of its range. The actual population numbers are uncertain, a problem compounded by the incomplete migrations of younger animals not passing the counting stations.

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 in the southern hemisphere, notably krill. With the exception of the Bryde's whale, the migration of northern and southern populations alternate between high latitudes and tropical temperate waters in each hemisphere which sets up a cycling in their worldwide distribution. In July, August and September, the southern rorquals are in the tropical wintering grounds of southern hemisphere waters and are not in contact with their northern hemisphere counterparts who are feeding in the higher latitude temperate or arctic waters during this time. 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, 5 species, and Megaptera, 1 species. Adults range in size from 30 ft (minke) to over 100 ft (blue).

The species in this family 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 at birth and is weaned at about 6 months. Sexual maturity occurs at about 2 years of age in the southern hemisphere and at 7 to 8 years in the north. Females probably give birth every other year.

This species is currently the only baleen whale taken commercially in the southern hemisphere where its population is estimated at greater than 200,000. The North Atlantic population is about 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 pollack, a species of fish. Sei whales migrate from tropical to high latitudes in both hemispheres. They are similar to the fin whale, but are smaller and 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 between 6 and 12 years and males grow to lengths of about 43 ft and females about 45 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 the maximum sustainable yield level, but not depleted. The total world population is about 210,000 animals.

Bryde's Whale

Balaenoptera edeni

Bryde's whales are found in tropical warm temperate waters in all the oceans. They are similar in size and form to sei whales and are often confused with them. 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 which does not migrate to high latitudes to feed and to suckle its young. It has coarse baleen bristles and it feeds on fish and a variety of planktonic organisms. Bryde's whales are between 43 and 45 ft long as adults; they become sexually mature when they reach about 40 to 41 ft long. In several species, sexual maturity is determined by the size of the animal rather than by age. 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 up to ten.

Although population estimates are being studied, the process is 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 16,000 whales; estimates for other areas have not been developed.

Fin Whale

Balaenoptera physalus

The fin whale is the second largest species of rorqual and has a record length of 82 ft, although they average 60 to 75 ft. The female, as in most baleen whales, is slightly larger than the male. They move in groups of 2 to 5 animals, but aggregations of 50 to 100 are seen within a few square miles. Although their high latitude migrations are not as extensive as other species, fin whales are found in all oceans. The asymmetrical color pattern on the head of fin whales throughout the world is striking because it is consistently white on the right side of the head as well as the belly. This color pattern may be an advantage when the whale attacks a school of fish. The standard marine animal pattern is a darker color on the back and a lighter color on the belly. This species matures sexually between 6 and 12 years. Gestation is 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.

Fin whales have been depleted in many areas, although not as seriously as some other large whales taken commercially. The total population estimate is 214,000. This species is subject to Iceland commercial whaling operations in the North Atlantic.

Blue Whale

Balaenoptera musculus

Blue whales are well known for their length and overall size. The record accepted by biologists is nearly 102 ft for an animal found south of New Zealand. Blue whales are also known as sulphur bottom because of a definite yellow cast sometimes present on the belly and sides of the 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. The animals may change from pale to a distinct yellow color in less than a month in these waters. 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 newborn calf is about 24 ft long. Nursing lasts for 8 months during which the calf gains about 200 lbs a day. When weaned, they are about 50 ft long. A form of this species, known as the pygmy blue whale, is found in 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 estimate is over 11,000 animals. Blue whale sightings have increased in the last several years off the west coast of the United States.

Humpback Whale

Megaptera novaeangliae

The humpback whale is heavier bodied than other members of the family and their flippers make up one-third the total length of the body. The head has a variable number of bumps of blubber, each one 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 (phalanges). The trailing edge of the flukes is ragged, and individual humpbacks can be identified by the unique color pattern on the underside of the flukes when they are lifted clear of the water.

Humpback whales migrate to high latitudes where they approach but do not enter the polar pack ice zones. When wintering in tropical latitudes, they usually calve and breed in association with the shallow waters of islands and atolls. The breeding and calving season is October to March in the Northern hemisphere, and April to September in the Southern hemisphere. 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 2 years in a row. Females are larger than males, reaching 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 anchovies and sardines, but also on krill in high latitudes. Sometimes, they create a net of bubbles around a school of krill and then rise through the column of water engulfing the krill.

Humpback whales are seriously depleted; their estimated population is between 5,700 and 6,800 animals. The populations which have been studied are slow to recover. Their frequency in shallow coastal waters while both feeding and calving can subject them to harassment by tourists and entanglement in fishing gear.

Family Balaenidae

Right whales

Right whales have a high vaulted arch to the upper jaws and massive thick lower jaws which bear tall thick lips covering their baleen plates. This family contains two genera and three species. The right and bowhead whales have thick heavy bodies with tapered tails and wide expansive flukes. The skull is wide and massive, but when viewed from above, the elongated bones of the snout forward of the blow hole are like a narrow projection set between the huge lower lips. The seven vertebrae of the neck are fused together in this group of whales.

The smallest species in this family, the pygmy right whale (Caperea marginata), 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.

Balaenids have a distinctive double blow which rises above the animal before forming a cloud. These slow moving animals probably are not deep divers and often associate with 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 whaling expeditions that returned with finished products of oil and baleen instead of towed whales. 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. Right whales have growths (callocites) on the skin, over the eyes, the snout, and over 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 whales. It is possible to identify individual whales from the distribution and form of these growths. Right whales feed extensively on copepods. Males mature sexually when they reach about 50 ft in length; females mature when about 51 ft long. Breeding and calving take place in temperate tropical waters. Gestation lasts about 12 to 13 months.

Right whales have been protected from commercial whaling since 1938. Only the South Atlantic population, estimated at over 3,000 animals, shows evidence of increasing. The two northern hemisphere groups are threatened with extinction. The North Pacific population is estimated at 220 animals; the North Atlantic at 200 animals.

Bowhead Whale

Balaena mysticetus

The bowhead whale is circumpolar in arctic and subarctic waters. Their baleen plates, averaging 10 to 11 ft long, are the longest of any mysticete. Their baleen plates number between 250 and 300 on each side. They do not have a dorsal fin. Bowhead whales migrate in association with the seasonal movement of the Arctic pack ice. During their northward migration, they attempt to follow the narrow leads developed in the shore-fast ice. Bowhead whales can break ice several inches thick and will travel under large ice flows. They reach about 57 ft long and males sexually mature when they are about 38 ft long; females are about 40 ft long at sexual maturity. Breeding probably occurs in April or May during migration. Gestation appears to be 12 to 13 months. The newborn calf is 10 to 15 ft long at birth and the nursing period lasts about 6 months. This species usually travels alone or in twos or threes but has been observed in groups up to 50. They feed largely on krill, but include several other groups of invertebrates in their diet.

This species is severely depleted, and there is evidence that its population is declining. The Bering, Beaufort, and Chukchi Seas population is estimated at 2,300 animals. There is a subsistence take of this species by Arctic natives.

Suborder Odontoceti

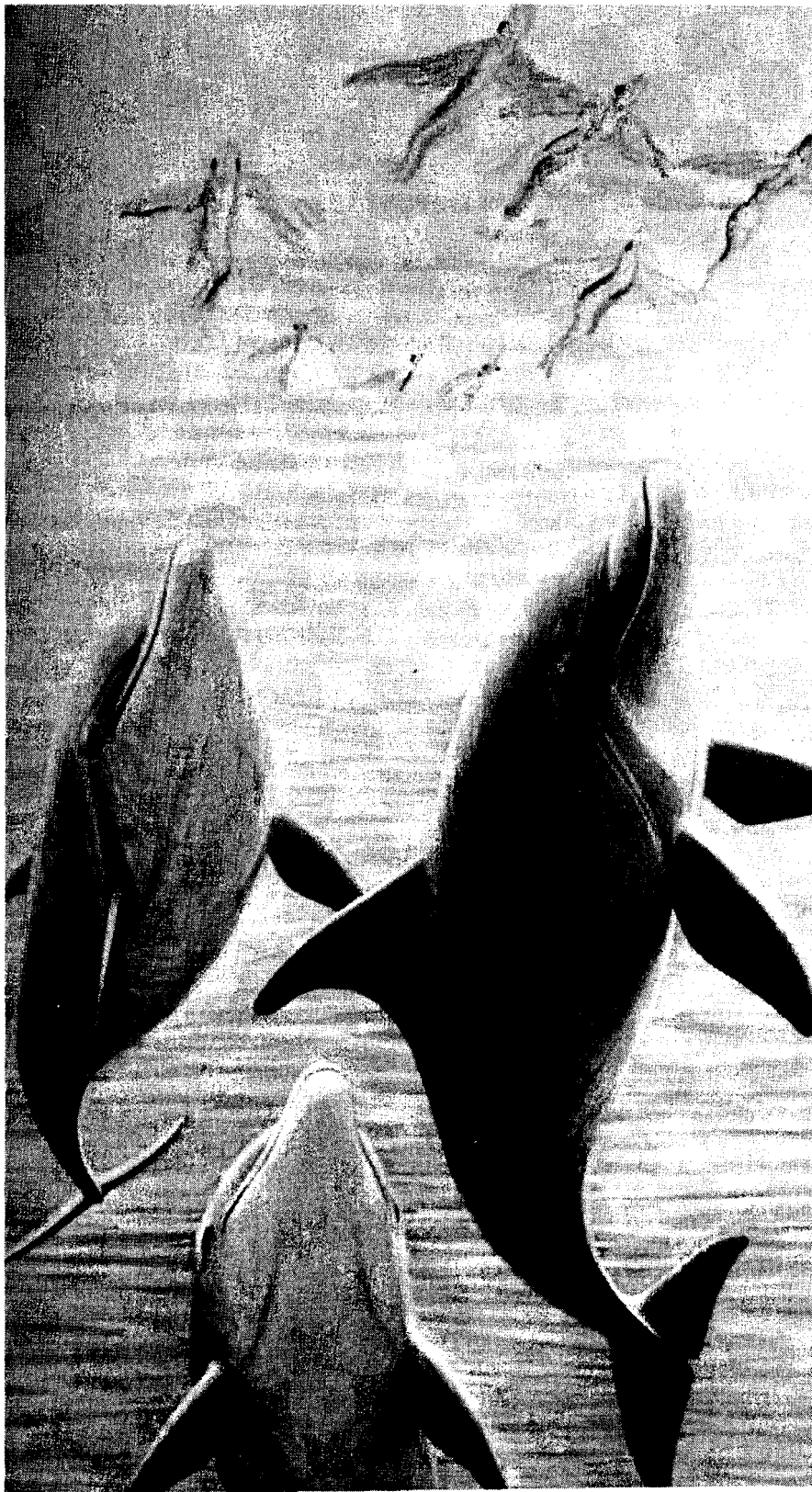
Toothed Whales

There are 65 species of whales, dolphins, and porpoises in this suborder. Most have teeth and demonstrate the development of 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 are broadcast in front of the swimming animal. Pads of this same 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. This series of structures makes it possible for toothed whales to echolocate, the method of locating objects by determining the time for an echo to return and its direction.

The brain of the toothed whales has one of the largest size to body weight ratios found in any group of mammals. Studies of anatomy and physiology of the brain of odontocetes show the areas associated with hearing are more developed than in other mammals which do not echolocate.

Toothed whales have the best developed diving abilities of all the cetaceans. At least four species are known to dive for an hour at a time, and at least four others regularly dive 30 minutes or more. In contrast, the baleen whales average 5 to 20 minute dives. Toothed whales are 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 these dolphins usually dive to 300 feet or less. Many studies of the diving accomplishments, particularly of toothed whales, have lead 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).



Bottlenose dolphins. Painting by Larry Foster.

Family Delphinidae

Dolphins

Both small and medium sized animals are included in this family as well as the larger pilot and killer whales. The delphinids move in large herds of 15 to 20 to several thousand. Extensive observations at sea over the past ten years have provided new insights into their social grouping 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, sometimes may constitute a role in the natural mortality of the host animals.

Studies of the teeth of several species have provided 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 better 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. They are similar in appearance to bottlenose dolphins, but have a smooth slope to the melon which gives the head a cone shape. They grow to about 7 ft in length and travel in schools of up to 50 animals. Sometimes they are seen with bottlenose, spinner, and spotted dolphins. They eat fish and squid. Their teeth are relatively large and have a series of vertical wrinkles, hence "rough toothed" dolphins. They are 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 ETP.

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. Studies on its physiology and behavior have become the basis for comparing information on other species of dolphins and whales. Many studies have been made on its echolocation, communication, and ability to learn and adapt to sound cues. Several species have been named in the genus Tursiops; however, many scientists believe there are two forms, coastal and oceanic, with the latter often found near oceanic islands or sea mounts and the continental shelf. Bottlenose dolphins feed on a wide variety of fish and probably concentrate on species which are seasonally abundant. The coastal form regularly feeds in shallow water and has been recorded driving fish on the banks of streams and lunging at them while they are onshore. They may feed alone but more often they feed in groups of 5 to several hundred. Seasonal movements along coastlines have been described, but this may be small groups gathering to pursue a species of fish. Groups of feeding bottlenose dolphins have been seen flapping their heads and tails against the water. Gestation is about one year and calves nurse for 1.5 to 2 years. Bottlenose dolphins ride the bow waves of passing vessels and are often seen accompanying large baleen whales. Adults reach about 12 ft in length and weigh about 1,400 lbs. Many specimens in captivity exceed 25 years of age.

There are no reliable estimates for the total world population. As a result of population studies on the U.S. east coast, the minimum estimate is 3,000 to 10,000 animals.

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. These dolphins occur in herds of several hundred animals in the eastern tropical Pacific. Adults average 5.6 ft in length and have a prominent triangular dorsal fin. The young are about 2.5 ft long when born after a gestation period of 10.6 months. Generally, their beaks are long. Spinner dolphins feed on mid-water lantern fish and other fish species. Their diet includes some squid and 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 where it is taken in the yellowfin tuna purse seine fishery. Its population is estimated at about 2 million in the ETP and is considered abundant elsewhere in its widespread range.

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. The relationship of the several forms is not understood well 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 newborn is 2 1/2 ft. The nursing period is about 11 months. Spotted dolphins feed on a variety of midwater and surface fishes and squids.

Population increases have been recorded for some of the identified stocks of this species in the ETP where it is taken incidentally in the yellowfin tuna purse seine fishery. The population in the ETP is estimated at 3.9 million animals.

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 the skin. The body is more robust than other species in the genus Stenella, and the dorsal fin is similar to that of bottlenose dolphins. They reach an adult 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 with some success. There is insufficient information to discuss population levels for this species.

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 their 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 is reported to travel in herds of 20 to 50 to several hundred animals. Striped dolphins are occasionally involved in strandings.

In the ETP, where the striped dolphin is moderately involved in the yellowfin tuna purse seine fishery, its population is estimated at 248,000 animals. Population estimates for other parts of its range are not available.

Common Dolphin

Delphinus delphus

The common dolphin is an oceanic species infrequently found in the shallower 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 lasts 10 to 11 months and the newborn are about 2 1/2 ft long. The young are weaned at 1 to 3 years of age. They travel in groups of 40 to several thousand. These large groups 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 ETP where its population is estimated at 1.5 million animals. There are no reliable population data for this species in other parts of its range.

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 of the world's oceans. 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), hence the generic name Lagenodelphis. 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.

The recent discovery of this species and the fact that it occurs in areas not involved in cetacean population research does not allow reliable estimates of its numbers. It is marginally involved in the yellowfin tuna purse seine fishery in the ETP.

Atlantic White-sided Dolphin

Lagenorhynchus acutus

This dolphin is primarily an oceanic species, but is observed seasonally in coastal waters. They are found in temperate waters of the North Atlantic. 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 not known. This species is involved in mass strandings. It is usually wary of ships and does not commonly ride their bow waves. They frequently associate with pilot whales and have not been maintained in captivity.

The distribution of this dolphin is not well understood, although they are common for several months of the year in several locations along the eastern coast of the United States. Estimates for the western North Atlantic populations are being developed.

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 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, but the diet also includes 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. 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 recorded diving for over 6 minutes. 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 species.

Risso's Dolphin

Grampus griseus

Risso's dolphin, found in tropical and temperate waters of the world's oceans, reaches a length of about 13 ft. 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. These long white scratches may be caused by the tooth marks of other Risso's dolphins or large squid. After breaching and flopping on their sides for several minutes at a time, these dolphins like to loll at the surface and slowly mill about. They usually are shy of small vessels, but they have been seen riding the bow waves of ships. When traveling, their synchronized leaps in the water closely resemble bottlenose dolphins. They have tall triangular dorsal fins and blunt heads. There is a prominent crease in the front of the melon. There are seven large teeth in each side of the lower jaw, although in older animals they may be worn or missing. They feed largely on squid, and some species of fish have been found in their stomachs. Aquariums have maintained individuals species for several years.

There are no reliable population estimates for this species.

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. The body is elongated, the jaws are somewhat pointed, and the dorsal fin is large. A stranding of 250 melon-headed whales was recently investigated in Costa Rica. This species is minimally involved in the yellowfin tuna fishery.

This species 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.

Male false killer whales reach about 18 ft long and females about 13 ft; they weigh up to 3,600 lbs. Newborn calves are about 6 ft long. The body is elongated; the head narrow and markedly tapered (in contrast to pilot whales). The shape of the dorsal fin is similar to that of bottlenose dolphins. Their 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. The largest mass stranding of cetaceans ever recorded involved over 800 false killer whales at La Plata, Argentina, in 1946. Several other large 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. They have a distinctive broad based dorsal fin. This species is commonly involved in large mass strandings.

There is a long history of directed fisheries for this species both in Europe and North America dating back to the 1500's. As a result of these periodic exploitations, some local populations recorded as depleted have been restored.

There are no reliable population estimates for this species.

Short-finned Pilot Whale

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. They travel in groups of 60 or more animals although smaller groups are more frequent. They feed primarily on squid and a variety of fish. Adults are 15 to 21 ft long. There is little information on the reproductive biology. The species frequently is involved in mass strandings.

There is some limited aboriginal 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. Adult males are about 17 ft long and females about 24 ft long. 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. They are highly predatory and feed on squid, sea turtles, fishes, sea birds, whales, dolphins, and seals. This species attacks its prey as a group and organizes 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. 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.

Family Phocoenidae

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. It is often found in harbors, bays and sometimes fresh water estuaries. This species is seen in schools up to 200 or more. Their local abundance often depends upon seasonal fish prey. They are considered deep divers that usually travel just below the surface and rise frequently to breathe when not feeding. They feed on several species of fish in shallow water including cod, herring, and flounder as well as squid, clams and crustaceans. Schools segregated by sex are common. They are small chunky animals without a beak. They generally are shy of boats and are not known to ride bow waves.

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 populations cannot be made.

Dall's Porpoise

Phocoenoides dalli

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 have 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 species of fish. They are heavy bodied reaching about 7 ft in length and weighing up to 500 lbs. This porpoise often travels in groups of 2 to 5 and sometimes 10 to 20; although, large groups have been seen during migration.

In the central North Pacific, this species is accidentally taken 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 as 12 to 13 million years old.

They do not have a dorsal fin, and the separate vertebrae in the neck allows the head to turn at a sharp angle. The snout does not have a beak and the melon is large and prominent. The flippers are fan-shaped and curl upward while the animal swims. Both species have pronounced asymmetrical skulls. A series of well developed muscles attached to crests on the skull allow the head to move with greater freedom than other cetaceans.

Beluga

Delphinapterus leucas

The beluga is generally a circumpolar Arctic basin species, although some populations exist along the southern coast of Alaska; one population is found along the Pacific Coast of Alaska (Cook Inlet). Throughout most of its range, it is in frequent contact with the ice pack and ice floes. It does not have a dorsal fin, and its solid white coloring distinguishes the beluga 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; females grow to about 14 ft long. Gestation is probably 15 months and the newborn calves are about 5 ft long. Nursing lasts 20 months, and the reproductive cycle is about 3 years. They often travel in groups of 2 to 3, but seasonally are found in groups of several hundred. They are frequently found in shallow waters. Their diet includes salmon, capelin, pike, cod, squid, crustaceans and other invertebrates. They break the ice with their bodies to maintain a breathing space.

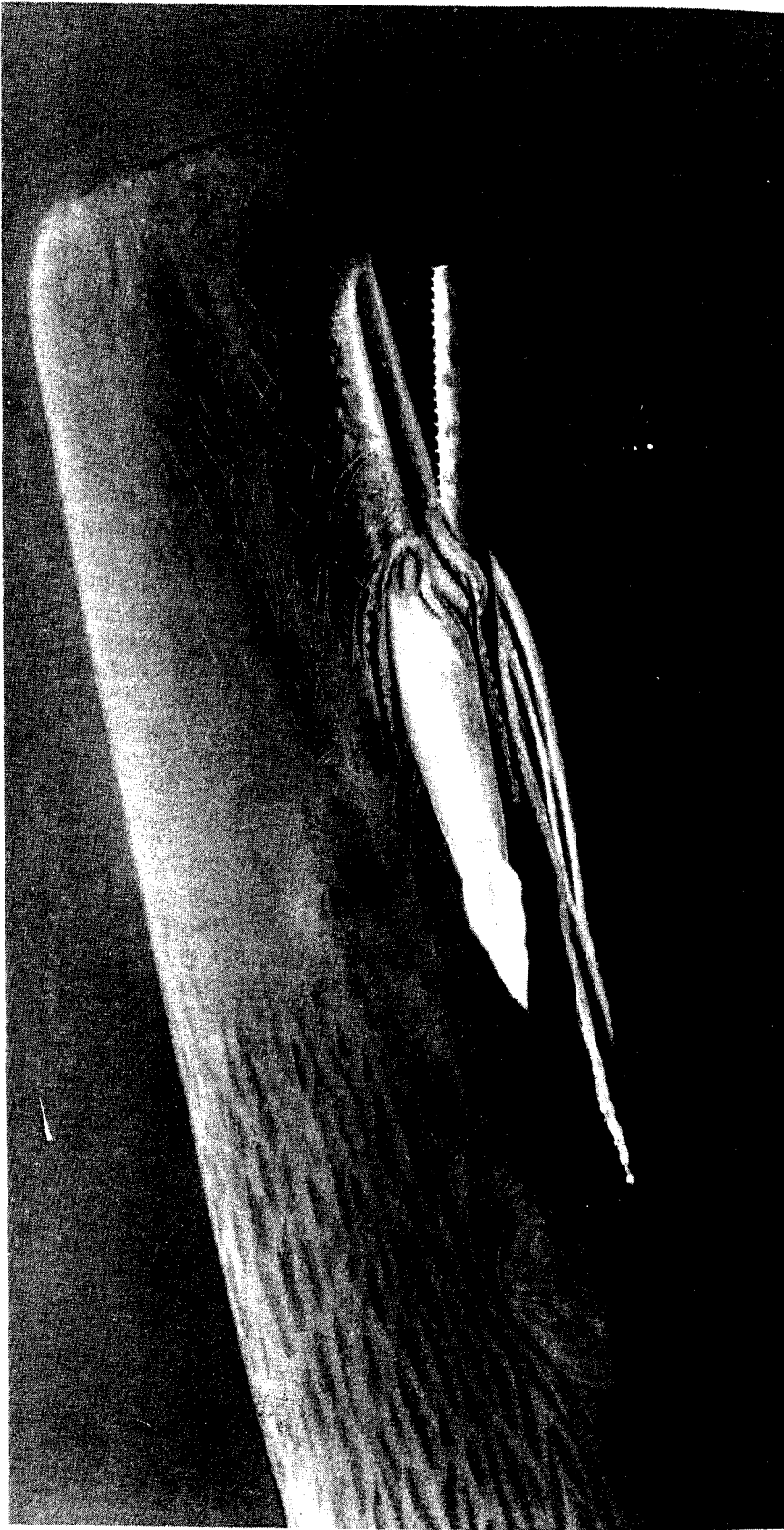
Belugas are taken by natives in the circumpolar areas for subsistence. The population of the beluga whale fluctuates widely in some areas. Because they are frequently found in shallow coastal waters and estuaries of large rivers, these populations may be subject to environmental changes. The circumpolar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

Narwhal

Monodon monoceros

Narwhals inhabit all the Arctic Ocean basin and occasionally are seen just below the Arctic circle. The male species is distinguished by a tusk from 3 to 5 ft long. They are a deep water species traveling in pods of 6 to 20 animals that may be segregated 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. This species has not been maintained in captivity with any success. 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.

The population estimate for this species in the Canadian area of its range is 10,000 animals. There are no reliable estimates for other areas.



Sperm whale with squid. Painting by Larry Foster.

Family Physeteridae

Sperm Whales

There are three living species in the sperm whale family. Two are in the genus Kogia and are relatively small in comparison to the sperm whale Physeter catodon. This family, found in the fossil record 25 million years ago, currently has some 20 genera and 30 species. The skull structure of the fossils suggests they had developed melons and were deep divers. The teeth are relatively large and widely spaced in the lower jaw, but are absent in the upper jaw.

Physeterids 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 oil in each animal resulted in the development of a large industry of sperm whaling. The oil was a major source of fuel for lamps and candles in the early and middle 1800's in North America and Europe.

Physeterids 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. 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 as do sea lions and fur seals. The head of a sperm whale is about one-third the total length of the animal and its dominant structure is the melon. 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 as in other toothed whales. 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. 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. There is not a distinct dorsal fin, but 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, 300,000 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. There are 12 to 16 large teeth in 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 as in other toothed whales.

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 continental shelf slope and the open sea. Analysis of the stranding records of small groups of this species suggest 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. Their frequency in the stranding record, however, indicates that they are abundant in several areas. Neither species lends itself behaviorally to observational techniques used in estimating populations. The blow is very thin and dissipates rapidly so that an observer at sea literally has to see the animal as it moves to breathe. 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 is no population estimate 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. Ageing this species on the basis of tooth studies has proven difficult. They feed largely on squid, and often have no teeth in the upper jaw; the teeth in the lower jaw are shorter and more slender than in other species. The tall dorsal fin is similar to others in the dolphin family.

There is no population estimate 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. The largest source of knowledge of this family is based on the examination of stranded specimens, except for the giant bottlenose and Baird's beaked whale which are taken commercially.

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 recorded. They are often seen traveling in pairs, yet 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.

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Appendix A

TABLE 1 1980 GENERAL PERMITS - COMMERCIAL FISHING INCIDENTAL TAKE ¹.

		PINNIPEDIA				CETACEA		TOTAL	
		<u>Otariidae</u>		<u>Phocidae</u>					
		Applied for	Allowed	Applied for	Allowed	Applied for	Allowed	Applied for	Allowed
Category 1:	Domestic (PCFFA) ⁴ .	350	350	250	250	0	0	600	600
Towed or	Japan (Deep Sea)	70	70	0	3	2	2	72	75
Dragged	Japan (Medium) ² .	0	0	0	0	0	0	0	0
Gear	USSR (Sovrybflot)	200	200	10	10	10	10	220	220
	Poland (ODRA)	28	25	28	25	17	15	73	65
	Poland (DALMOR)	27	25	27	25	20	15	74	65
	Domestic (Chipman) ³ .	8	0	10	0	0	0	18	0
	West Germany	<u>40</u>	<u>5</u>	<u>40</u>	<u>5</u>	<u>40</u>	<u>2</u>	<u>120</u>	<u>12</u>
Subtotal		723	675	365	318	89	44	1,177	1,037
Category 3:	Domestic (PCFFA) ⁴ .	300	300	400	400	40	40	740	740
Encircling	Domestic (Chipman) ³ .	8	0	10	0	0	0	18	0
Gear, Not Involving Intentional Taking		—	—	—	—	—	—	—	—
Subtotal		308	300	410	400	40	40	758	740
Category 4:	Domestic (PCFFA) ⁴ .	40	40	50	50	0	0	90	90
Stationary	Domestic (Chipman) ³ .	7	0	10	0	0	0	17	0
Gear		—	—	—	—	—	—	—	—
Subtotal		47	40	60	50	0	0	107	90
Category 5:	Domestic (PCFFA) ⁴ .	450	450	600	600	40	40	1,090	1,090
Other Gear	Japan (Longline) ² .	0	0	0	0	0	0	0	0
	Domestic (Chipman) ³ .	<u>7</u>	<u>0</u>	<u>10</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>17</u>	<u>0</u>
Subtotal		457	450	610	600	40	40	1,107	1,090

1. Except Category 2: Encircling Gear, Involving the Intentional Taking of Marine Mammals
2. Requested harassment only, no mortality or serious injury intended
3. Application denied, combined with PCFFA permit
4. Permit valid through December 31, 1981

TABLE 2

1981 GENERAL PERMITS - COMMERCIAL FISHING INCIDENTAL TAKE ^{1.}

		PINNIPEDIA				CETACEA		TOTAL	
		<u>Otariidae</u>		<u>Phocidae</u>					
		Applied for	Allowed	Applied for	Allowed	Applied for	Allowed	Applied for	Allowed
Category 1:	Domestic (PCFFA)	350	350	250	250	0	0	600	600
Towed or	Japan (Deep Sea)	20	20	20	20	1	1	41	41
Dragged	Japan (Medium) ^{2.}	0	0	0	0	0	0	0	0
Gear	Poland (GRYF)	24	24	24	24	15	15	63	63
	Poland (ODRA)	40	25	40	25	24	15	104	65
	Poland (DALMOR)	48	25	48	25	30	15	126	65
	Domestic (Chipman) ^{3.}	8	0	10	0	0	0	18	0
	Spain (ANAVAR)	20	20	20	20	20	20	60	60
	West Germany	60	20	60	20	60	20	180	60
	Subtotal	570	484	472	384	150	86	1,192	954
Category 3:	Domestic (PCFFA)	300	300	400	400	40	40	740	740
Encircling	Domestic (Chipman) ^{3.}	8	0	10	0	0	0	18	0
Gear, Not									
Involving									
Intentional									
Taking									
	Subtotal	308	308	410	400	40	40	758	740
Category 4:	Domestic (PCFFA)	40	40	50	50	0	0	90	90
Stationary	Domestic (Chipman) ^{3.}	7	0	10	0	0	0	17	0
Gear									
	Subtotal	47	40	60	50	0	0	107	90
Category 5:	Domestic (PCFFA)	450	450	600	600	40	40	1,090	1,090
Other Gear	Japan (Longline) ^{2.}	0	0	0	0	0	0	0	0
	Domestic (Chipman) ^{3.}	7	0	10	0	0	0	17	0
	Subtotal	457	450	610	600	40	40	1,107	1,090

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1. Except Category 2: Encircling Gear, Involving the Intentional Taking of Marine Mammals
2. Requested harassment only, no mortality or serious injury intended
3. Application denied, combined with PCFFA permit

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	CEHPALORHYNCHUS 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
FRASER'S (SARAWAK) DOLPHIN	LAGENODELPHIS HOSEI
GINKGO-TOOTHED BEAKED WHALE	MESOPLODON GINKGODENS
GRAY WHALE	ESCHRICHTIUS ROBUSTUS
HARBOR PORPOISE	PHOCOENA PHOCOENA
HEAVISIDE'S DOLPHIN	CEHPALORHYNCHUS 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
NORTHERN RIGHT WHALE DOLPHIN	LISSODELPHIS BOREALIS
PACIFIC WHITE-SIDED DOLPHIN	LAGENORHYNCHUS OBLIQUIDENS
PILOT WHALES UNSPECIFIED	GLOBICEPHALA SP.
PYGMY KILLER WHALE	FERESA ATTENUATA
PYGMY SPERM WHALE	KOGIA BREVICEPS
RIGHT WHALES UNSPECIFIED	BALAENA SP.
RISSE'S DOLPHIN, GRAMPUS	GRAMPUS GRISEUS
ROUGH-TOOTHED DOLPHIN	STENO BREDANENSIS
SEI WHALE	BALAENOPTERA BOREALIS
SHORT-FINNED PILOT WHALE	GLOBICEPHALA MACRORHYNCHUS
SOUTHERN RIGHT WHALE	BALAENA AUSTRALIS
SPERM WHALE	PHYSETER CATODON

TABLE 4
SYNOPSIS OF PERMIT APPLICATIONS

	AS OF MARCH 31, 1980		APRIL 1, 1980 TO MARCH 31, 1981		AS OF MARCH 31, 1981	
	SCIENTIFIC RESEARCH	PUBLIC DISPLAY	SCIENTIFIC RESEARCH	PUBLIC DISPLAY	SCIENTIFIC RESEARCH	PUBLIC DISPLAY
NO. OF APPLICATIONS SUBMITTED	171	226	8	30	26	1
NO. OF ANIMALS REQUESTED(TOTAL) OF THESE:	551,721	1,202	321	12,019	89	0
TAKEN BY KILLING	19,181	0	0	3,000	0	0
TAKEN AND KEPT ALIVE	407	1,056	99	4	38	0
KILLED IN CAPTIVITY	49	0	0	0	0	0
TAKEN AND RELEASED	516,835	44	219	8,665	0	0
FOUND DEAD	1,329	0	0	0	0	0
STRANDED/EXCHANGED	74	102	3	25	51	0
IMPORTS	1,042	0	0	200	0	0
HARASS	12,804	0	0	125	0	0
ACTION TAKEN						
NO. OF APPLICATIONS FORWARDED TO MARINE MAMMAL COMMISSION	138	170	5	21	16	0
NO. OF APPLICATIONS REVIEWED BY MARINE MAMMAL COMMISSION	135	167	5	14	11	0
NO. OF APPLICATIONS WITHDRAWN	5	16	1	3	0	0
NO. OF APPLICATIONS REFERRED TO FISH AND WILDLIFE	0	0	0	3	0	0
NO. OF APPLICATIONS REFERRED TO STATES	13	1	0	3	0	0
NO. OF APPLICATIONS REFERRED TO REGIONS	4	12	1	3	0	0
NO. OF APPLICATIONS RESOLVED THROUGH AGREEMENT	1	2	0	3	0	0
NO. OF APPLICATIONS RETURNED DUE TO INSUFFICIENT OR INAPPROPRIATE SUBMITTAL	12	29	1	3	0	0
NO. OF APPLICATIONS DENIED	2	7	0	3	0	0
NO. OF APPLICATIONS APPROVED	134	159	5	3	0	0
NO. OF APPLICATIONS PENDING	0	0	0	14	13	0
NO. OF ANIMALS APPROVED(TOTAL) OF THESE:	551,120	736	263	1,329	21	0
TAKEN BY KILLING	17,651	0	0	800	0	0
TAKEN AND KEPT ALIVE	377	661	88	4	9	0
KILLED IN CAPTIVITY	49	0	0	0	0	0
TAKEN AND RELEASED	515,435	0	175	300	0	0
FOUND DEAD	847	0	0	0	0	0
STRANDED/EXCHANGED	59	75	0	25	12	0
IMPORTS	1,020	0	0	100	0	0
HARASS	15,682	0	0	100	0	0
CUMULATIVE TOTAL						
						462
						565,352
						22,181
						1,604
						49
						525,763
						1,329
						255
						1,242
						12,929

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)

COMMON NAME(2)	R E Q U E S T E D				R E Q U E S T E D				CUMULAT- IVE TOTAL
	AS OF MARCH 31, 1980		APRIL 1, 1980		THRU		MARCH 31, 1981		
	TAKEN AND KEPT KILLING ALIVE	TAKEN OR FOUND AND DEAD/ STRND	TAKEN AND KEPT KILLING ALIVE	TAKEN OR FOUND AND DEAD/ STRND	TAKEN AND KEPT KILLING ALIVE	TAKEN OR FOUND AND DEAD/ STRND	TAKEN AND KEPT KILLING ALIVE	TAKEN OR FOUND AND DEAD/ STRND	
BAIRD'S BEAKED WHALE		25	6					31	
BLACK RIGHT WHALE, NORTHERN RIGHT		10						10	
BLUE WHALE		65						75	
BOTTLENOSE DOLPHINS	70	51,299	24	36	15	6		51,974	
BONHEAD WHALE		50	40					210	
BRIDE'S WHALE		420						420	
COMMERSON'S DOLPHIN	6							6	
COMMON DOLPHIN	155	75,777	9		15			75,982	
CUVIER'S BEAKED WHALE	2							2	
DALL'S PORPOISE		910	18					928	
DUSKY DOLPHIN		61						61	
DWARF SPERM WHALE			3					3	
FALSE KILLER WHALE	14	6						20	
FIN WHALE, FINBACK		365			20			385	
FINLESS PORPOISE	6							6	
FRASER'S (SARAWAK) DOLPHIN	70	1,050						1,120	
GINKGO-TOOTHED BEAKED WHALE			3					3	
GRAY WHALE		219	11					230	
HARBOR PORPOISE		188	49					264	
HUBBS' BEAKED WHALE			6					6	
HUMPBACK WHALE		190			30			220	
KILLER WHALE		85	23	6				128	
LONG-FINNED PILOT WHALE		30	30					60	
MELON-HEADED WHALE, ELECTRA	45	300						349	
MINKE WHALE		810	3					833	
NORTHERN RIGHT WHALE DOLPHIN		130	18					150	
PACIFIC WHITE-SIDED DOLPHIN		521	48					594	
PILOT WHALES UNSPECIFIED	4							19	
PYGMY KILLER WHALE	45	300						353	
PYGMY SPERM WHALE			6					6	
RISSEO'S DOLPHIN, GRAMPUS	70	1,105	15					1,200	
ROUGH-TOOTHED DOLPHIN	70	5,050						5,129	
SEI WHALE		450						470	
SHORT-FINNED PILOT WHALE	70	135	33					263	
SPERM WHALE								1,055	
SPINNER DOLPHIN	2,929	1,035						106,973	
SPOTTED DOLPHIN	4,925	104,017						162,778	
STENELLENE DOLPHINS		157,843						103	
STRIPED DOLPHIN, STREAKER	100	100	3					103	
UNSPECIFIED CETACEANS	340	50,050						50,165	
VAQUITA, COCHITO		1,241						1,624	
WHITE WHALE, BELUKHA	55		2					125	
WHITE-BEAKED DOLPHIN			50					2	
TOTALS:(3)	8,944	793	0	453,837(4)	400	42	330	6 464,352	

(1) SPECIMEN IMPORTS AND HARASSMENT REQUESTS NOT INCLUDED IN THIS TABLE.
(2) PLEASE REFER TO TABLE 3 OF THIS APPENDIX FOR THE APPROPRIATE SCIENTIFIC NAMES.
(3) 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 CETACEA.
(4) A SINGLE APPLICATION REQUESTED 432,850 CETACEANS AND ACCOUNTS FOR NEARLY THE TOTAL NUMBER IN THIS CATEGORY.

TABLE 6
NUMBER OF PINNIPEDS REQUESTED IN SCIENTIFIC RESEARCH/PUBLIC DISPLAY PERMIT APPLICATIONS(1)

COMMON NAME(2)	R E Q U E S T E D AS OF MARCH 31, 1980				R E Q U E S T E D APRIL 1, 1980 THRU MARCH 31, 1981				CUMULAT- IVE TOTAL REQUESTED
	TAKEN BY KILLING	TAKEN AND KEPT ALIVE	KILLED IN CAPTIVITY	TAGGED OR FOUND RELEASED	TAKEN AND KEPT ALIVE	TAKEN AND KEPT ALIVE	KILLED IN CAPTIVITY	TAGGED OR FOUND RELEASED	
ARCTOCEPHALINE FUR SEALS	2			80					82
BAIKAL SEAL		4							4
BEARDED SEAL	550		10	950	300		200		2,010
CALIFORNIA SEA LION	680	475	425	1,085				55	2,720
CASPIAN SEAL		2		8,425					2
CRABEATER SEAL	2,688								11,113
GRAY SEAL		30						1	31
HARBOR SEALS	1,586	105	179	5,140	650		715	14	8,389
HARP SEAL, GREENLAND SEAL		40							40
HAWAIIAN MONK SEAL		2		1,558			15		1,575
KEGUELEN FUR SEAL	131			750					881
LEOPARD SEAL	588	8		2,700	600		500		2,120
NORTHERN ELEPHANT SEAL	150	13	300	18,393			30		3,296
NORTHERN FUR SEAL		32	3						18,886
NORTHERN SEA LION, STELLER SEA LION	645		116	12,500	350		6,000		19,611
RIBBON SEAL	430			100	300		300		1,130
RINGED SEAL	990	8		1,254	600		500		3,377
ROSS SEAL	273	6		885					1,164
SOUTH AFRICAN FUR SEAL		6		10					16
SOUTH AMERICAN SEA LION		12							12
SOUTHERN ELEPHANT SEAL	133			260					393
UNSPECIFIED MARINE MAMMALS			50						50
UNSPECIFIED PINNIPEDS			12	100					112
WALRUS	400				200				600
WEDDELL SEAL	571	25	37	8,471			50		9,154
WEST INDIAN MANATEE		1							1
TOTALS:(3)	10,237	769	49	63,261	1,108	3,000	8,310	70	86,804

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

(2) PLEASE REFER TO TABLE 3 OF THIS APPENDIX FOR THE APPROPRIATE SCIENTIFIC NAMES.

(3) 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(2)	A U T H O R I Z E D AS OF MARCH 31, 1980		A U T H O R I Z E D APRIL 1, 1980 THRU MARCH 31, 1981		CUMULAT- IVE TOTAL AUTHORIZED
	TAKEN AND KEPT ALIVE	TAKEN OR FOUND AND DEAD/ STRND	TAKEN AND KEPT ALIVE	TAKEN OR FOUND AND DEAD/ STRND	
ATLANTIC WHITE-SIDED DOLPHIN	---	5	---	---	5
BLACK RIGHT WHALE, NORTHERN RIGHT	---	10	---	---	10
BLUE WHALE	---	40	---	---	40
BOTTLENOSE DOLPHINS	70	51,304	12	---	51,769
BOWHEAD WHALE	---	50	---	---	300
BRYDE'S WHALE	---	410	---	---	410
COMMON DOLPHIN	155	75,777	---	---	75,950
DALL'S PORPOISE	---	910	---	---	910
DUSKY DOLPHIN	---	61	---	---	61
FALSE KILLER WHALE	---	6	---	---	18
FIN WHALE, FINBACK	---	340	---	---	340
FRASER'S (SARAWAK) DOLPHIN	70	1,050	---	---	1,120
GRAY WHALE	---	219	---	---	304
HARBOR PORPOISE	---	105	---	---	112
HUMPBACK WHALE	---	150	---	---	150
KILLER WHALE	---	85	1	---	95
LONG-FINNED PILOT WHALE	---	30	---	---	60
MELON-HEADED WHALE, ELECTRA	45	300	---	---	349
MINKE WHALE	---	800	---	---	800
NORTHERN RIGHT WHALE DOLPHIN	---	130	---	---	130
PACIFIC WHITE-SIDED DOLPHIN	---	521	---	---	538
PYGMY KILLER WHALE	45	300	---	---	349
RISSE'S DOLPHIN, GRAMPUS	70	1,105	---	---	1,183
ROUGH-TOOTHED DOLPHIN	70	5,050	---	---	5,129
SEI WHALE	---	440	---	---	440
SHORT-FINNED PILOT WHALE	70	135	---	---	227
SPERM WHALE	---	860	---	---	860
SPINNER DOLPHIN	2,929	104,017	---	---	106,967
SPOTTED DOLPHIN	4,925	157,843	---	---	162,778
STENELLINK DOLPHINS	---	100	---	---	100
STRIPED DOLPHIN, STREAKER	100	50,050	---	---	50,150
UNSPECIFIED CETACEANS	340	914	---	---	1,297
VAQUITA, COCHITO	---	---	---	---	2
WHITE WHALE, BELUKHA	15	50	---	---	85
WHITE-BEAKED DOLPHIN	---	---	---	---	2
TOTALS:(3)	8,904	453,117(4)	308	120	463,040

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

(2) PLEASE REFER TO TABLE 3 OF THIS APPENDIX FOR THE APPROPRIATE SCIENTIFIC NAMES.

(3) 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.

(4) 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(2)	A U T H O R I Z E D AS OF MARCH 31, 1980			A U T H O R I Z E D APRIL 1, 1980 THRU MARCH 31, 1981			CUMULAT- IVE TOTAL AUTHORIZED
	TAKEN AND KEPT ALIVE	KILLED IN CAPTIVITY	TAGGED OR RELEASED	TAKEN AND KEPT ALIVE	KILLED IN CAPTIVITY	TAGGED OR RELEASED	
ARCTOCEPHALINE FUR SEALS	2		80				82
BAIKAL SEAL		4					4
BEARDED SEAL	330		950	100			1,390
CALIFORNIA SEA LION	680	319	1,055			23	2,367
CASPIAN SEAL		2					2
CRABEATER SEAL	2,688		8,425				11,113
GRAY SEAL		24	5				29
HARBOR SEALS	1,296	68	4,795	150		14	6,456
HARP SEAL, GREENLAND SEAL		40					40
HAWAIIAN MONK SEAL			1,145				1,145
KERGUELEN FUR SEAL	131		750				881
LARGHA SEAL, SPOTTED SEAL	220	6	600	100			926
LEOPARD SEAL	588	8	2,700				3,296
NORTHERN ELEPHANT SEAL	150	6	18,393		30		18,861
NORTHERN FUR SEAL		20					20
NORTHERN SEA LION, STELLER SEA LION	630		12,500	50			13,188
RIBBON SEAL	330		100	100			530
RINGED SEAL	710	8	1,254	100			2,097
ROSS SEAL	273	6	885				1,164
SOUTH AFRICAN FUR SEAL			10				10
SOUTH AMERICAN SEA LION		12					12
SOUTHERN ELEPHANT SEAL	133		260				393
UNSPECIFIED MARINE MAMMALS	15		15				30
UNSPECIFIED PINNIPEDS			100	25			137
WALRUS				200			200
WEDDELL SEAL	571	25	8,471			50	9,154
TOTALS: (3)	8,747	548	62,493	800	0	180	73,527

(1) SPECIMEN IMPORTS AND HARASSMENT ACTIVITIES NOT INCLUDED IN THIS TABLE.
(2) PLEASE REFER TO TABLE 3 OF THIS APPENDIX FOR THE APPROPRIATE SCIENTIFIC NAMES.
(3) 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, 1981

SPECIES(1)	***** PERMITS *****			***** NUMBER OF ANIMALS *****						
	ISSUED	EXPIRED	CURRENT	REQUESTED	AUTHORIZED	REPLACEMENTS	AUTHORIZATION EXPIRED	TAKEN (2)	TAKE REMAINING	
BOTTLENOSE DOLPHINS	73	53	20	469	455	20	66	282	134	
COMMON DOLPHIN	5	2	3	181	173	5	20	295	131	
FALSE KILLER WHALE	4	1	3	12	12	0	2	1	9	
FRASER'S (SARAWAK) DOLPHIN	2	1	1	70	70	0	20	0	50	
HARBOR PORPOISE	1	0	1	6	6	0	0	0	6	
KILLER WHALE	4	3	1	11	10	0	0	10	0	
MELON-HEADED WHALE, ELECTRA	3	2	1	49	49	0	22	2	25	
PACIFIC WHITE-SIDED DOLPHIN	4	3	1	17	17	0	8	22	6	
PYGMY KILLER WHALE	3	2	1	49	49	0	24	0	25	
RISSE'S DOLPHIN, GRAMPUS	4	1	3	78	78	0	20	1	57	
ROUGH-TOOTHED DOLPHIN	5	3	2	79	79	2	25	8	52	
SHORT-FINNED PILOT WHALE	10	7	3	93	92	3	28	17	52	
SPINNER DOLPHIN	4	2	2	2,956	2,950	3	23	688	2,769	
SPOTTED DOLPHIN	3	1	2	4,935	4,935	0	20	1,684	4,668	
STRIPED DOLPHIN, STREAKER	1	0	1	100	100	0	0	54	100	
UNSPECIFIED CETACEANS	4	3	1	383	383	0	348	1	35	
WHITE WHALE, BELUKHA	6	2	4	35	35	1	0	19	17	
WHITE-BEAKED DOLPHIN	1	0	1	2	2	0	0	0	2	
TOTAL NUMBER OF ANIMALS:				9,525	9,495	34	626	3,084	8,138	

(1) PLEASE REFER TO TABLE 3 OF THIS APPENDIX FOR THE APPROPRIATE SCIENTIFIC NAMES.

(2) 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, 1981

SPECIES(1)	***** PERMITS *****			***** NUMBER OF ANIMALS *****						
	ISSUED	EXPIRED	CURRENT	REQUESTED	AUTHORIZED	REPLACEMENTS	AUTHORIZATION EXPIRED	TAKEN (2)	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	6	2	4	430	430	0	83	86	261	
CALIFORNIA SEA LION	72	69	3	1,018	999	13	128	262	630	
CASPIAN SEAL	1	1	0	2	2	0	2	0	0	
CRABEATER SEAL	4	2	2	2,688	2,688	0	127	8	2,553	
GRAY SEAL	3	3	0	24	24	0	11	13	0	
HARBOR SEALS	31	26	5	1,540	1,514	0	449	713	355	
HARP SEAL, GREENLAND SEAL	1	1	0	40	40	0	20	20	0	
KERGUELEN FUR SEAL	2	1	1	131	131	0	6	0	125	
LARGHA SEAL, SPOTTED SEAL	5	1	4	320	326	0	6	68	263	
LEOPARD SEAL	6	3	3	596	596	0	30	38	528	
NORTHERN ELEPHANT SEAL	2	1	1	156	156	0	3	22	132	
NORTHERN FUR SEAL	2	1	1	20	20	0	0	10	10	
NORTHERN SEA LION, STELLER SEA LION	6	1	5	680	680	0	10	257	413	
RIBBON SEAL	6	2	4	430	430	0	110	61	259	
RINGED SEAL	8	2	6	818	818	0	382	215	221	
ROSS SEAL	5	3	2	279	279	0	14	1	264	
SOUTH AMERICAN SEA LION	3	3	0	12	12	0	4	8	0	
SOUTHERN ELEPHANT SEAL	3	2	1	133	133	0	8	0	125	
UNSPECIFIED MARINE MAMMALS	1	1	0	0	15	0	11	4	0	
UNSPECIFIED PINNIPEDS	1	1	0	12	12	3	15	0	0	
WALRUS	1	0	1	200	200	0	0	0	200	
WEDDELL SEAL	6	4	2	633	633	0	44	60	529	
TOTAL NUMBER OF ANIMALS:				10,168	10,144	16	1,465	1,850	6,868	

(1) PLEASE REFER TO TABLE 3 OF THIS APPENDIX FOR THE APPROPRIATE SCIENTIFIC NAMES.

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

Table 11

DEPARTMENT OF COMMERCE

MARINE MAMMAL PROTECTION ACT (MMPA) APPROPRIATIONS
AND OTHER MARINE MAMMAL FUNDING FY 1973-1981

(in thousands of dollars)

Fiscal Year	MMPA Funding ¹			Other Funds				Total
	Section 110	Section 114	MMPA Subtotal	Fur Seal Act	Endangered Species Act	S/K	Fish and Wildlife Act	
73	550.0 ²	400.0	950.0	----	----	----	----	950.0
74	550.0	1050.0	1600.0	----	----	----	390.0	1990.0
75	550.0	1050.0	1600.0	----	----	----	432.0	2032.0
76	1100.0	1697.0	2797.0	595.0	----	----	----	3392.0
77	1667.0	2778.0	4445.0	595.0	294.0	600.0	----	5934.0
78	----	4872.0	4872.0	595.0	294.0	----	----	5761.0
79	200.0	6842.0	7042.0	595.0	1317.0	----	----	8954.0
80	100.0	7128.0	7228.0	595.0	1495.0	----	----	9318.0
81	100.0	6980.0	7080.0	595.0	1465.0	----	----	9140.0

¹Monies were appropriated under Sections 110 and 114 only.²Includes \$250k one-time reprogramming from Administrator's Reserve.

Table 12

DEPARTMENT OF COMMERCE

ESTIMATED MARINE MAMMAL PROTECTION ACT (MMPA) EXPENDITURES
BY PROGRAM ACTIVITY FOR FISCAL YEARS 1976 - 1981

(in thousands of dollars)

	FY 76	FY 77	FY 78	FY 79	FY 80	FY 81
Program Administration	238.5	338.5	370.7	554.7	430.6	440.3
Enforcement	1063.0	925.7	1010.8	1111.9	1074.8	1082.1
Tuna-Porpoise Research & Management	836.9	2486.9	2846.2	3328.6	3511.6	3562.1
Cetacean & Pinniped Research	251.8	157.8	95.6	1406.4	1461.2	1069.0
General Support	<u>406.8</u>	<u>536.1</u>	<u>548.7</u>	<u>640.4</u>	<u>749.8</u>	<u>926.5</u>
<u>Total MMPA Appropriations</u>	2797.0	4445.0	4872.0	7042.0	7228.0	7080.0

Note: Figures do not reflect additional funding available for marine mammal activities under the Endangered Species Act and Fur Seal Act appropriations.

Table 13

INTERNATIONAL WHALING COMMERCIAL QUOTAS, 1975-80 1/

	25th Meeting (1973)	26th Meeting (1974)	27th Meeting (1975)	28th Meeting (1976)	29th Meeting (1977)	30th Meeting (1978)	31st Meeting (1979)	32nd Meeting (1980)
<u>Southern Hemisphere</u>								
Fin	1,450 2/	1,000 2/	220 2/	0	0	0	0	0
Minke	5,000 2/	7,000 2/	6,810	8,900	5,690	6,221	8,102	7,072
Sei	4,500 2/	4,000 2/	2,230	1,863	771	0	0	0
Sperm (male)	8,000	8,000	5,370	3,894	4,538	3,820	} 580	} 300
(female)	5,000	5,000	4,870	897	1,370	1,055		
Bryde's	0	0	0	0	0	0	264	886 3/
<u>North Pacific</u>								
Fin	550	300	0	0	0	0	0	0
Minke	.....	.....	.....	541	400	400	1,361	1,361
Sei and Bryde's	3,000	2,000	.....	.....	.....	.....	.....	.....
Sei	.....	.....	0	0	0	0	0	0
Bryde's	.....	.....	1,363	1,000	524	454	479	529
Sperm (male)	6,000	6,000	5,200	4,320	5,105	3,800 4/	1,350 4/	890 4/
(female)	4,000	4,000	3,100	2,880	1,339	.....	.....	.....
<u>North Atlantic</u>								
Fin	.....	.....	365	455	459	455	604	701 5/
Minke	.....	.....	2,550	2,483	2,555	2,552	2,543	2,554
Sei	.....	.....	.....	132	84	84	100	100
Sperm	.....	.....	.....	685	685	685	273	130 6/
TOTAL COMMERCIAL QUOTAS	37,500	37,300	32,578	28,050	23,520	19,526	15,656	14,523
Other 7/	8,173	5,173	1,358	.....	.....	.....	.....	.....
TOTAL	45,673	42,473	33,936	28,050	23,520	19,526	15,656	14,523 (13,851)8/

1/ Quotas established at the IWC annual meeting are for Antarctic whaling season (December of year of meeting through April of following year) and all coastal seasons of year after meeting. The Commission decided at the 32nd Meeting to apply quotas to whaling seasons in the year in which they begin.

2/ Catch limit covering Antarctic catch only (South of 40 Latitude).

3/ Of this figure, 622 whales cannot be taken legally by member countries because of the factory ship moratorium and/or the Indian Ocean Sanctuary.

4/ This figure includes a permissible bycatch of up to 11.5 percent females. Once the quota in males and females or 11.5 percent of the quota in females has been taken, whichever occurs first, all whaling for sperm whales in the North Pacific must cease.

5/ Of this figure, the Government of Iceland has stated its intention not to take 50 of the 304 whales permitted to be taken from the E. Greenland-Iceland stock. This figure also includes a limit of 240 for the Spain-Portugal-British Isles stock for which the 32nd Meeting set a 1980-1981 combined limit of 440 with a maximum annual limit of 240. The limit originally set for 1980 and reflected in the column for the 31st Meeting was 143.

6/ This figure is for males, and there is a zero quota for females.

7/ Whales taken by IWC nations, but not included in quotas.

8/ The figure in parentheses takes into account the reductions discussed in footnotes 3 and 5 above.

Appendix B

Laws and Treaties Governing the Protection of Marine Mammals

Every marine mammal of U.S. concern is protected by one or more U.S. laws or acts, and the conservation of some species is partially assured by international treaty or law. A summary of laws, conventions, and commissions designed to protect marine mammals follows.

United States Laws and Treaties

1. Marine Mammal Protection Act of 1972: A U.S. Federal law that prohibits persons under the jurisdiction of the United States from taking, harassing, or importing any marine mammal or its byproducts into the United States, except when authorized to do so by special permit. Eskimos, Aleuts, and Indians of the North Pacific and Arctic Oceans can take marine mammals for subsistence and for creating and selling handicraft items and clothing as long as the stocks can support the harvest.

2. Endangered Species Act of 1973: This U.S. Federal law provides a program for the conservation of species that are either endangered now or threatened with extinction within the foreseeable future and their dependent ecosystems, and to implement international conservation conventions. With limited exceptions, the Act prohibits the taking, importing, exporting, and interstate commerce of any endangered species, as well as their parts or products. Exceptions include: permits for scientific purposes or the enhancement of propagation or survival of the species, economic hardship exemptions, and subsistence taking by Alaska natives. For threatened species, the Act authorizes the issuance of protective regulations as necessary for their conservation. To accomplish its purposes, the Act authorizes the acquisition of land; authorizes cooperative agreements with States which have an adequate conservation program, including Federal funding of up to two-thirds (or three-fourths when entered with more than one State); prohibits Federal agencies from taking any action that would jeopardize the continued existence of an endangered or threatened species or result in the destruction or modification of its critical habitat unless an exception is granted by the Endangered Species Committee; requires the development of recovery plans; and provides for civil and criminal penalties. Marine mammals under the jurisdiction of NMFS and listed as endangered species are the blue whale, bowhead whale, fin whale, gray whale, humpback whale, right whales, sei whale, sperm whale, Caribbean monk seal, Hawaiian monk seal, and Mediterranean monk seal.

3. Convention on International Trade in Endangered Species of Wild Fauna and Flora: The Convention, which entered into force on July 1, 1975, provides additional protection for the following marine mammals

under the jurisdiction of MMFS: Appendix I--blue whale, bowhead whale, gray whale, humpback whale, right whales, certain stocks of fin and sei whales, Ganges River dolphin, humpbacked dolphin, Indus River dolphin, white flag dolphin, finless porpoise, cochito (porpoise), Caribbean monk seal, Hawaiian monk seal, Mediterranean monk seal, and northern elephant seal; Appendix II--certain stocks of fin and sei whales, and all other cetaceans, southern elephant seal, Amsterdam Island fur seal, Galapagos fur seal, Guadalupe fur seal, Juan Fernandez fur seal, Kerguelen fur seal, New Zealand fur seal, Southern (South American) fur seal, and South African fur seal. Trade is more strictly controlled for Appendix I animals than for Appendix II animals. The U.S. Management Authority for the Convention (U.S. Department of the Interior) controls the import, export, re-export, and introduction from the sea of convention animals through a system of permits and enforcement. Implementation by regulating commerce began May 23, 1977.

4. International Whaling Convention: The IWC was established under a convention signed in Washington, D.C., in December 1946. The membership includes all countries that catch significant numbers of whales except Chile, Peru, Portugal, and Spain. The IWC is responsible for whale conservation worldwide. Since 1964, the IWC has acted to bring world whaling under control by prohibiting the taking of some species, sharply reducing the authorized catches of species in certain areas, establishing catch quotas by species and stocks, and implementing an international observer plan for checking compliance with quotas and regulations at land stations and on factoryships. The IWC now regulates the harvest of Bryde's, fin, minke, sei, and sperm whales. An IWC subcommittee has been established to review problems relating to cetaceans. The blue, bowhead, gray, humpback, and right whales are completely protected, except for some hunting by aborigines.

5. Whaling Convention of 1949 brought into force the International Convention for the Regulation of Whaling signed on December 2, 1946, by the United States and certain other governments. Article III of the International Convention established the IWC.

6. The Whale Conservation and Protection Study Act of 1976: The Act requires the Secretary of Commerce to make a comprehensive study of all whales found in waters subject to the jurisdiction of the United States, including the 200-mile fishery conservation zone.

7. Interim Convention on North Pacific Fur Seals: The convention, ratified in 1957, prohibits most citizens of Canada, Japan, the U.S.S.R., and United States from taking northern fur seals. The exceptions are aboriginal Eskimos, Aleuts, and Indians, who may take them only at sea and by primitive methods. The convention also provides for intensive research on this species by the four countries. The United States and U.S.S.R. commercially harvest northern fur seals on their breeding grounds and regulate the kills on a scientific basis.

8. Fur Seal Act of 1966 brought into force the Interim Convention on North Pacific Fur Seals.

9. International Convention for the Conservation of Antarctic Seals, 1972: The purpose of this convention is to safeguard all species of Antarctic seals and to ensure that, if commercial sealing begins on floating ice of the Southern Ocean, the taking of any species will be subject to strict limitations to prevent overexploitation or damage to their ecosystem. Measures adopted under the Antarctic Treaty of 1959 provide only for the protection of seals and other animals around the shoreline of the Antarctic Continent, but not on floating ice. The convention of 1972 may be applicable to crabeater, leopard, Ross, southern elephant, southern fur seals, and Weddell seals south of latitude 60° south. The Ross, southern elephant, and southern fur seals are protected species, and no taking is permitted.

Miscellaneous Regulations and Agreements of U.S. Interest

1. International Convention for the Northwest Atlantic Fisheries: Under terms of a convention signed in 1949, ICNAF is responsible for the investigation, protection, and conservation of the fisheries of the Northwest Atlantic. On January 1, 1977, Canada extended its jurisdiction over fisheries to 200 miles. To avoid conflicts in 1977 between Canadian and international regulations, Canada agreed to adopt ICNAF regulations for the 1978 harvest of harp seals and hooded seals.

An amendment to the ICNAF Convention adopted in December 1976 allows the Commission to give scientific advice for management of fisheries within natural fishery limits if requested by a coastal state that is a party to the Convention.

A panel of ICNAF scientists recommended a kill of 180,000 harp seals for the entire northwest Atlantic for 1979. Canada appears to have completed the transition from international to Canadian management of harp and hooded seals within the limits of Canadian fisheries jurisdiction. The United States withdrew from the ICNAF in December 1976 to conform with provisions in the Fishery Conservation and Management Act.

2. Canadian Norwegian Agreement on Sealing: On December 22, 1971, these two governments ratified an agreement on sealing and the conservation of seal stocks in the Northwest Atlantic. The agreement applies to the harp seal, but provision is made for extension to hooded and bearded seals and to the walrus.

3. Harp Seal: The U.S.S.R. and Norway signed an agreement in 1958 entitled "Preservation of Seals in the Greenland Sea." The agreement provides for the regulation of harp seal catches by these two nations. The U.S.S.R., however, has not hunted harp seals since 1965.

4. Gray Seal: The U.S.S.R. has prohibited (since 1970) the hunting of gray seals for sport and by amateurs, but permits the taking of these animals for subsistence. Canada uses an 1886 law for authority in regulating the take of gray seals. England has prohibited the hunting of gray seals on the Farne Islands since 1932 and on Orkney Island since 1923. Norway has forbidden hunting at Sor Trondelag since 1923. Finland and Sweden offer bonuses for gray seals taken.

5. Hooded Seal: Canada and Norway prohibit the taking of hooded seals near Newfoundland before March 10, near Jan Mayen Island before March 13, in Denmark Strait from June 15 to July 15, and in northern waters from March 20 to May 5. The U.S.S.R. and Norway in 1958 agreed to prohibit the harvest of hooded seals near Jan Mayen Island before March 13 and banned hunting in Denmark Strait.

6. U.S.S.R. Regulations (from the Russian Publication, "Rules for Protecting and Harvesting Marine Mammals," July 11, 1975:

a. Under these regulations, a series of protective and conservation measures were adopted. Sport and hobby (recreational) hunting of any marine mammal is prohibited everywhere and throughout the year. Rookeries and hauling grounds are protected. Capture by use of poisons, certain firearms, and hook and line gear is prohibited at sea as well as fishing or harassment by vessels or aircraft within certain distances of various islands inhabited by marine mammals. The regulations include other prohibitions designed to protect marine mammals and their ecosystems.

b. The U.S.S.R. has established closed seasons on vessel and shore harvest of ribbon, ringed, and harbor seals (and the ice-dwelling form of the harbor seal, the largha seal). The regulations allow short periods of harvest of white coats, yearlings, and adults in the Okhotsk and Bering Seas. Short harvest periods are allowed in the northern commercial areas (White, Barents, and eastern Arctic Sea areas) on harp,

hooded, and ringed seals. The harvests in the Jan Mayen area are adjusted by international agreement. Taking of bearded seals and belukhas (white whales) is allowed in Arctic areas primarily for subsistence purposes.

7. Guadalupe fur seal: Mexico has safeguarded the breeding grounds of the Guadalupe fur seal on the Guadalupe Islands by making this island a wildlife refuge.

8. South American fur seal: The Uruguayan and Argentinian Governments protect the South American fur seal on land and out to 200 miles at sea. The Uruguayan Government also regulates the harvest by protecting all female seals except the 1 year olds, controlling take of pups by seasonal restrictions, and imposing quotas in some instances.

9. South African fur seal: The harvest of South African fur seals is largely a state enterprise in South Africa; however, the system includes one of control and leasing of rookeries to private contractors. The South West African Administration has not entered the harvesting business, but licenses private firms, restricts gear to be used, establishes closed seasons, and places limits on sex and condition of catch.

10. Narwhal: Canada allows Eskimos to take five narwhals annually for personal use and issues permits to capture this mammal for exhibition.

11. Killer whale: Canada allows this species to be taken under a permit system.

Appendix C

Notices and Regulations

Final rules and regulations are reprinted each year in the Code of Federal Regulations (CFR). Copies of the following rules, regulations, and notices published in the FEDERAL REGISTER are available from the Office of Marine Mammals and Endangered Species, National Marine Fisheries Service, U.S. Department of Commerce, Washington, D.C. 20235.

1. Bowhead Whale

45 FR 93 (May 12, 1980) - Notice of reassignment of a bowhead whale struck quota for calendar year 1980.

45 FR 108 (June 3, 1980) - Rules and Regulations - notice of closing the bowhead whaling season.

46 FR 11 (January 16, 1981) - Proposed rules on the taking of bowhead whales by Indians, Aleuts, or Eskimos for subsistence purposes for calendar years 1981, 1982, and 1983.

2. Hawaiian monk seal

45 FR 66 (April 3, 1980) - Notice of public meeting on proposed designation of critical habitat and availability of a draft environmental impact statement.

3. Incidental take of marine mammals

45 FR 76 (April 17, 1980) - Notice of availability of a report of a Workshop on stock assessment and incidental take of marine mammals.

45 FR 72 (April 11, 1980) - Notice of issuance of general permits to incidentally take marine mammals.

45 FR 87 (May 2, 1980) - Proposed Rules - taking of marine mammals incidental to commercial fishing operations.

45 FR 239 (December 10, 1980) - Notice of issuance of general permits to the Pacific Coast Federation of Fishermen's Association to take marine mammals incidental to commercial fishing operations in Categories 1, 3, 4, and 5. Valid through December 31, 1981.

46 FR 24 (February 5, 1981) - Notice of determination that the Government of Mexico is no longer in conformance with U.S. marine mammal regulations. Mexico is not allowed to export yellowfin tuna or tuna products into the United States.

4. Incidental take of porpoise in tuna purse seine fishery

45 FR 147 (July 29, 1980) - Proposed Rules - Notice of availability of recommended decision on the taking of marine mammals incidental to commercial fishing operations.

45 FR 150 (August 1, 1980) - Proposed Rules - Extension of time for filing exemptions to the above recommended decision.

45 FR 213 (October 31, 1980) - Final decision and final rule to establish regulations to govern the taking of marine mammals incidental to commercial tuna purse seine fishing in the ETP for each of the 5 years 1981-1985.

45 FR 237 (December 8, 1980) - Notice of issuance of a general permit to take marine mammals incidental to commercial fishing operations under category 2: encircling gear, purse seining involving the intentional take of marine mammals.

46 FR 5 (January 8, 1981) - Advance notice of proposed rulemaking: enforcement policy relating to sundown sets.

5. Dall's porpoise

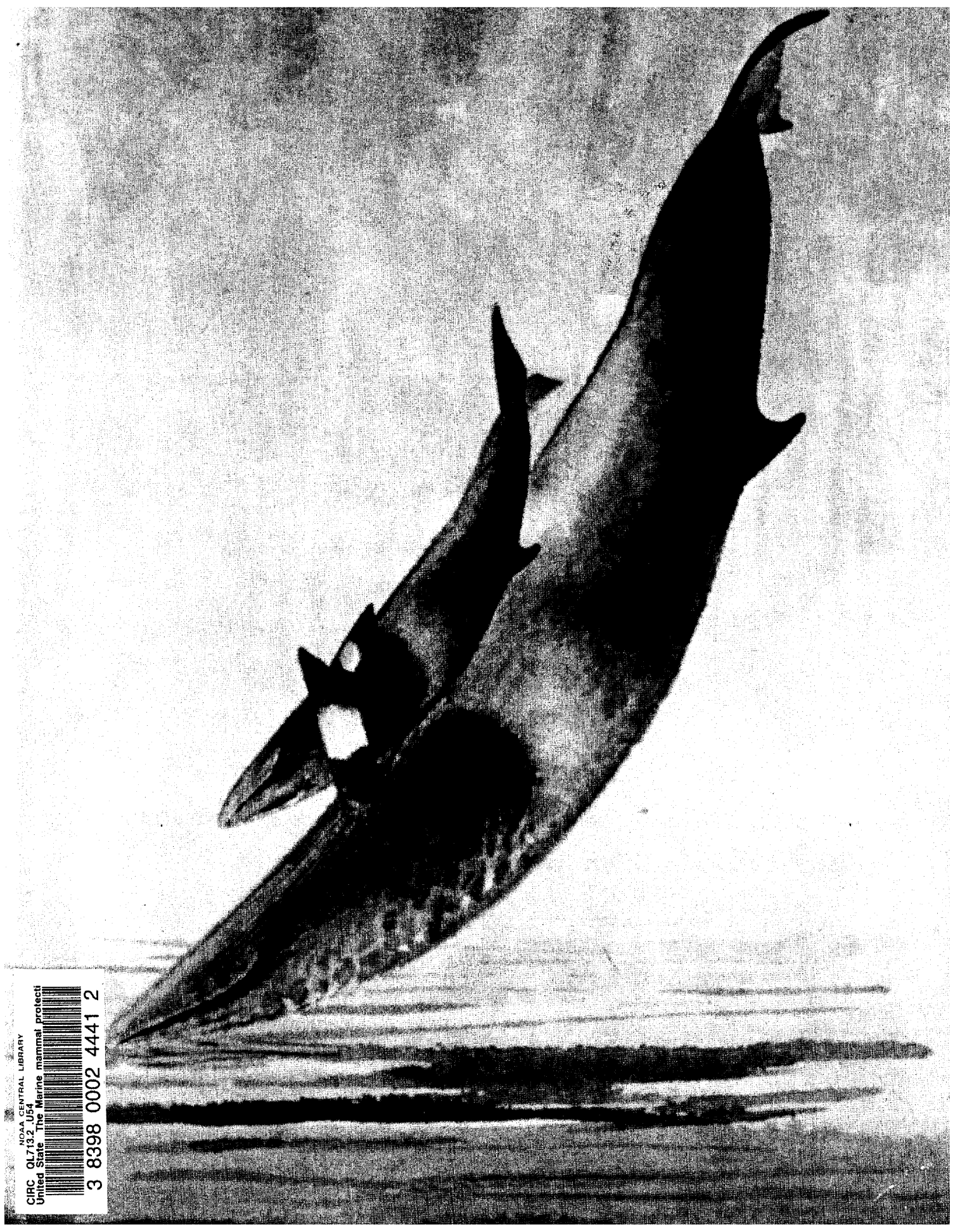
45 FR 227 (November 21, 1980) - Notice of intent to prepare an environmental impact statement on the incidental take of Dall's porpoise in the Japanese salmon fishery.

46 FR 23 (February 4, 1981) - Notice of receipt of permit application; notice of formal hearing; notice of formal hearing procedures; notice of proposed regulations concerning the incidental take of Dall's porpoise and other marine mammals in the Japanese high seas salmon gillnet fishery inside the FCZ.

6. Miscellaneous

45 FR 186 (September 23, 1980) - Rules and Regulations - Removal of final rule - A waiver of the Marine Mammal Protection Act by National Marine Fisheries Service concerning the importation of Cape fur seals harvested in South Africa was rendered invalid by decision of the D.C. Court of Appeals in Animal Welfare Institute vs. Kreps. National Marine Fisheries Service amended 50 CFR Part 216 by deletion of the regulations that sanctioned the waiver.

45 FR 249 (December 24, 1980) - Final rule - Publication of the schedule of the International Convention for the Regulation of Whaling as adopted at the July 1980 annual meeting of the IWC.



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