Marine Mammal Protection Act of 1972
Annual Report

January 1, 1998 to December 31, 1998

Prepared by

U.S. DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

National Marine Fisheries Service

Office of Protected Resources

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Editor: Nicole R. Le Boeuf

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, MD 20910

THE DIRECTOR

APR 11 2000

The Honorable John McCain
Chairman, Committee on Commerce,
Science, and Transportation
United States Senate
Washington, D.C. 20510

Dear Chairman McCain:

I am pleased to submit to you the National Marine Fisheries Service (NMFS) Annual Report regarding the administration of the Marine Mammal Protection Act (MMPA) from January 1, 1998 to December 31, 1998, as required by section 103 (f) of the MMPA. The report addresses the conservation, management, and research activities conducted by NMFS for the benefit of marine mammals, including whales, dolphins, and porpoise of the order Cetacea and seals and sea lions of the suborder Pinnipedia.

Sincerely,

for Penelope D. Dalton

Enclosure

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, MD 20910

THE DIRECTOR

APR 11 2000

The Honorable Don Young
Chairman, Committee on Resources
House of Representatives
Washington, D.C. 20515

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Chapter I. Introduction

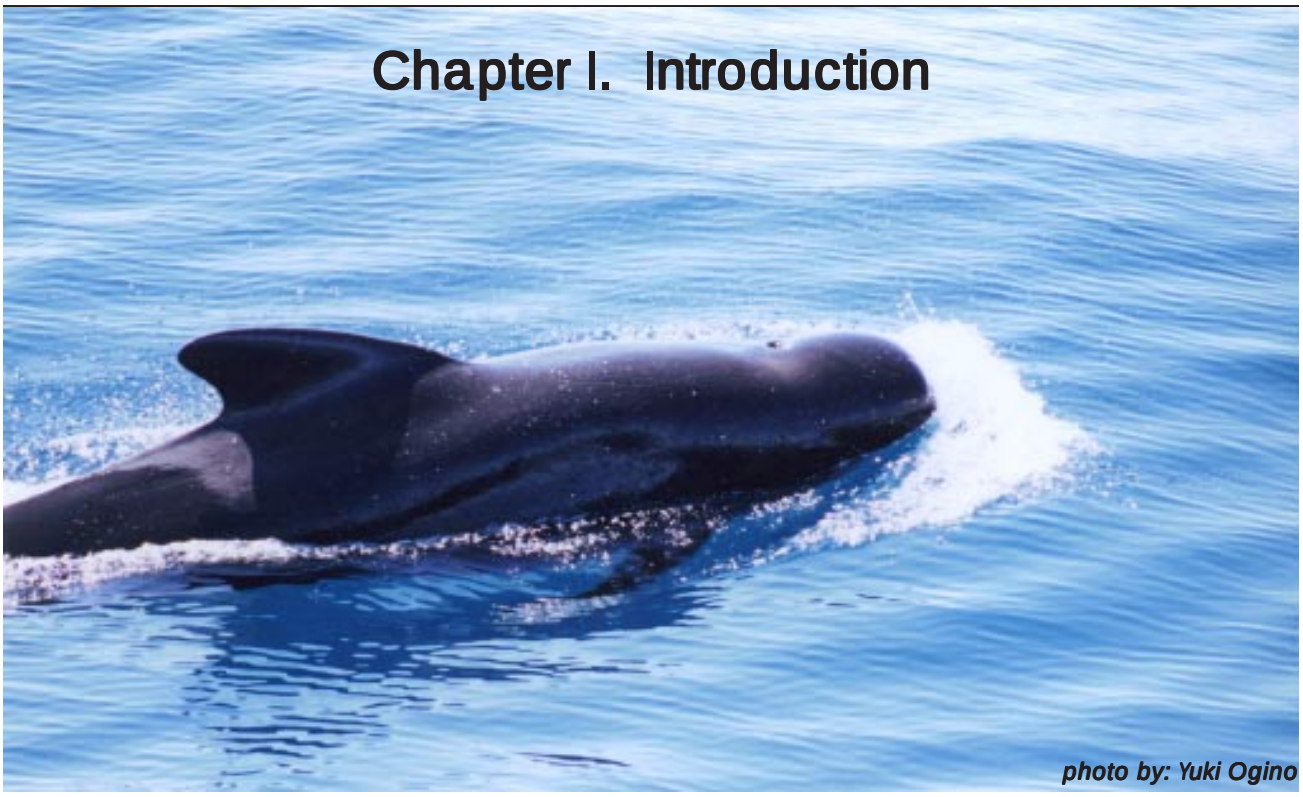


photo by: Yuki Ogino

This Annual Report to Congress regarding the administration of the Marine Mammal Protection Act (MMPA) has been prepared by the National Marine Fisheries Service (NMFS) pursuant to sections 103(f), 104(h)(3)(C), 110(d), and 115(b)(3) of the MMPA.

The MMPA is the principal federal legislation that guides marine mammal species protection and conservation policy in the United States. The MMPA vests responsibility for most marine mammals in the Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS). Under the MMPA, NMFS is responsible for the management and conservation of 153 stocks of whales, dolphins, and porpoises as well as seals, sea lions, and fur seals. The U.S. Fish and Wildlife (FWS) is responsible for three species of marine mammals: walrus, sea otter, and West Indian manatee.

Species conservation activities are carried out by NMFS' Headquarters, Regional Offices, and Fisheries Science Centers in cooperation with states, conservation groups, the public, the Marine Mammal Commission, other federal agencies, and other constituents including scientific researchers, the fishing industry, and the marine mammal public display community. The NMFS' Office of Protected Resources oversees the administration of these activities.

The MMPA was enacted in 1972 largely due to public response to the high levels of dolphin mortality in the Eastern Tropical Pacific Ocean tuna purse seine fishery as well as to concerns over commercial whaling and the killing of harp seals for the fur trade. Since then, many issues have changed, but the need to conserve and protect marine mammals remains.

Section 2(6) of the MMPA states that,

> *""...marine mammals have proven themselves to be resources of great international significance, esthetic and recreational as well as economic...and...it is the sense of Congress that they [marine mammals] should be protected and encouraged to develop to the greatest extent feasible commensurate with sound policies of resource management and that the primary objectives of their management should be to maintain the health and stability of the marine ecosystem."*

On April 30, 1994, the MMPA was reauthorized and significantly amended. The MMPA Amendments of 1994 introduced substantial changes to the provisions of the MMPA. One of the most notable changes involved replacing the Interim Exemption for Commercial Fisheries with a long-term regime for governing interactions between marine mammals and commercial fisheries under sections 117 and 118. This regime provides for the preparation of stock assessment reports for all marine mammal stocks in U.S. waters and the development and implementation of take reduction plans to reduce bycatch of selected "strategic" marine mammal stocks, as defined in the MMPA. Other changes included a requirement to study pinniped-fishery interactions, provisions related to captive marine mammals, provisions regarding the taking of marine mammals listed under the Endangered Species Act (ESA), and a new section providing for marine mammal cooperative agreements in Alaska.

Numerous countries look toward the MMPA and its implementing regulations for guidance on marine mammal conservation issues and have established laws and policies patterned after the MMPA. Here in the United States, we have only begun to quantify the MMPA's effect on marine mammal stocks. However, some tangible results can be recognized. One species of marine mammal, the endangered gray whale, has recovered so well that it has been removed from the ESA's List of Endangered and Threatened Wildlife.

The success in recovery of stocks such as the California sea lion and the Pacific harbor seal has resulted in the escalation of conflicts with various human activities. Their numbers and the continually increasing use of coastal resources by people have increased the number of and intensity of interactions between the two. These complicated situations create difficult management decisions that must be evaluated within the overarching principles of ecosystem management and the goals of the MMPA.

On the opposite end of the spectrum, there are far more species that have not recovered, despite the efforts of managers to reverse their population declines. Despite considerable, often exhaustive, and focused conservation efforts, some species remain critically endangered. Among these are the Hawaiian monk seal *(Monachus schauinslandi)* and northern right whale *(Eubalaena glacialis)*, for which recovery efforts have included scientific research and the reduction of human-caused injury and mortality, among numerous other conservation and management actions. Still, the future of these species is uncertain.

The lack of success and difficulty in recovering listed species and stocks is particularly perplexing and frustrating where the primary threats to the population are not fully understood. The western stock of Steller sea lion in Alaska has dramatically diminished in numbers since the 1970s and continues to do so. Although they have been the focus of intensive research, there is still some uncertainty as to why their populations are declining.

This report addresses in more detail many of these issues, primarily focusing on research, management, and permitting activities conducted by NMFS in 1998 and the significance of these activities to achieving the goals of the MMPA. Copies of this report are available from the NMFS Office of Protected Resources. See Appendix F for this address as well as those of the NMFS Regional Offices and Fisheries Science Centers.

Chapter II. Marine Mammal Stock Assessment Program

photo by: P. Michael Payne, NMFS

Sections 117 and 118 of the Marine Mammal Protection Act (MMPA) establish a long-term regime for governing interactions between marine mammals and commercial fishing operations. These sections direct NMFS to complete Stock Assessment Reports (SARs), to convene Scientific Review Groups (SRGs), to publish the List of Fisheries (LOF), to convene take reduction teams in order to form take reduction plans, and to meet both short- and long-term goals for reducing incidental takes of marine mammals. These are all components of a comprehensive program designed to reduce interactions between marine mammals and commercial fishing operations.

The formation of a take reduction team to reduce interactions between marine mammals and commercial fisheries is dependent on a fishery's classification in the LOF and whether its status is strategic according to the SAR. In addition, the SARs provide much of the data used during the development of the take reduction plans. The results of observer programs, which are used to collect data on the level of incidental mortality and serious injury in Category I and II fisheries, are presented in the SARs. As NMFS begins to implement take reduction plans in order to meet the short- and long-term goals of the MMPA, recommendations and comments from the SRGs will continue to play a critical role as NMFS monitors fisheries to ensure that incidental marine mammal mortalities and serious injuries decline over time to insignificant levels. For more information on programs for reducing interactions between marine mammals and commercial fisheries, see Ch. III: Reducing Interactions Between Marine Mammals and Commercial Fisheries.

Section 117 of the MMPA requires the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (FWS) to prepare and periodically update marine mammal stock assessment reports. The Stock Assessment Reports indicate whether the status of a marine mammal stock is considered "strategic" and provide much of the data NMFS uses to classify fisheries under section 118 in the LOF.

Section 117 (a)(1) states that NMFS shall:

"... prepare a draft stock assessment for each marine mammal stock which occurs in waters under the jurisdiction of the United States. Each draft stock assessment,

based on the best scientific information available, shall -

1) describe the geographic range of the affected stock, including any seasonal or temporal variation in such range;

2) provide for such stock the minimum population estimate, current and maximum net productivity rates, and current population trend, including a description of the information upon which these are based;

3) estimate the annual human-caused mortality and serious injury of the stock by source and, for a strategic stock, other factors that may be causing a decline or impeding recovery of the stock, including effects on marine mammal habitat and prey;

4) describe commercial fisheries that interact with the stock, including -

a) the approximate number of vessels actively participating in each such fishery;

b) the estimated level of incidental mortality and serious injury of the stock by such fishery on an annual basis;

c) seasonal or areal differences in such incidental mortality and serious injury;

d) the rate, based on the appropriate standard unit of fishing effort, of such incidental mortality and serious injury, and an analysis stating whether such level is insignificant and is approaching a zero mortality and serious injury rate;

5) categorize the status of the stock as one that either -

a) has a level of human-caused mortality and serious injury that is not likely to cause the stock to be reduced below its optimum sustainable population; or

b) is a strategic stock, with a description of the reasons therefore; and

The 1998 Stock Assessment Reports

Alaska: Hill, P.S. and D.P. DeMaster. 1998. Alaska Marine Mammal Stock Assessments, 1998. NOAA Technical Memorandum NMFS-AFSC-97, 166 pp.

Pacific: Barlow, P., P.S. Hill, K. Forney, and D. P. DeMaster. 1998. U.S. Pacific Marine Mammal Stock Assessments: 1998. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SWFSC-258, 40 pp.

6) estimate the potential biological removal level for the stock, describing the information used to calculate it, including the recovery factor."

The Scientific Review Groups

Section 117 of the MMPA Amendments of 1994 called for the establishment of three regional Scientific Review Groups (SRGs) representing Alaska, the Pacific Coast (including Hawaii), and the Atlantic Coast (including the Gulf of Mexico). The SRGs were required to be created under the direction of the Secretary of Commerce in consultation with the Secretary of the Interior, the Marine Mammal Commission, the Governors of affected adjacent coastal States, regional fishery and wildlife management authorities, Alaska Native organizations and Indian tribes, and environmental and fishery groups. The SRGs review draft stock assessments and advise NMFS concerning marine mammal population status, trends, stock identity, and dynamics; uncertainty and research needed on the marine mammal stocks and research needed to identify methods to reduce incidental mortality and injury; impacts of habitat degradation and appropriate measures to reduce impacts; and any other issue NMFS or the groups consider appropriate in pursuing the goals of the MMPA. SRG members are required to have expertise in marine mammal biology and ecology, population dynamics and modeling, commercial fishing techniques and practices, or stocks under section 101(b) in order to provide balanced and representative viewpoints in their discussions.

The three SRGs were formed in 1994 with approximately eleven members each. These groups are convened and organized out of each of the following NMFS Fisheries

Science Centers: Alaska, Southwest, and Northeast/ Southeast.

A total of six SRG meetings were held during 1998 (Figure 1). In these meetings, the SRGs reviewed new marine mammal stock data and information and provided NMFS with recommendations for future research. The SRGs reviewed the revised 1998 draft stock assessment reports and are assisting NMFS in bringing these reports to a finished form.

Figure 1. SRG Meetings Held in 1998

Atlantic SRG
May 20-22, 1998
November 12-13, 1998

Alaska SRG
June 2-4, 1998
November 18-20, 1998

Pacific SRG
March 30-April 1, 1998
November 16-18, 1998

Marine Mammal Stock Assessment Reports

The MMPA requires NMFS and FWS to review the stock assessment reports annually for strategic stocks of marine mammals and every three years for stocks determined to be non-strategic consistent with any new information. In 1998, NMFS revised those reports for which significant new information was available (relative to the 1996 stock assessment reports published in 1997). The Draft 1998 Stock Assessment Reports were published in July of 1998 in three separate documents. NMFS expects to publish the Final 1998 Stock Assessment Reports in February 1999.

The Draft 1998 Stock Assessment Reports

In 1998, NMFS, in conjunction with the regional SRGs, reviewed the MMPA status of the Alaska, Pacific, and Atlantic stocks and revised those reports for which significant new information was available.

Draft 1998 Alaska Stock Assessment Report

NMFS, in conjunction with the Alaska Scientific Review Group, reviewed new information available for all strategic stocks of Alaska marine mammals under its authority, as well as for several other stocks. A total of 15 of the 33 Alaska stock assessment reports were revised for 1998. Most proposed changes to the stock assessment reports incorporated new information into abundance or mortality estimates. The revised stock assessments included all ten of the strategic stocks: western U.S. Steller sea lion, eastern U.S. Steller sea lion, northern fur seal, Cook Inlet beluga whale, North Pacific sperm whale, western North Pacific humpback whale, central North Pacific humpback whale, northeast Pacific fin whale, North Pacific right whale, and western Arctic bowhead whale. Additionally, five reports of non-strategic stocks were revised: Gulf of Alaska harbor seals, Bering Sea harbor seals, Southeast Alaska harbor seals, eastern North Pacific transient killer whales, and North Pacific resident killer whales (eastern North Pacific transient and Northern resident stocks). The new information on abundance and mortality did not change the status (strategic or not) of any of these 15 Alaska stocks.

Fishery mortality sections in the revised Alaska reports were updated to include data from observer programs, fisher self-reporting, and stranding reports through 1996, where possible. Similarly, subsistence harvest information through 1996 was included for those stocks that are taken by Alaska Natives for subsistence purposes (see Chapter VIII. Native Take of Marine Mammals and International Activities). New abundance estimates were included in the revised assessments for nine stocks: western U.S. Steller sea lions, eastern U.S. Steller sea lions, northern fur seals, Cook Inlet beluga whales, western North Pacific humpback whales, central North Pacific humpback whales, Gulf of Alaska harbor seals, and eastern North Pacific transient killer whales, and North Pacific resident killer whales. Revised Potential Biological Removal (PBR) levels were calculated for all Alaska stocks having new abundance estimates. Additionally, habitat concerns were identified for all strategic stocks.

Figure 1. 1996 marine mammal stock assessment reports: stocks with estimated annual human-caused mortality greater than PBR and designated as strategic.

Species	*Stock Area*	*PBR*	*Total Annual Mortality*	*Annual Fisheries Mortality*	*Primary Source of Mortality*
North Atlantic right whale	W. North Atlantic	0.4	2.5	1.1	Collisions with ships
Harbor porpoise	Gulf of Maine/Bay of Fundy	483	1,834	1,834	Northeast multispecies sink gillnet fishery
Common dolphin	W. North Atlantic	40	234	234	Atlantic large pelagics drift gillnet fishery
Atlantic spotted dolphin	W. North Atlantic	16	22	22	Atlantic large pelagics drift gillnet fishery
Pantropical spotted dolphin	W. North Atlantic	16	22	22	Atlantic large pelagics drift gillnet fishery
Cuvier's beaked whale	W. North Atlantic	8.9	9.7	9.7	Atlantic large pelagics drift gillnet fishery
Mesoplodont beaked whale	W. North Atlantic	8.9	9.7	9.7	Atlantic large pelagics drift gillnet fishery
Pilot whale, short-finned	W. North Atlantic	3.7	42	42	Atlantic large pelagics drift gillnet fishery
Bottlenose dolphin	W. North Atlantic, coastal	25	29	29	Undetermined fisheries interactions, suspected of being from mid-Atlantic coastal gillnet fishery
Pilot whale, short-finned	CA/ OR/WA	5.9	13	13	CA/OR thresher shark/swordfish drift gillnet fishery
Mesoplodont beaked whale	CA/OR/ WA	11	9.2-13	9.2-13	CA/OR thresher shark/swordfish drift gillnet fishery
Sperm whale	CA to WA	1.8	4.5	4.5	CA/OR thresher shark/swordfish drift gillnet fishery
Humpback whale	California/ Mexico	0.5	1.8	1.2	CA/OR thresher shark/swordfish drift gillnet fishery
Minke whale	CA/ OR/ WA	1.0	1.2	1.2	CA/OR thresher shark/swordfish drift gillnet fishery
Steller sea lion	Western U.S.	383	447	35	Subsistence harvest
Beluga	Cook Inlet	15	40	0	Subsistence harvest

Draft 1998 Pacific Stock Assessment Report

NMFS, in conjunction with the Pacific Scientific Review Group, reviewed new information on the MMPA status of all 50 stocks of marine mammals in the U.S. Pacific region (predominantly stocks along the coast of California, Oregon, Washington, and Hawaii) that are under its authority. NMFS found that the MMPA status of the California/Oregon/Washington stock of minke whales and the California/Oregon/Washington stock of mesoplodont beaked whales should be changed from "strategic" to "non-strategic", and these draft reports were revised accordingly. This change was prompted by the greater abundance of these species estimated from a 1996 ship survey that covered California and (for the first time) Oregon and Washington.

An additional five Pacific stock assessments were revised for 1998 to incorporate new information, including coastal Oregon/Washington harbor seal, inland Washington harbor seal, San Miguel Island northern fur seal, coastal Oregon/Washington harbor porpoise, and inland Washington harbor porpoise. The 1998 review of these additional stocks did not indicate that a change in the MMPA status was warranted.

Fishery mortality sections in the revised Pacific reports were updated to include data from observer programs, fisher self-reporting, and stranding reports through 1996, where possible. New abundance estimates were included in the revised assessments for the California/Oregon/Washington minke whale, the California/Oregon/Washington mesoplodont beaked whale, the coastal Oregon/Washington harbor seal, the inland Washington harbor seal, San Miguel Island northern fur seal, and the inland Washington harbor porpoise stocks. New PBR estimates were calculated for each stock having a revised abundance estimate.

Draft 1998 Atlantic Stock Assessment Report

NMFS, in conjunction with the Atlantic Scientific Review Group, reviewed new information available for all strategic stocks of Atlantic marine mammals under their authority, as well as for several other stocks. A total of 26 of the 57 Atlantic stock assessment reports were revised for 1998. Most proposed changes to the stock assessment reports incorporated new information into abundance or mortality estimates. The revised stock assessments included 14 of the strategic stocks: Gulf of Maine/

Bay of Fundy harbor porpoise, western North Atlantic common dolphin, western North Atlantic spotted dolphin, western North Atlantic pantropical spotted dolphin, western North Atlantic dwarf sperm whale, western North Atlantic pygmy sperm whale, western North Atlantic Cuvier's beaked whale, western North Atlantic mesoplodont beaked whale, western North Atlantic short-finned pilot whale, western North Atlantic sperm whale, North Atlantic humpback whale, western North Atlantic right whale, western North Atlantic fin whale, and western North Atlantic blue whale.

Additionally, 12 reports of non-strategic stocks were revised: western North Atlantic harbor seals, western North Atlantic gray seals, western North Atlantic harp seals, western North Atlantic hooded seals, western North Atlantic Risso's dolphin, western North Atlantic white-sided dolphin, western North Atlantic striped dolphin, western North Atlantic spinner dolphin, western North Atlantic Bottlenose dolphin (offshore), western North Atlantic Northern bottlenose whale, western North Atlantic long-finned pilot whale, and Canadian East Coast minke whale.

The new information on abundance and mortality changed the status (strategic or non-strategic) of three Atlantic stocks relative to the 1996 reports. NMFS found that the status of Atlantic white-sided dolphins and Atlantic long-finned pilot whales should be changed from non-strategic to strategic, and these draft reports were revised accordingly. This change was prompted by the (1992-1996) average annual mortality estimates. The review of all other marine mammal stocks and advice from the Atlantic Scientific Review Group indicated that the western North Atlantic pygmy sperm whale stock should be changed from strategic to non-strategic.

Fishery mortality sections in the revised Atlantic reports were updated to include data from observer programs and stranding reports through 1996, where possible. New abundance estimates were included in the revised assessments for four stocks (western North Atlantic harbor seals, western North Atlantic gray seals, western North Atlantic common dolphins, North Atlantic humpback whales, and Canadian East Coast minke whales). PBR levels were calculated for all Atlantic stocks having new abundance estimates and for western North Atlantic striped dolphins, for which the recovery factor was revised.

Chapter III.Reducing Interactions Between Marine Mammals and Commercial Fisheries

photo courtesy of: NMFS NEFSC

The Marine Mammal Protection Act (MMPA) was amended by Congress in 1994 to establish a long-term regime for governing interactions between marine mammals and commercial fisheries. The MMPA Amendments of 1994 established section 118, which contained the following goals: (1) reducing incidental mortality or serious injury of marine mammals occurring in the course of commercial fishing operations to below the Potential Biological Removal (PBR) level within six months of enactment and (2) further reducing these mortalities and serious injuries to insignificant levels approaching a zero mortality and serious injury rate within seven years. Final regulations implementing this program were published in 1995 after considerable public involvement and comment (60 FR 45086).

The Annual List of Fisheries

NMFS must classify all U.S. commercial fisheries into Category I, II or III, based on whether or not the fishery has a frequent, occasional, or a remote likelihood of causing incidental mortality and/or serious injury of marine mammals, respectively. NMFS defined Category I, II, and III fisheries based on the annual level of incidental mortality and serious injury of marine mammals relative to each stock's calculated PBR level.

Definitions of Category I, II, and III Commercial Fisheries

The fishery classification criteria consists of a two-tiered, stock-specific approach that first addresses the total impact of all fisheries on each marine mammal stock, and then addresses the impact of individual fisheries on each stock. NMFS uses the following decision process when assessing each fishery for which data are available:

Tier 1: Tier 1 considers the cumulative fishery mortality and serious injury for a particular stock. If the total annual mortality and serious injury across all fisheries that interact with a stock is less than or equal to 10% of the PBR level of that stock, then all fisheries interacting with this stock are placed in Category III. Otherwise, these fisheries are subject to Tier 2 standards.

Tier 2: Tier 2 considers fishery-specific mortality for a particular stock. Fisheries under Tier 2 fall into one of three categories.

Category I*: If the total annual mortality and serious injury of a stock in a given fishery is greater than or equal to 50 percent of the calculated PBR level of that stock, then the fishery is placed in Category I.*

Category II*: If the total annual mortality and serious injury of a stock in a given fishery is greater than 1 percent and less than 50 percent of the PBR level of that stock, then the fishery is placed in Category II.*

Category III*: If the total annual mortality and serious injury of a stock in a given fishery is less than or equal to 1 percent of the PBR level for that stock, then the fishery is placed in Category III.*

Information Used to Classify Commercial Fisheries

NMFS bases its classification of commercial fisheries on a variety of different types of information. The best source of information on the level of fishery-specific marine mammal incidental serious injury and mortality is a fishery observer program. Thus, if data from an observer program are available, NMFS will use this information to classify the fishery. However, because only some commercial fisheries have been monitored by observer programs, other information may also be used to classify fisheries.

If data from fishery observer programs are not available, NMFS may also use the following sources of information to classify fisheries: fishers' reports submitted as required under the Marine Mammal Authorization Program since 1996 (or logbook data from the Marine Mammal Exemption Program from required 1989 to 1995), stranding data, data from other monitoring programs that use alternate platforms such as aircraft and non-fishing vessels, and other sources of information.

Publication of the List of Fisheries

NMFS must publish an annual List of Fisheries (LOF). Proposed changes to the LOF for the following year are published in the spring or early summer. Public comments received during the 90-day comment period are considered when developing the final LOF, which is published during the late fall or early winter.

For each fishery, the LOF must include the number of vessels or participants in that fishery and list which marine mammal stocks or species interact with that fishery. Because the focus in the MMPA is on "injuries and mortalities" to marine mammals, any marine mammal species that has been injured or killed in a particular commercial fishery is included in the LOF.

Definitions of U.S. Commercial Fisheries in the List of Fisheries

Fisheries in the LOF are defined by the broad or specific geographic area in which they operate, the gear type used, the method used, and the target species. NMFS will, whenever possible, define fisheries in a manner which is consistent with federal, regional, and state fishery management plans or programs, in order to:

* reduce confusion caused by having multiple names for the same fishery;

* provide a "common name" for a fishery that can be used by NMFS, fishers, and state and regional fishery managers;

* allow NMFS to more easily collect information on fishery statistics, such as the number of participants, target species landed, length of fishing season, etc.; and

* help NMFS meet its statutory obligations by coordinating registration under the MMPA with existing fishery management programs.

In the future, NMFS may have sufficient information to subdivide certain commercial fisheries into components that have different levels of impact to marine mammal stocks. This approach may help NMFS focus management actions on certain "hot spots" where there are documented high impacts to marine mammal stocks. NMFS will continue to seek public comment on the optimum way to define commercial fisheries and will modify the LOF as necessary to reflect changes in U.S. fisheries.

The 1999 List of Fisheries

A proposed LOF for 1999 was published on August 11, 1998 (63 FR 42803). The final LOF for 1999 is expected to be published in February 1999. In the pro-

posed 1999 LOF, NMFS proposed several changes to the classification of fisheries, as well as technical revisions to the regulations implementing section 118 of the MMPA.

NMFS' proposed changes to the LOF include:

* adding the Atlantic herring midwater trawl fishery as a Category II fishery;

* removing the Category III listing for the Gulf of Maine, Mid-Atlantic coastal herring trawl fishery;

* incorporating participants in the Gulf of Maine, Mid-Atlantic coastal herring trawl fishery into the new Category II listing for the Atlantic herring midwater trawl fishery; and

* reclassifying the Gulf of Mexico menhaden purse seine fishery from Category III to Category II.

A table providing a list of all U.S. commercial fisheries was published in the *Federal Register* notice announcing the proposed LOF for 1999. A list of Category I and II fisheries can be found in Appendix A.

Monitoring Programs

One way that NMFS determines the impacts that U.S. commercial fisheries have on marine mammal stocks and places fisheries in the appropriate MMPA Category (I, II, or III) is through its fisheries observer programs. NMFS considers fishery observer programs to be the best source of information for the level of fishery-specific marine mammal incidental serious injury and mortality. The objectives of MMPA fisheries observer programs are to obtain statistically reliable estimates of incidental mortality and serious injury of marine mammals in commercial fisheries, to determine the reliability of fishers' reports, and to identify changes in fishing methods or technology that may decrease incidental marine mammal mortality and serious injury.

Seven of the 30 Category I and II fisheries were observed in 1998 for interactions with marine mammals:

Category I:
* Northeast multispecies sink gillnet fishery
* Atlantic Ocean/Caribbean/Gulf of Mexico large pelagics longline fishery
* Atlantic Ocean/Caribbean/Gulf of Mexico large pelagics drift gillnet fishery
* California/Oregon thresher shark/swordfish drift gillnet fishery

Category II:
* Mid-Atlantic coastal gillnet fishery
* Atlantic squid/mackerel/butterfish trawl fishery
* Southeastern U.S. Atlantic shark gillnet fishery

Observer data are summarized in the 1998 Stock Assessment Reports.

Observer Program Rotation Workshop

The MMPA requires that all U.S. commercial fisheries be categorized according to their level of marine mammal mortality and serious injury. However, the lack of information on the level of mortality/serious injury associated with the majority of the 24 Category II fisheries makes it difficult to verify whether the current categorization of these fisheries is correct.

A workshop to discuss the development of a process for the long-term monitoring of Category I and II commercial fisheries and to evaluate the utility of rotational scheduling in that process, was held on June 15-16, 1998. Rotational scheduling may free up limited funds to monitor many of the Category II fisheries that are not currently being observed. Workshop participants reviewed presentations describing the regulatory and funding environment for MMPA observer programs, statistical considerations in the design of monitoring programs, and alternative monitoring strategies. The discussions which followed these presentations considered the following issues: the structure and design of monitoring programs, classification of fisheries and their priority for observation, the utility of and design considerations for pilot observer programs, logistical barriers to rotational observer programs, sampling concerns at low coverage levels, and alternatives to traditional at-sea observer programs.

Workshop participants proposed a framework process for long-term fishery monitoring, in which all unobserved Category I and II fisheries would form the selection pool for future observer programs. A one-year pilot program may be considered if basic information about the fishery is required. This would be followed by a two- to three-year Operational Program, a (minimum) one-year Take Reduction Plan phase, a two- to three-year Compliance/ Monitoring phase, and a Long-Term Monitoring phase which would last for an indefinite period (until take reduction to insignificant levels approaching a zero mortality and serious injury rate, or the Zero Mortality Rate Goal, has been achieved). Rotational scheduling was deemed applicable only at the Long-Term Monitoring phase of this process. However, a rotational schedule was not proposed, since no fisheries currently being monitored are expected to reach that phase for two or three years.

There are already Category I and II fisheries at various stages in this process, and participants identified stages for each of these fisheries and viewed fisheries in the Take Reduction Plan phase as the agency's highest priority. They encouraged policy makers to consider unobserved Category II fisheries of equal priority with those in the Compliance/Monitoring phase, so the agency can begin to examine some fisheries with unknown take levels. Fisheries in the Long- Term Monitoring phase followed these in priority ranking. Participants began but were unable to complete prioritization and decision criteria for determining which unobserved fisheries are the first to be monitored. They recommended that NMFS: (1) task a small working group with developing these criteria for all stages in the monitoring process; (2) develop a draft schedule for observing fisheries based on funding projections and likely budget scenarios; and (3) identify options for alternative monitoring programs and determine when their use may be appropriate.

Registration Requirements for Commercial Fishers

Commercial fishers who participate in Category I or II fisheries in the LOF must register in the Marine Mammal Authorization Program (MMAP). Registration under the MMAP is administered by NMFS Regional Offices, and the registration procedures differ between NMFS Regions. Information on region-specific registration requirements for Category I and II fisheries will be published along with the final LOF for 1999 in the *Federal Register.*

The MMPA states that NMFS should, to the maximum extent practicable, integrate registration of participants in Category I or II fisheries under the MMPA with existing state or federal permit systems. Between 1995 and 1998, NMFS integrated registration in the MMAP with pre-existing state and federal fisheries permit systems for most fisheries in Category I and II. Over the past two years, these efforts have resulted in reduced paperwork for both NMFS and the estimated 22,500 commercial fishers that fall under the requirements of the MMAP, with the majority of these not needing to register separately under the MMAP or to pay the $25 federal registration fee.

In 1995, the NMFS Northwest Regional Office was the first NMFS office to successfully integrate registration under the MMPA. For fisheries in which the granting and administration of authorizations has not been integrated with state licensing, registration, or permitting systems, owners of vessels or gear must register with NMFS Region in which their fishery operates. NMFS Regional Offices annually send renewal packets to participants in Category I and II fisheries that have previously registered with NMFS; however, it is the responsibility of fishers to ensure that registration or renewal forms are submitted to NMFS at least 30 days in advance of fishing. If fishers have not received a renewal packet by January 1 or are registering for the first time, requests for registration forms should be sent to the appropriate NMFS Regional Office. Registrants must return the registration form and the $25 fee to the appropriate NMFS Regional Office. NMFS will send the vessel owner an Authorization Certificate, a program decal, and reporting forms within 30 days of receiving the registration or renewal form and application fee.

Reporting Requirements for Commercial Fishers

All vessel owners or operators or fishers (in the case of non-vessel fisheries) in Category I, II, or III fisheries must

report all mortalities or injuries of marine mammals that occur incidental to their commercial fishing operations. These reports of marine mammal mortality or injury are to be submitted on postage-paid forms provided by NMFS and sent to NMFS Headquarters in Silver Spring, Maryland.

In 1998, NMFS received 112 reports of injuries and/or mortalities from commercial fishing vessel operators. Appendix B summarizes self-reported injuries and mortalities by species and by fishery for 1998.

Take Reduction Teams and Take Reduction Plans

Requirements for the Development and Implementation of Take Reduction Plans

Section 118(f) of the MMPA requires that NMFS develop and implement take reduction plans designed to assist in the recovery or prevent the depletion of strategic marine mammal stocks that interact with Category I or II fisheries. (For a discussion of strategic stocks, see Chapter II.)

The immediate goal of a take reduction plan is to reduce, within six months of its implementation, the mortality and serious injury of strategic stocks incidentally taken in the course of commercial fishing operations to below the PBR levels established for those stocks. The long-term goal of a plan is to reduce, within five years of its implementation, the incidental mortality and serious injury of all marine mammals taken in commercial fishing operations to insignificant levels approaching a zero mortality and serious injury rate (ZMRG), taking into account the economics of the fishery, the available existing technology, and existing state or regional management plans. More information on the establishment of take reduction teams and implementation of take reduction plans can be found in the 1997 MMPA Annual Report.

NMFS initially formed five take reduction teams based on the high priority placed on certain strategic stocks for the development of take reduction plans to reduce incidental bycatch (see Table 1). Recognizing that insufficient resources existed for the development of take reduction plans for all stocks affected by commercial fisheries, NMFS followed the guidance in section 118(f)(3) in prioritizing the establishment of take reduction teams to address stocks of greatest concern. NMFS intends to establish additional take reduction teams in 2000 to address incidental takes of other strategic marine mammal stocks in commercial fisheries. The five initial teams were the:

* Pacific Offshore Cetacean Take Reduction Team,
* Atlantic Offshore Cetacean Take Reduction Team,
* Gulf of Maine Harbor Porpoise Take Reduction Team,
* Mid-Atlantic Take Reduction Team, and
* Atlantic Large Whale Take Reduction Team.

Gulf of Maine Harbor Porpoise Take Reduction Plan

NMFS established the Gulf of Maine Harbor Porpoise Take Reduction Team (HPTRT) on February 12, 1996, to address incidental takes of the Gulf of Maine/Bay of Fundy stock of harbor porpoise *(Phocoena phocoena)* in the Northeast multispecies sink gillnet fishery. The HPTRT included representatives of the sink gillnet fishery, NMFS, the Marine Mammal Commission, state marine resource management agencies, the New England Fishery Management Council (NEFMC), environmental organizations, and academic and scientific organizations.

Description of the Fishery

The Northeast multispecies sink gillnet fishery is a Category I fishery managed by NMFS and the NEFMC under the Northeast Multispecies Fishery Management Plan (as authorized by the Magnuson-Stevens Fishery Conservation and Management Act, or Magnuson-Stevens Act). Fishers participating in the Northeast multispecies sink gillnet fishery operate year-round in the nearshore and offshore waters from Maine to Rhode Island. They set their nets along the sea floor to target groundfish; specifically cod, haddock, hake, pollock, flounder, monkfish, and dogfish. Vessels are typically small (30-50 ft or 9-15 m) and operate from ports throughout New England. Each vessel sets between 40 and 200 nets, depending on the target species. Each net

Table 1. Take reduction plans/teams timeline of major events and *Federal Register* citations

	Pacific Offshore Cetacean	*Atlantic Offshore Cetacean*	*Gulf of Maine Harbor Porpoise*	*Mid-Atlantic*	*Atlantic Large Whale*
Date convened	Feb. 12, 1996 (61 FR 5385)	May 23, 1996 (61 FR 25846)	Feb. 12, 1996 (61 FR 5384)	Feb. 25, 1997 (62 FR 8428)	Aug 6, 1996 (61 FR 40819)
First meeting	Feb. 13-14, 1996 (61 FR 5385)	May 29-30, 1996 (61 FR 25846)	Feb. 14-15, 1996 (61 FR 5384)	Mar. 4-5, 1997 (62 FR 8428)	Sept.16-17, 1996 (61 FR 48131)
Draft submitted to NMFS	Aug. 15, 1996	Nov. 25, 1996	Aug. 8, 1996	Aug. 25, 1997	Feb. 5, 1997
NMFS publishes draft TRP & proposed regs	Feb. 14, 1997 (62 FR 6931)	Draft TRP & proposed regs not published	Aug. 13, 1997 (62 FR 43302) Comment period reopened and extended to Jan 14, 1998 (62 FR 65402); Revised proposed rule published Sep. 11, 1998 (63 FR 48670)	Sep. 11, 1998 (63 FR 48670)	Apr. 7, 1997 (62 FR 16519)
NMFS publishes final plan and final regs	Oct. 3, 1997 (62 FR 51805); Technical Amendment of Final Rule, May 21, 1998 (63 FR 27860) Interim final rule to be published Jan. 1999	Partially implemented under final rule to be published May 1999 on Atl. Highly Migratory Species (64 FR 29089)	Dec. 2, 1998 (63 FR 66464)	Dec. 2, 1998 (63 FR 66464)	Interim final on July 22, 1997 (62 FR 39157); Final rule to be published Feb. 1999 (64 FR 7529)
Follow-up meetings	May 29-30, 1997; June 1-2, 1998; May 26-27,1999 planned	Late1999 planned	Dec. 16-17, 1997; Fall 1999 planned	Fall 1999 planned	Feb. 8-10, 1999 planned; regional subgroups plan to meet during Spr/Sum/Fall 1999

is 50 fathoms (300 ft or 90 m) long and nets are tied together in strings of 1-30 nets. The fishery currently includes approximately 300 vessels.

Description of the Marine Mammal Bycatch

Incidental mortality of harbor porpoise in this fishery has been of concern since the late 1980s. The estimated average mortality of harbor porpoise killed incidental to this fishery from 1990-1995 was 1,833 animals, while the calculated PBR level for this stock is 483 animals. Although the primary species of concern for bycatch reduction measures in this fishery has been harbor porpoise, this fishery also has incidental mortality of the Western North Atlantic stock of Atlantic white-sided dolphins *(Lagenorhynchus acutus)*. The estimated average mortality of white-sided dolphins killed incidental to this fishery from 1990-1995 was 121 animals, and the PBR level for this stock was 192 animals. For more information on these marine mammals stocks, see Chapter II, or the *1998 U.S. Atlantic Stock Assessment Report*.

Elements of the Team's Draft Plan

The HPTRT submitted a consensus draft plan to NMFS on August 8, 1996. The team's draft plan represented a comprehensive approach to the problem of harbor porpoise incidental take. The plan is summarized in the *1997 MMPA Annual Report*.

Status of the Plan

Soon after the HPTRT submitted its plan to NMFS, the NEFMC implemented Framework Adjustment 19 to the Northeast Multispecies Fishery Management Plan. This action opened the Mid-Coast area to gillnet fishing with pingers during November and December. Because the NEFMC actions altered the assumptions upon which the HPTRT's consensus proceedings were based, NMFS modified the HPTRT's draft plan to be consistent with the fishery management measures while ensuring that the goal of the plan would still be met.

On August 13, 1997, NMFS published a proposed rule to implement the HPTRT (62 FR 43302). In the proposed rule, NMFS also proposed changes and provided updates to several non-regulatory aspects of the Implementation Plan.

Since the publication of NMFS' proposed rule, new information on the bycatch levels of harbor porpoise became available that strongly indicated that NMFS' proposed take reduction measures would not reduce harbor porpoise bycatch in the Gulf of Maine to levels below the PBR level. However, results of the Spring 1997 pinger experiment indicated that pingers appeared to be a viable management strategy throughout the year. In December 1997, NMFS reconvened the HPTRT to review this new information and to solicit additional recommendations for more effective bycatch reduction measures. The team reiterated that the goal of the draft take reduction plan is to reduce takes in the Gulf of Maine to below the Gulf of Maine portion of the PBR level. To achieve this goal, the HPTRT recommended tentative time/area closures and periods during which pingers should be used.

NMFS incorporated the new information and the team's recommendations in a second proposed rule published on September 11, 1998 (63 FR 48670). This proposed rule also incorporated harbor porpoise take reduction measures for mid-Atlantic coastal gillnet fisheries, as recommended by the Mid-Atlantic Take Reduction Team (see next section). The final rule implementing take reduction measures for both the Gulf of Maine and mid-Atlantic was published on December 2, 1998 (63 FR 66464). It puts into place a series of time and area closures where pingers are required, or where complete closures will be in effect. It also requires training and certification for fishers using pingers. The elements of the final rule as it pertains to the Northeast Multispecies sink gillnet fishery are summarized in Table 2.

NMFS is also in the process of implementing the following non-regulatory measures in support of the plan:

* developing a research plan to assess the long-term ecosystem impacts from widespread use of pingers;

Table 2. Time/area closures and periods of required pinger use for the Northeast Multispecies sink gillnet fishery as required by the final regulations implementing the Harbor Porpoise Take Reduction Plan.

Northeast Area:	
Aug.15 to Sep.13	Closed
Mid-coast Area:	
Sep. 15 to May 31	Closed, gillnets with pingers allowed
Massachusetts Bay Area:	
Dec. 1 to Feb. 28/29	Closed, gillnets with pingers allowed
Mar. 1-31	Closed
Apr. 1 to May 31	Closed, gillnets with pingers allowed
Cape Cod South Area:	
Dec. 1 to Feb. 28/29	Closed, gillnets with pingers allowed
Mar. 1-31	Closed
Apr. 1 to May 31	Closed, gillnets with pingers allowed
Offshore Area:	
Nov. 1 to May 31	Closed, gillnets with pingers allowed
Cashes Ledge Area:	
Feb. 1-28/29	Closed

* working with the Atlantic States Marine Fisheries Commission on the Atlantic Coastal Cooperative Statistics Program to provide managers with more timely bycatch and fisheries information on the Atlantic Coast;

* investigating options for providing support to fishers for pinger technology;

* conducting pinger training and certification for all fishers who wish to use pingers in the closed areas; and

* expanding NMFS' capabilities to do analytical research by hiring additional staff for its Northeast Fisheries Science Center.

Mid-Atlantic Take Reduction Team

NMFS established the Mid-Atlantic Take Reduction Team (MATRT) on February 25, 1997, to address interactions between harbor porpoise *(Phocoena phocoena)* and the Mid-Atlantic coastal gillnet fishery. The Mid-Atlantic coastal gillnet fishery also has bycatch of another strategic marine mammal stock, bottlenose dolphins *(Tursiops truncatus)* (Atlantic coastal stock), but the team agreed that the development of a take reduction plan for bottlenose dolphins should be delayed until 1999 in order to collect more information on stock abundance, stock identification, and incidental mortality levels.

Description of the Fisheries

This fishery includes all gillnet fishing from 72° 30' W longitude. (the northeastern tip of Long Island) to the North Carolina-South Carolina border, except those fisheries that operate solely within rivers, bays, and estuaries. Target species of this fishery include, but are not limited to: Atlantic croaker, Atlantic mackerel, Atlantic sturgeon, black drum, bluefish, herring, menhaden, scup, shad, striped bass, sturgeon, weakfish, white perch, yellow perch, dogfish, and monkfish. This fishery is estimated to have more than 655 active participants, many of whom target different species seasonally as the fish stocks migrate north and south along the Atlantic coast. The mesh size used in this fishery varies widely, from 12.5 cm (5 in) for shad to 30 cm (12 in) for monkfish. These interstate fisheries are managed in coordination with the Atlantic States Marine Fisheries Commission via state and federal Fishery Management Plans.

Description of the Marine Mammal Bycatch

The offshore portion of the U.S. Mid-Atlantic coastal gillnet fishery that targets monkfish and dogfish has been observed since 1993. Data from the observer program have been used to estimate annual mortality in the fishery: 103 harbor porpoise are estimated to have been incidentally killed in 1995 and 311 were killed in 1996, with the majority (70%) of the mortalities in February and March and in New Jersey, Maryland, and North Carolina. The fisheries responsible for these mortalities were targeting either dogfish or monkfish. Average estimated harbor porpoise mortality and serious injury during 1995 and 1996 was 207 in this offshore portion of the Mid-Atlantic coastal gillnet fishery.

The following marine mammals have also been taken in observed trips: one bottlenose dolphin in 1994, two common dolphins in 1995, and two common dolphins in 1996. For more information on these marine mammal stocks, see the U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment Reports.

Elements of the Team's Report to NMFS

The MATRT submitted a report to NMFS on August 25, 1997. Although the team did not reach consensus on a draft plan, the team's report incorporated both consensus and non-consensus recommendations for harbor porpoise bycatch reduction measures, as well as research and data collection recommendations for coastal bottlenose dolphins. Take reduction measures recommended by the team are summarized in the 1997 MMPA Annual Report.

Status of the Plan

NMFS combined the take reduction measures recommended for harbor porpoise in the mid-Atlantic with measures recommended for harbor porpoise in the Gulf of Maine and proposed a combined Harbor Porpoise Take Reduction Plan on September 11, 1998 (63 FR 48670). The final rule implementing the plan was published on December 2, 1998 (63 FR 66464). The most significant change from the proposed rule to the final was the application of management measures in the small

Table 3. Gear requirements for the large mesh gillnet fishery (includes gillnet with mesh size greater than 7 inches (17.78 cm) to 18 inches (45.72 cm)) required by the final rule implementing the Mid-Atlantic Take Reduction Plan.

Floatline Length:	
New Jersey Mudhole*	less than or equal to 3,900 ft (1188.7m)
New Jersey Waters (excluding the Mudhole*)	lessthan or equal to 4,800 ft (1463.0 m)
Southern Mid-Atlantic Waters	less than or equal to 3,900 ft (1188.7 m)
Twine Size:	
All Mid-Atlantic Waters	greater than or equal to .90 mm (.035 inches)
Tie Downs:	
All Mid-Atlantic Waters	Required
Net Cap:	
All Mid-Atlantic Waters	80 nets
Net Size:	A net must be no longer than 300 ft (91.4 m)
Net Tagging:	Requires all nets to be tagged by Jan.1, 2000
Time Area Closures:	
New Jersey Waters to 72º30'W longitude (including the Mudhole*)	Closed from Apr. 1 - 20
New Jersey Mudhole*	Closed from Feb. 15 - Mar. 15
Southern Mid-Atlantic Waters (MD, DE, VA, NC) to 72º30'W longitude	Closed from Feb. 15 - Mar. 15

New Jersey Mudhole: area off New Jersey with particularly high harbor porpoise bycatch. Defined as an area south of 40º30', north of 30º55', east of the coastline, and west of 73º20'.

mesh fishery. Stranding data and other bycatch information suggest that small mesh between five inches (12.5 cm) and seven inches (17.5 cm) may be a source of bycatch, and NMFS has implemented gear restrictions accordingly. For fisheries using mesh less than five inches (12.5 cm), NMFS has limited data to suggest that there is a bycatch problem, yet will continue to collect and evaluate data from this segment of the fishery to determine whether further take reduction measures are necessary for the small mesh component of this fishery. Tables 3 and 4 summarize the gear restriction and time-area closures put into effect for large and small mesh gillnet under the final rule implementing the Mid-Atlantic take Reduction Plan.

NMFS is also in the process of implementing the following non-regulatory measures in support of the plan:

* expansion of capabilities to observe the mid-Atlantic fisheries by exploring alternative platforms to obtain a better characterization of coastal fisheries that were not accessible to the traditional observer program;

* voluntary skipper education workshops in the mid-Atlantic; and

* increased observer coverage of the mid-Atlantic fisheries consistent with a valid sampling scheme, including the use of alternative platforms and increased responsiveness to observed strandings.

The Pacific Offshore Cetacean Take Reduction Plan

NMFS convened the Pacific Offshore Cetacean Take Reduction Team (PCTRT) on February 12, 1996 to address takes of short-finned pilot whales *(Globicephala macrorhynchus)*, mesoplodont beaked whales *(Mesoplodon spp.)*, Baird's beaked whales *(Berardius bairdii)*, Cuvier's beaked whales *(Ziphius cavirostris)*, pygmy sperm whales *(Kogia breviceps)*, sperm whales *(Physeter macrocephalus)*, and humpback whales *(Megaptera novaeangliae)* in the California/Oregon drift gillnet fishery for thresher shark and swordfish.

Description of the Fishery

The CA/OR drift gillnet fishery is regulated primarily by the CDFG under a limited access permit system. The Oregon Department of Fish and Wildlife issues ten "unlimited" landing permits and offers 44 "limited" landing permits by lottery (although only 15 people applied for permits in 1996). The fishery operates from the United States/Mexico border to waters off Oregon and Washington. The fishery is closed from February through late April. From late April through August, drift gillnets cannot be used to catch swordfish or thresher shark within 75 nautical miles of shore. Only limited restrictions are in place from August through January.

Drift gillnets are tied at one end to a vessel and drift with the current at the other end. Most nets are made of multifilament nylon and are 1.8 km (1 nmi) in length. They typically have a stretched mesh size from 45-55 cm (18-22 in). Extender lines, which attach the net to buoys at the surface, suspend the net below the surface. The net is set at night and retrieved at dawn. There are approximately 150 active fishers in the drift gillnet fishery.

Description of the Marine Mammal Bycatch

The mortality estimates from observer data available through 1996 are summarized in the *1998 Pacific Marine Mammal Stock Assessment Report*. Based on the average annual mortality and serious injury of marine mammals in this fishery from 1991-1996, takes are above the PBR levels for the following marine mammal stocks: sperm whales (CA/OR/WA stock), short-finned pilot whales (CA/OR stock), and mesoplodont beaked whales. In addition, the level of mortality and serious injury that occurs incidental to this fishery is above 50% of the PBR level for Baird's beaked whales (CA/OR/WA stock) and minke whales *(Balaenoptera acutorostrata)* (CA/OR/WA stock).

Elements of the Team's Draft Plan

On June 27, 1996, the PCTRT reached consensus on a draft plan. The PCTRT submitted its draft plan to NMFS on August 15, 1996. Take reduction measures recommended by the team are summarized in the *1997 MMPA Annual Report*.

Status of the Plan

As recommended by the team, a pinger experiment was conducted in the fishery during the 1996/1997 fishing season, resulting in cetacean entanglement rates being 75% lower in nets that had pingers. Based on these preliminary findings, NMFS and the PCTRT both agreed that pingers should be deployed on all nets. This provi-

Table 4. Gear requirements for the small mesh gillnet fishery (includes gillnet with mesh size greater than 5 inches (12.7 cm) to less than 7 inches (17.5cm)) required by the final rule implementing the Mid-Atlantic Take Reduction Plan.

Floatline Length:	
New Jersey Waters	less than or equal to 3,000 ft (914.4 m)
Southern Mid-Atlantic Waters	less than or equal to 2,118 ft (645.6 m)
Twine Size:	
All Mid-Atlantic Waters	greater than or equal to .81 mm (.031 inches)
Net Cap:	
All Mid-Atlantic Waters	45 nets
Net Size:	A net must be no longer than 300 ft (91.4 m)
Net Tagging:	Requires all nets to be tagged by Jan. 1, 2000
Time/Area Closures:	
New Jersey Mudhole	Closed from Feb. 15 - Mar. 15

sion was included in the proposed rule to implement the plan on February 14, 1997 (62 FR 6931) and in the final rule implementing the plan on October 3, 1997 (62 FR 51805). In addition, a technical amendment to the final rule was published on May 21, 1998 (63 FR 27860) to correct and clarify the final rule.

The final rule, as amended, contains the following regulatory provisions:

* minimum six fathom (36 ft) net buoy line extender length - the extender length is the length of the line from the surface of the water to the top of the net;

* mandatory fleetwide use of pingers on the floatline (top of the net) and leadline (bottom of the net) during all fishing operations; and

* mandatory requirement for all vessel owners and captains to attend skipper education workshops,

In conjunction with the publication of the final rule, NMFS has also taken steps to implement the non-regulatory aspects of the plan. NMFS has requested that the state of California continue their policy of not reissuing permits that have lapsed and that the State of Oregon not issue more than the current level of permits. The observer program's effectiveness has been enhanced by meeting the 20% observer coverage level recommended by the team, by ensuring that the observer program is targeting all vessels (with the exception of vessels in which there are safety concerns or inadequate space to carry an observer), and by having observers collect additional information on net and environmental characteristics.

Skipper workshops were held throughout California and Oregon in the summer of 1997, and again in 1998. At the workshops, NMFS presented updated information on the status and content of the final take reduction plan and background information on the MMPA and the affected marine mammal stocks. NMFS also provided demonstrations of pingers and encouraged feedback on the effectiveness of the required fishing strategies in reducing marine mammal interactions through informal question and answer sessions. NMFS believes that the skipper education workshops have played a major role in the success of the plan.

Results from the 1997/1998 fishing season indicate that compliance with the plan is high, and that bycatch of marine mammals is below the calculated PBR level for all strategic stocks. Preliminary results from the 1998/1999 fishing season also indicate good compliance with the regulations, and with the exception of sperm whales, bycatch levels are less than PBR for all marine mammal stocks.

The Atlantic Offshore Cetacean Take Reduction Plan

NMFS convened the Atlantic Offshore Cetacean Take Reduction Team (AOCTRT) on May 23, 1996, to address interactions between strategic marine mammal stocks and the Atlantic pelagic driftnet, pair trawl, and longline fisheries for swordfish, tuna and sharks. Cumulatively, these fisheries incidentally take Atlantic spotted dolphin *(Stenella frontalis)*, bottlenose dolphin *(Tursiops truncatus)*, common dolphin (*Delphinus delphis)*, pantropical spotted dolphin *(Stenella attenuata)*, long-finned pilot whales *(Globicephala melas)*, short-finned pilot whales *(Globicephala macrorhynchus)*, beaked whales *(Mesoplodon spp.* and *Ziphius cavirostris)*, right whales *(Eubalaena glacialis)*, humpback whales *(Megaptera novaeangliae)*, and sperm whales *(Physeter macrocephalus)* at levels that are estimated to be above the PBR levels established for these stocks. The AOCTRT included representatives of each of the three fisheries, environmental and conservation groups, several states, the Mid-Atlantic Fisheries Management Council, independent fisheries, the marine mammal biological community, and NMFS.

Description of the Fisheries

The Atlantic swordfish fishery is managed by NMFS under the Atlantic Swordfish Fishery Management Plan (as authorized by the Magnuson-Stevens Act) and under the Atlantic Tunas Convention Act (ATCA). ATCA directs NMFS to regulate the swordfish fishery as required by the International Commission for the Conservation of Atlantic Tunas (ICCAT). A Total Allowable Catch level is set for the directed swordfish fishery each year; approximately 98% is allocated to the longline/harpoon fisheries and the remaining 2% is allocated to the drift gillnet fishery. The Atlantic tuna fishery is also managed

under the authority of ATCA, which authorizes NMFS to regulate the tuna fishery as required by ICCAT. The Atlantic shark fishery is managed by NMFS under the Atlantic Sharks Fishery Management Plan (as authorized by the Magnuson-Stevens Act).

Drift Gillnet Fishery. This fishery has typically operated off Cape Hatteras, North Carolina, in the winter and spring, and from Hudson Canyon off Cape Cod to the Hague Line during the summer. Drift gillnets used in this fishery have a mesh size of 45-55 cm (18-22 in), are 60-70 meshes deep, and are set 5.4-9 m (18-30 ft) below the surface. The total length of net that can be set by each vessel is 2.4 km (1.5 mi). The nets are typically set at dusk and retrieved at dawn. From 1994-1998, there have been 10-12 active vessels in the fishery. Swordfish is the primary target of the fishery, although tuna and shark are also caught and landed.

Longline Fishery. The Atlantic longline fishery operates from the Gulf of Mexico and the Caribbean to the Grand Banks and off Newfoundland. Longlines consist of a continuous monofilament mainline suspended from the surface by a series of floats. Gangions with baited hooks are attached to the mainline at regular intervals. The mainline averages about 40 km (25 mi), but may be as long as 128 km (80 mi). There are between 200-400 active participants in the fishery.

Pair Trawl Fishery. The pair trawl fishery operated in pelagic waters off Long Island, New York from 1991 to 1995 (primarily around Hudson Canyon). The fishery used a large mesh net (mesh size of 3-18 m or 10-60 ft) towed between two trawlers to target bigeye tuna. It typically operated from June to October. There were 12 participants in the fishery in 1995.

Description of the Marine Mammal Bycatch

Drift Gillnet Fishery. The mortality estimates from observer data available through 1996 indicate that the level of mortality and serious injury incidental to this fishery was equal to or above the PBR levels for the following strategic stocks: North Atlantic right whale (Western North Atlantic stock (WNA)), common dolphin (WNA), short-finned pilot whale (WNA), dwarf sperm whale (WNA), mesoplodont beaked whale (WNA), and spinner dolphin (WNA). In addition, the level of mortality and serious injury that occurs incidental to this fishery is above 50% of the PBR level for Atlantic spotted dolphin (WNA) and pantropical spotted dolphin (WNA). For a complete summary of stock-specific mortality and serious injury levels, refer to the *1998 U.S. Atlantic Marine Mammal Stock Assessment Report*.

Longline Fishery. The mortality estimates from observer data available through 1995 indicate that the level of mortality and serious injury that occurs incidental to this fishery was greater than the PBR level for short-finned pilot whales (NMFS estimates that approximately 5.5 pilot whales were taken annually from 1992-1995; however, identification of incidentally taken pilot whales as to stock (long-finned vs. short-finned) could not always be determined. The PBR for long-finned pilot whales is 32 animals, and the PBR for short-finned pilot whales is 4.6 animals. The fishery also has observed takes of Risso's dolphin *(Grampus griseus)*, spotted dolphin, spinner dolphin *(Stenella longirostris)*, common dolphin, bottlenose dolphin, and killer whale *(Orca orcinus)*. It should be noted that the team did not have access to mortality estimates from the 1994/1995 fishing seasons, although it did review observed takes (including a significant number of animals reported to be released alive). Some of these animals released alive were injured. Because national guidelines were not in place for determining which injuries are serious, the team was unable to make specific recommendations regarding these takes. For a complete summary of stock-specific mortality and serious injury levels, refer to the *1998 U.S. Atlantic Marine Mammal Stock Assessment Report*.

Pair Trawl Fishery. The mortality estimates from observer data indicate that the level of mortality and serious injury that occurs incidental to this fishery was equal to or above the 50% of the PBR level for common dolphins, a strategic stock. For a complete summary of stock-specific mortality and serious injury levels, refer to the *1998 U.S. Atlantic Marine Mammal Stock Assessment Report*.

Table 5. Closures and restrictions on the Northeast multispecies sink gillnet fishery required by the interim final regulations implementing the Large Whale Take Reduction Plan.

Location	Dates	Comments
Great South Channel Right Whale Critical Habitat	April 1 - Jun. 30	Sink gear prohibited: exception is the "sliver area"
Great South Channel Right Whale Critical Habitat	July 1 - Mar. 31	Sink gillnet gear restricted
Cape Cod Bay Right Whale Critical Habitat - federal portion	Jan. 1 - May 15	Sink gillnet gear prohibited until right whales leave the area
Cape Cod Bay Right Whale Critical Habitat - federal portion	May 16 - Dec. 31	Sink gillnet gear restricted
Stellwagen Bank/Jeffreys Ledge	yearround	Sink gillnet gear restricted
All other areas in the NE Atlantic	yearround	Sink gillnet gear restricted

Elements of the Team's Draft Plan

On November 25, 1996, the AOCTRT submitted its draft plan to NMFS. The AOCTRT developed comprehensive strategies for each fishery -drift gillnet, longline, and pair trawl. Each comprehensive strategy included a number of activities that are designed to reduce the incidental mortality and serious injury of strategic stocks of marine mammals. The team's plan recommended that several general regulatory and non-regulatory actions be initiated to reduce bycatch of marine mammals in all three fisheries, and that fishery-specific strategies also be implemented. Take reduction measures recommended by the team are summarized in the *1997 MMPA Annual Report*.

Status of the Plan

On October 20, 1998, NMFS proposed regulations to prohibit the use of driftnets in the Atlantic swordfish fishery and to eliminate any incidental catch allowance for swordfish in any other driftnet fishery. The intent of the action was to reduce interactions of driftnets in the Atlantic swordfish fishery with certain protected marine species. This action was taken under the authority of the Magnuson-Stevens Act and the Atlantic Tunas Convention Act. This action was published as a final rule in January 1999.

The recommendations regarding operation of the pelagic longline fishery are being partially addressed under a Fishery Management Plan for Highly Migratory Species (HMS FMP). The final rule implementing the FMP is set to be published in May 1999. The rule will include the team's recommendation that the length of line set be limited to no more that 24 nautical miles (44.5 km) in the mid-Atlantic Bight from July 1, 1999 to June 30, 2000. No longline fishing will be allowed in the Northeastern United States closed area in June, and all marine mammals hooked or entangled must be immediately released and fishing operations moved at least 1 nautical mile (2 km) before resuming fishing. The rule will also implement a limited access program for the fishery. The only regulatory-requirement recommended by the Atlantic Offshore Cetacean Take Reduction Team that is not being implemented under the HMS FMP is the reduction of the maximum soak time (by retrieving gear in the order it was set). There were concerns expressed by participants in the fishery that returning to the point where the gear was set would be costly (in terms of fuel costs) and may not be safe in rough seas.

Another team recommendation implemented in 1998 was a comprehensive pelagic dolphin survey - a survey of the western Atlantic Ocean. The survey was a coordinated effort of both the NMFS Northeast and Southeast

Table 6. Closures and restrictions on the Mid-Atlantic coastal gillnet fishery required by the interim final regulations implementing the Large Whale Take Reduction Plan.

Location	Dates	Comments
All areas gillnet	Dec. 1 - Mar. 31	Anchored sink gear restricted
All areas	year-round	Restrictions on hauling, stowing, and setting gillnet gear

Fisheries Science Centers.

NMFS expects to reconvene the AOCTRT, minus the pair trawl and drift gillnet fishermen, in the winter of 1999. The team will be asked to review current data on population abundance, observed and estimated mortality and serious injury levels, and their draft plan in order to make recommendations regarding appropriate take reduction strategies and research and monitoring needs for the future.

The Atlantic Large Whale Take Reduction Team

On August 6, 1996, NMFS established the Atlantic Large Whale Take Reduction Team (ALWTRT) to address the incidental bycatch of large baleen whales, primarily the northern right whale *(Eubalaena glacialis)* and the humpback whale *(Megaptera novaeangliae)* in the following fisheries: the Gulf of Maine/U.S. mid-Atlantic lobster trap/pot fishery, the Gulf of Maine sink gillnet fishery, the mid-Atlantic coastal gillnet fishery, and the southeastern U.S. Atlantic shark gillnet fishery. These two large whale stocks are considered strategic under the MMPA because they are listed as endangered under the ESA, and because the level of human-caused mortality is greater than the calculated PBR levels.

The ALWTRT includes representatives from each fishery, NMFS, state marine resource management agencies, the New England Fishery Management Council, the Mid-Atlantic Fishery Management Council, the Marine Mammal Commission, environmental organizations, and academic and scientific organizations.

Description of the Fisheries

Lobster Trap/Pot Fishery. This fishery is managed by both individual states and by NMFS, under the Lobster Fishery Management Plan (as authorized by the Magnuson-Stevens Act). This fishery operates in nearshore and offshore waters in the Gulf of Maine and the mid-Atlantic. Vessels used in the inshore fishery are typically under 15 m (50 ft) in length and have a crew of one to four people. Vessels used in the offshore fishery are typically between 15-30 m (50-100 ft) in length and have a crew of three to five people. Offshore vessels generally fish in waters up to 360 m (1200 ft) deep. There are approximately 14,600 permit holders, including 4000 vessels that fish in offshore waters.

Gulf of Maine and Mid-Atlantic Gillnet Fisheries. See the description of these fisheries under the section of this chapter on the harbor porpoise take reduction plan and the mid-Atlantic take reduction plan, respectively.

Southeast Shark Gillnet Fishery. This fishery is regulated by NMFS under the Atlantic Sharks Fishery Management Plan (as authorized by the Magnuson-Stevens Act). This fishery operates primarily in federal waters from Port Salerno, Florida to Savannah, Georgia. Nets are typically 300 m (1000 ft) to 1.6 km (1 mi) in length and are set and fished overnight. There are approximately 16 active fishers in the fishery.

Table 7. Closures and restrictions on the Southeast U.S. driftnet fishery required by the interim final regulations implementing the Large Whale Take Reduction Plan.

Location	Dates	Comments
Southeast restricted area	Nov. 15 - Mar. 31	Driftnet gear prohibited; strikenets are permitted under certain conditions
Southeast observer area	Nov. 15 - Mar. 31	Driftnet vessels required to carry observers if fishing in Southeast observer area. Driftnet gear required to be marked.

Description of the Marine Mammal Bycatch

Records of whale entanglements in the lobster pot/trap fishery consist entirely of strandings and opportunistic reports of live and dead animals. Recent studies indicate that this fishery incurs 0.4 serious injuries of right whales each year. The PBR level for right whales is 0.4 animals.

There are also records of humpback and right whale entanglements attributed to gillnet gear in the Gulf of Maine, mid-Atlantic, and Southeast, but quantitative estimates of average annual mortality in these fisheries were not available for the team. For more information on these marine mammal stocks, see Chapter II. Marine Mammal Stock Assessment Program.

The Status of the Plan

The ALWTRT did not reach consensus on a plan for reducing bycatch of large whales in the Atlantic. The ALWTRT submitted a draft report of their deliberations to NMFS, which was used, in part, to develop a proposed and interim final rule which served as the take reduction plan for the fisheries. A proposed rule to implement the Atlantic Large Whale Take Reduction Plan was published on April 7, 1997 (62 FR 16519). NMFS held 12 public hearings from Maine to Virginia and received approximately 13,000 comments on the proposed rule. As a result, major changes to boundaries of affected areas, gear and marking requirements, and contingency measures were made. Because the changes from the proposed rule were significant, NMFS issued regulations for reducing bycatch in these fisheries as an interim final rule on July 22, 1997 (62 FR 39157) and accepted additional comments on the rule. A final rule implementing the plan was published in February 1999.

Elements of the Interim Final Plan

The interim final rule closed right whale critical habitat areas to specific types of fishing gear during certain seasons and modified fishing practices in such a manner designed to meet the goals of the MMPA without damaging a vital fishing industry (see Tables 5-8). The plan uses seven strategies to achieve the six-month goal:

• Closure of right whale critical habitats to some gear types during times of the year when right whales are present;

• Restricting the way strike nets are set in the Southeast shark gillnet fishery;

• Requiring that all lobster and anchored gillnets be set in such a way as to prevent line from floating at the surface;

• Requiring all lobster and anchored gillnets to have at least some additional characteristics that are likely to reduce the risks of entanglements;

• Requiring that drift gillnets in the mid-Atlantic be either tended or stored on board at night;

• Improving the voluntary network of personnel trained to assist in disentangling right whales; and

• Prohibiting storage of inactive gear in the ocean.

Table 8. Closures and restrictions on lobster trap/pot fishing required by the interim final regulations implementing the Large Whale Take Reduction Plan.

Location	Dates	Comments
Great South Channel Right Whale Critical Habitat	April 1 - Jun. 30	Lobster gear prohibited
Great South Channel Right Whale Critical Habitat	July 1 - Mar. 31	Lobster gear restricted
Cape Cod Bay Right Whale Critical Habitat	Jan. 1 - May 15	Lobster gear restricted
Stellwagen Bank/Jeffrey's Ledge	year-round	Lobster gear restricted
All other areas	year-round	Lobster gear restricted

Table 8. Closures and restrictions on the Southeast U.S. driftnet fishery required by the interim final regulations implementing the Large Whale Take Reduction Plan.

Location	Dates	Comments
Southeast restricted area	Nov. 15 - Mar. 31	Driftnet gear prohibited; strikenets are permitted under certain conditions
Southeast observer area	Nov. 15 - Mar. 31	Driftnet vessels required to carry observers if fishing in Southeast observer area. Driftnet gear required to be marked.

In addition, gear covered under this plan must be marked so that the type of gear that entangles cetaceans can be identified, and gear near the surface cannot be allowed to float at the surface.

The use of gear modifications to minimize the risks of entangling large whales will be key to the long-term success of the take reduction plan. To this end, the LWTRT developed lists of acceptable gear technologies currently available that are believed to reduce the likelihood that cetaceans will become entangled, or increase the likelihood that a cetacean will break free from the gear if entangled. These gear technologies include weak links for buoy lines and the use of sinking line for the buoy line or the ground lines. Fisheries may be required to use one or more of these acceptable technologies if they fish in certain areas at certain times of the year.

Differentiation of Serious and Non-Serious Injury in Marine Mammals

One of the mandates of section 118 of the MMPA is to reduce incidental mortality and serious injury of marine mammals that occurs in the course of commercial fishing operations to below Potential Biological Removal (PBR) levels. In addition, the long-term goal of the MMPA is to reduce incidental mortality and serious injury to insignificant levels approaching a zero mortality and serious injury rate. Defining the concept of "serious injury" is integral to implementing the MMPA.

NMFS provided a clear definition of "injury" to marine mammals under the final regulations implementing the 1994 amendments to the MMPA (50 CFR 229.2), as...

"...a wound or other physical harm. Signs of injury include, but are not limited to, visible blood flow, loss of or damage to an appendage or jaw, inability to use one or more appendages, asymmetry in the shape of the body or body position, noticeable swelling or hemorrhage, laceration, puncture, or rupture of eyeball, listless appearance or inability to defend itself, inability to swim or dive upon release from fishing gear, or signs of equilibrium imbalance. Any animal that ingests fishing gear, or any animal that is released with fishing gear entangling, trailing, or perforating any part of the body will be considered injured regardless of the absence of any wound or other evidence of an injury."

However, recognizing that determining which injuries are likely to lead to mortality, and thus should be considered serious, is tremendously difficult, NMFS defined serious injury more broadly, as...

". . .any injury that is likely to result in mortality."

On April 1-2, 1997, a workshop was held to explore this issue and to begin developing a broad range of guidelines that could be used to determine which marine mammals entangled in fishing gear or injured incidental to fishing operations should be considered seriously injured as a result of the encounter. (For more background on this issue, and a summary of the workshop's findings, see the *1997 MMPA Annual Report*). The results of this workshop were published as a NOAA technical memorandum. Based on guidance from this workshop, NMFS will be reviewing incidental marine mammal injuries for several fisheries to determine which injured animals should be considered "seriously injured". These determinations will be published in the *Draft Marine Mam-*

mal Stock Assessment Reports for 2000 and will be considered in the development of the proposed LOF for 2001.

Authorization for the Incidental Taking of Threatened or Endangered Marine Mammals

Section 101(a)(5)(E) of the MMPA allows for the take of marine mammals listed as endangered or threatened under the ESA incidental to commercial fishing operations, if it can be determined that:

1) incidental mortality and serious injury will have a negligible impact on the recovery of the affected species or stock;

2) a recovery plan for that species or stock has been developed or is being developed; and

3) where required under section 118, a monitoring program has been established, vessels are registered, and a take reduction plan has been developed or is being developed.

In order to determine whether commercial fishing activities are having a negligible impact on endangered and threatened stocks of marine mammals, NMFS evaluated the total number of all incidental serious injuries and mortalities due to commercial fishing for each such stock based on information included in final stock assessment reports and in the Environmental Assessment (EA) prepared for the implementation of section 118 of the MMPA. For more information on the authorization for taking threatened or endangered marine mammals, see the *1997 MMPA Annual Report*.

In order to determine which fisheries would receive permits under section 101(a)(5)(E), NMFS classified ESA-listed marine mammal stocks into three categories (August 31, 1995; 60 FR 45399). These classifications and associated stocks are listed in Table 9. NMFS issued individual three-year permits to fisheries that may have incidental taking of marine mammals in the first category, and will issue individual permits to participants in conjunction with section 118 authorization certificates, subject to the same regulations regarding reporting of marine mammal injuries and mortalities, maintenance and possession of a current authorization certificate, prohibitions on intentional lethal taking, and carrying an observer if so requested by NMFS.

There were no new authorizations for the incidental taking of endangered or threatened species issued in 1998. Existing permits were still in place and will authorize takings until the end of 1998.

Table 9. Classification of ESA-listed Stocks Under Section 101(a)(5)(E)

Species	Stock
Mortality and serious injury incidental to commercial fishing operations are having a negligible impact for the following stocks:	
Humpback whale	Central North Pacific stock
Steller sea lion	Eastern stock
	Western stock
Mortality and serious injury incidental to commercial fishing operations could not be determined to be having a negligible impact for the following stocks:	
Fin whale	Western North Atlantic stock
Humpback whale	Western North Atlantic stock
	California/Oregon/ Washington-Mexico
Northern right whale	Western North Atlantic stock
Sperm whale	Western North Atlantic stock
	California/Oregon/ Washington stock
Hawaiian monk seal	Entire species
There is no documented evidence of fishery-related interactions for the following stocks:	
Blue whale	Western North Atlantic stock
	California/Mexico stock
	Hawaii stock
Bowhead whale	Western Arctic stock
Fin whale	California/Oregon/ Washington stock
	Alaska stock
	Hawaii stock
Humpback whale	Western North Pacific stock
Northern right whale	North Pacific stock
Sei whale	Western North Atlantic stock
	Eastern North Pacific stock
Sperm whale	Northern Gulf of Mexico stock
	Alaska stock
	Hawaii stock
Guadalupe fur seal	Entire species

Chapter IV. Marine Mammal Interactions with Salmonids and Human Activities

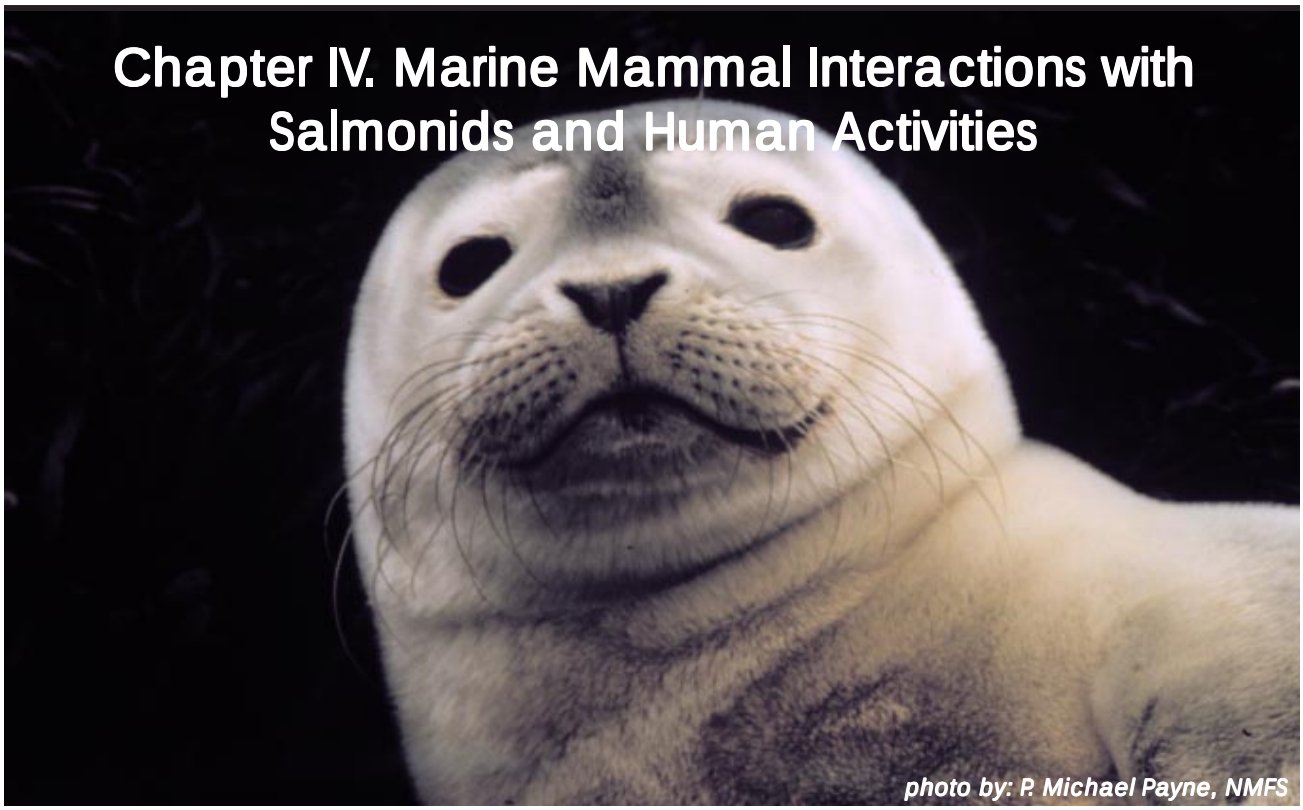


photo by: P. Michael Payne, NMFS

Under the protection of the Marine Mammal Protection Act (MMPA), several pinniped populations (seals and sea lions) have rebounded to historically high levels. Unfortunately, the expansion of some pinniped populations has resulted in increased conflicts with human activities and other marine resources. Pinnipeds are known to cause damage to (or loss of) catch in commercial and recreational fisheries; interact with humans in marinas and docks, thus raising human safety concerns; and affect other marine resources of concern (*e.g.*, salmonids).

On the West Coast of the United States, California sea lion *(Zalophus californianus)* and Pacific harbor seal *(Phoca vitulina)* populations have increased at a rate of 5-8% per year since the mid-1970s (some harbor seal populations are believed to now be near carrying capacity and relatively stable). Their range has expanded into areas where these pinnipeds were previously unheard of (*e.g.*, California sea lion conflict with fish passage over 100 miles up the Columbia River). Conflicts with "partyboat" fisheries in southern California, salmon troll and gillnet fisheries, and other fisheries are being reported with increased frequency. Interactions with these and other human activities have increased as the range and size of the pinniped populations have increased. With the recent listings under the Endangered Species Act (ESA) of salmon and steelhead populations on the West Coast of the United States, there are increased concerns about the impacts of the expanding pinniped populations on the recovery of ESA-listed salmonids. Pinnipeds are known to forage on salmonids, and in some situations, significant impacts on salmonid populations have been documented. For example, at the Ballard Locks in Seattle, Washington, California sea lions have been reported to take up to 65% of the annual return of adult winter steelhead in the Lake Washington system.

In response to concerns about expanding pinniped populations, Congress amended the MMPA in 1994 to add a new section 120 that provided a process to allow pinniped removal authority in certain situations, directed NMFS to conduct an investigation and report on California sea lion and Pacific harbor seal impacts on salmonids and U.S. West Coast ecosystems, and directed NMFS to establish a Gulf of Maine Task Force to advise on issues regarding pinniped interacting in a dangerous or damaging manner with Gulf of Maine aquaculture resources. Implementation of Section 120 in each of these areas follows.

California Sea Lion Conflict with Steelhead at the Ballard Locks - MMPA Section 120 Pinniped Lethal Removal Authority

The most widely known and intensely studied pinniped/salmonid conflict is California sea lion predation on winter steelhead at the Ballard Locks in Seattle, Washington. California sea lions first began appearing in the Ballard Locks area on a somewhat regular basis in 1980, but their predation on steelhead was not viewed as a resource conflict until 1985, when a significant decline in the wild winter steelhead spawning escapement was noted. Subsequent scientific studies documented that sea lions were removing significant numbers of adult steelhead that were returning to the Lake Washington system to spawn. Between 1986 and 1992, sea lions consumed 42-65% of the total return of spawning winter steelhead each year and prevented achievement of spawning escapement goals. In spite of intense sea lion deterrence and mitigation efforts from 1985 to 1995, a small number of sea lions returned to the Ballard Locks area each season and preyed on substantial numbers of returning adult steelhead. Although adequate spawning and rearing habitat was available, the winter steelhead population declined significantly during this timeframe down to an all time low of only 70 spawners in 1994.

In June 1994, the Washington Department of Fish and Wildlife (WDFW) applied under the new "Pinniped Removal Authority" under section 120 of the MMPA for authorization to lethally remove these individual sea lions that prey on winter steelhead migrating through the Ballard Locks. In accordance with section 120, NMFS made a determination on the adequacy of the application and provided public notice of the application with a request for public comments. NMFS also formed the Ballard Locks Pinniped-Fishery Interaction Task Force (Task Force), which was convened to review the pertinent information and public comments and to make recommendations to NMFS on approval or denial of the State's application. In November 1994, after several public meetings, the Task Force completed its report and recommended that approval of lethal removal of individually identifiable predatory California sea lions be allowed only if a number of conditions were met regarding temporary holding of sea lions in captivity, achievement of a specified predation rate, use of deterrence, and other measures.

On January 6, 1995, after consideration of the Task Force recommendations, public comments, and pertinent scientific information, NMFS issued a three-year Letter of Authorization (LOA) to WDFW that authorized the intentional lethal taking of California sea lions that prey on wild winter steelhead that migrate through the Ballard Locks. The LOA authorized lethal removal only if the state was in compliance with eleven conditions in the LOA including having a non-lethal deterrence program (acoustic deterrence devices) underway and undertaking efforts to capture and temporarily hold predatory sea lions if practical and feasible. Subsequent to the issuance of the authorization, one sea lion was captured and held in captivity for the duration of the steelhead run, and no sea lions were lethally removed.

In September 1995, as required by section 120(c)(5) of the MMPA and the conditions of the LOA, the Task Force was reconvened to evaluate the effectiveness of measures taken by WDFW under the LOA. The Task Force found that sea lion predation posed a continued risk for recovery of the steelhead run because of the continuing low numbers of winter steelhead and recommended modifications to the conditions on the lethal removal authorization to better preserve the steelhead run. In March 1996, NMFS modified the conditions of the LOA based on the Task Force recommendations and additional information that the individual sea lion, which had been held in captivity in 1995, was returning to the Ballard Locks and again preying on salmonids. NMFS removed the temporary captive holding condition in the LOA and modified the conditions for lethal removal of a "predatory" sea lion, which was defined as an individually identifiable sea lion that has preyed on returning steelhead and has foraged in the ensonified zone at the Ballard Locks (the area of intense acoustic deterrence). A "predatory" sea lion could be lethally removal by WDFW during a steelhead season (January 1 to May 31) upon being observed foraging at the Ballard Locks.

Upon issuance of the modified LOA in 1996, WDFW indicated that it intended to lethally remove predatory sea lions. However, shortly after public notice of the modified LOA, NMFS was contacted by Sea World in Orlando, Florida with an offer to receive the predatory sea lions permanently for public display. Prior to this time, no display facility had expressed any interest in permanent holding of these adult male sea lions. Since predatory sea lions would be permanently removed and could not return to prey on steelhead (which was the intent of lethal removal), NMFS and WDFW agreed to capture three predatory sea lions and transfer them to Sea World in May 1996. No sea lions were lethally removed in 1996.

In September 1996, the Task Force was again reconvened to review information from the 1996 season and to make recommendations on whether the LOA should be extended beyond the June 30, 1997 expiration date. The Task Force submitted a report to NMFS recommending that the LOA be extended because insufficient time had passed to evaluate the success of management actions at Ballard Locks. The Task Force opinions on the extension ranged from no extension to a period of eight years (two steelhead cycles) with the majority of the Task Force favoring an extension of four years (one steelhead cycle) to June 30, 2001. Notice of the proposed extension of the LOA was published in the *Federal Register* on June 19, 1997 (62 FR 33396) with a 30-day public comment period. After consideration of the Task Force recommendation and public comments, NMFS approved a four-year extension to the LOA to June 30, 2001 because there was a need to continue protecting and enhancing the winter steelhead back to the population levels of the mid-1980s, and to allow sufficient time to evaluate the effectiveness of lethal removal. Notice of the extension was published in the *Federal Register* on September 29, 1997 (62 FR 50903).

During the 1997 and 1998 steelhead seasons, sea lion presence at the locks declined dramatically. Prior to capture and transfer of the principal problem sea lions, biologists recorded 111 hours of sea lion presence in 1996. In contrast, in 1997 and 1998, sea lion presence was recorded as 46 hours and four hours respectively. This difference in sea lion presence appears directly related to the absence of the predatory sea lions, which accounted for about 60% of the sea lion presence in 1996. The problem sea lions likely would have been at the Locks (based on past patterns) had they not been removed. The 1997 and 1998 observations indicate that permanent removal of known predatory sea lions reduces the presence of sea lions during the steelhead run and may have a beneficial effect on reducing recruitment of new sea lions to the area. The information on sea lion presence indicates that past predatory sea lions are not replaced rapidly. It also does not appear that new sea lions are frequently exploring the Locks area in the absence of the predatory animals that constantly entered the Locks area (*i.e.*, new animals are not following the predatory sea lions into the Locks area and becoming aware of the site).

California Sea Lion Conflict with Salmonids at Willamette Falls, Oregon

Another conflict between California sea lions and salmonids, similar to the Ballard Locks situation, is being monitored at a fish passage facility at Willamette Falls in Oregon City, Oregon, which is 204.8 km (128 mi) upriver from the ocean. This conflict first drew attention in 1994 when the Oregon Department of Fish and Wildlife (ODFW) raised concerns about the effects of California sea lions foraging on spring chinook at the entrance to the fish ladder during the salmonid migration each year since 1988. A subsequent joint NMFS/ODFW pilot study conducted in May 1995 documented that there were four to six male California sea lions consuming both steelhead and spring chinook salmon in the area below the falls.

ODFW began a monitoring program on sea lion predation at Willamette Falls in 1996. ODFW found that at least five California sea lions were foraging at the Falls each year in April and May. The sea lions were observed consuming 89 salmonids in 1996, 165 in 1997 and 144 in 1998. The salmonids involved are spring chinook salmon and winter steelhead, both of which have been listed as threatened under the ESA.

NMFS and ODFW have developed a program of non-lethal removal measures to prevent sea lion predation at this site. In February 1997, NMFS and ODFW prepared an draft EA that examined the environmental consequences of actions for preventing sea lion foraging and predation on salmonids at Willamette Falls in accordance with the National Environmental Policy Act. Public notice of the draft EA was published in the *Federal Register* on March 13, 1997 (62 FR 11845) with a 30-day public comment period. The proposed non-lethal actions, ranging from deterrence efforts to capture and removal, are authorized under section 109 of the MMPA which allows non-lethal removal of nuisance marine mammals by state and federal officials. NMFS determined that the California sea lions at the Willamette Falls are a "nuisance" because pinniped foraging in this area adversely affects fish passage and salmonids are especially vulnerable at this location to pinniped predation. Further, Willamette Falls is located in the freshwater environment far upriver and well outside the normal range and habitat of California sea lions. After consideration of public comments, NMFS completed a final EA that concluded that the non-lethal actions will not have a significant effect on the human environment. Notice of the final EA and responses to public comments was published in the *Federal Register* on January 2, 1998 (63 FR 55).

Report to Congress on Pinniped Impacts on Salmonids and U.S. West Coast Ecosystems

To address increasing concerns regarding the impacts of California sea lions and Pacific harbor seals on salmonids and, more broadly, on ecosystems along the U.S. West Coast, section 120(f) of the MMPA required NMFS to:

"conduct a scientific investigation to determine whether California sea lions and Pacific harbor seals

a) are having a significant negative impact on the recovery of salmonid fishery stocks which have been listed as endangered species or threatened species under the Endangered Species Act, or which the Secretary finds are approaching such endangered species or threatened species status; or

b) are having broader impacts on the coastal ecosystems of Washington, Oregon, and California."

Upon completion of the investigation, section 120 required NMFS to enter into discussions with the Pacific States Marine Fisheries Commission (PSMFC), on behalf of the states of California, Oregon, and Washington, to address any issues or problems identified as a result of the scientific investigation and to develop recommendations to address such issues. The recommendations from these discussions, along with the scientific investigation report, were to be made available to the public for review and comment for a period of 90 days, and then submitted to the U.S. House of Representatives' Committee on Resources and to the U.S. Senate Committee on Commerce, Science, and Transportation.

Scientific Investigation Report

An investigation into the existing scientific information addressing the issues identified by Congress was undertaken by a Working Group established by NMFS in 1994. It was determined at the onset of the investigation that NMFS did not have the resources nor was there sufficient time to conduct rigorous field investigations on the issues identified by Congress within the specified one-year time frame, so the investigation focused on a review of information from past field studies. The Working Group, consisting of NMFS and state biologists, was selected for their knowledge of salmonids, marine mammals, and the interactions between them. The Working Group compiled and reviewed all available information on the status and trends of California sea lions, Pacific harbor seals, and the seven species of salmonids found in Washington, Oregon, and California. Members of the Working Group also conducted several additional studies to augment existing information thereby extending completion of the report beyond the one-year time frame. NMFS published the final Working Group report in March 1997 as a part of the NOAA Technical Memorandum series entitled, "Investigation of Scientific Information on the Impacts of California Sea Lions and Pacific Harbor Seals on Salmonids and on the Coastal Ecosystems of Washington, Oregon, and California." The investigation concluded:

* California sea lion and Pacific harbor seal populations are robust, widely distributed and increasing at rates of 5-7% per year.

* Many salmonid stocks are declining or depressed; six salmonid populations were listed under the ESA at the time of the report and many others were either proposed for listing or candidates for listing.

* Pinnipeds did not cause the declines of salmonids listed under the ESA, but when salmonid populations decline to low levels, pinnipeds can affect recovery in some situations.

* Because of limitations in available data, the investigation did not result in conclusion that either pinniped species is having a significant negative impact on any wild salmonid population, except winter steelhead that migrate through the Ballard Locks.

* Although additional research is needed to fully address this issue, existing information on the seriously depressed status of many salmonid stocks is sufficient to warrant actions to remove pinnipeds in areas of co-occurrence where pinnipeds prey on depressed salmonid populations. Data collected from the Ballard Locks and in the Puntledge River in Canada clearly demonstrates that the combination of high local predator abundance during salmonid migrations, restricted passage, and depressed fish stocks can result in significant impacts on local salmonid populations.

* Pinnipeds cause damage to (or loss of) catch in commercial and recreational fisheries. There are many claims of pinnipeds, especially California sea lions, causing economic impact to fisheries especially in salmonid fisheries and in the southern California charter boat fishery.

* Data are lacking on assessing the impact of pinnipeds on coastal ecosystems.

Final Report to Congress on West Coast Pinnipeds

The final Report to Congress was completed in 1998, and it maintained the four basic recommendations to Congress. It will be submitted to Congress in February 1999. Public comments were summarized and responses to each are provided as an appendix to the final report. Congressional action on the Report is expected when Congress considers reauthorization of the MMPA.

In June 1996, NMFS began discussions with PSMFC and representatives of WDFW, ODFW, and California Department of Fish and Game. Using the information from the scientific investigation as a focus of discussions over the course of eight months, two issues were identified, and four recommendations were developed to possibly mitigate any impacts identified through the investigation. In February 1997, the discussions were completed, and NMFS drafted a report to Congress to recommend measures to address issues identified in the discussions with PSMFC and representatives of the coastal states. On March 28, 1997, NMFS published notice in the *Federal Register* (62 FR 14889) on the availability of the draft report to Congress for a 90-day public review and comment period.

Two issues on pinniped impacts on salmonids and U.S. West Coast ecosystems were identified and are described in the Report. They are as follows:

1) Pinniped Impacts on Salmonids - California sea lion and Pacific harbor seal populations on the West Coast have been increasing since passage of the MMPA in 1972, while many salmonid populations are decreasing. Salmonid populations that are depressed and declining, especially those that are listed or proposed to be listed under the ESA, can be negatively impacted by expanding pinniped populations and attendant predation.

2) Pinniped Impacts on West Coast Ecosystems - Increasing California sea lion and Pacific harbor seal populations and their expanding distribution are negatively impacting commercial and recreational fisheries, damaging private property, and posing threats to public safety.

The Report found that the lack of clear, integrated legislative guidance on resource use in combination with highly polarized constituencies on this issue, compound the difficulties of managing this situation for NMFS. Because of the limitations of the available data, the scien-

tific investigation did not result in a certain determination that either pinniped species (California sea lions or harbor seals) is having a significant negative impact on overall wild salmonid populations. The study did find that in several areas where fish passage is restricted, pinnipeds occur during salmonid migration. It was concluded however, that even though substantial additional research is needed to fully address this issue, existing information on the seriously depressed status of many salmonid stocks is sufficient to warrant actions to remove pinnipeds in areas where pinnipeds prey on depressed salmonid populations. In terms of the pinnipeds effects on coastal ecosystems, however, no conclusions can be drawn to adequately assess the impacts.

The Report also found that there may be conflicts among provisions of environmental legislation. It also recognized the need for immediate management action and/or active (inseason, in-situ) management in certain situations. NMFS recognizes the risk of loss of biodiversity and the need to preserve present and future options in terms of declining salmonid populations. The loss of the remaining members of endangered salmonid populations must be weighed against the loss of a small number of pinnipeds from large, healthy populations. NMFS is also aware that there is a risk-averse approach to protecting salmonid stocks and contributing to their recovery.

Although waiting for scientific certainty before instituting management actions can lead to management failures, numerous questions must be answered about the ultimate effects that pinniped populations are having on the recovery of declining salmonid species and the entire coastal ecosystem. As both human and pinniped populations continue to grow and to demand more from coastal resources, conflicts between them are likely to increase as well. This trend suggests that active management will become increasingly important to reduce damage and conflict between humans and common species.

The Report contains four major recommendations:

1) Implement Site-specific Management for California Sea Lions and Pacific Harbor Seals.

2) Establish a framework that would allow state and federal resource management agencies to immediately address conflicts involving California sea lions and Pacific harbor seals.

Any lethal takings would have to be within the Potential Biological Removal levels established by NMFS for all human causes of mortality. The three components of the framework are:

a) In situations where California sea lions or Pacific harbor seals are preying on salmonids that are listed or proposed for listing under the ESA, immediate use of lethal removal by state or Federal resource agency officials would be authorized;

b) In situations where California sea lions or Pacific harbor seals are preying on salmonid populations of concern to the state or are impeding passage of these populations during migration as adults or smolts, lethal takes by state or federal resource agency officials would be authorized if:

(i) non-lethal deterrence methods are underway and are not fully effective, or

(ii) non-lethal methods are not feasible in the particular situation or have proven ineffective in the past; and

c) In situations where California sea lions or Pacific harbor seals conflict with humans, such as at fishery sites and marinas, lethal removal by state or federal resource agency officials would be authorized as a last resort when an individual pinniped fails to respond to repeated deterrence attempts, or when repeated deterrence attempts do not affect the behavior of an individual pinniped over the long-term.

2) Develop Safe, Effective Non-lethal Deterrents.

In order to provide an array of options broader than lethal removal to resolve West Coast pinniped problems, there is a pressing need for research on the development and evaluation of deterrent devices and further exploration of other non-lethal removal measures. Potential options need to be evaluated in a concerted, adequately-

funded effort to address this issue. Research and development of pinniped deterrence methods should be a research priority for addressing expanding pinniped populations on the West Coast.

3) Selectively Reinstating Authority for the Intentional Lethal Taking of California Sea Lions and Pacific Harbor Seals by Commercial Fishermen to Protect Gear and Catch.

Prior to the 1994 Amendments to the MMPA, commercial fishermen were allowed to lethally remove certain pinnipeds as a last resort in order to protect their gear or catch. Although the 1992 NMFS' legislative proposal contained provisions to continue such authority, they were not included in the 1994 Amendments to the MMPA. Congress should reconsider a limited authorization, based on demonstrated need, for certain commercial fishermen at specified sites to use lethal means, as a last resort, to protect their gear and catch from depredation by California sea lions and Pacific harbor seals until such time that effective non-lethal methods are developed for their specific situation.

4) Information Needs.

An array of additional information is needed to better evaluate and monitor California sea lion and Pacific harbor seal impacts on salmonids and other components of the West Coast ecosystems. Details of such studies are described in the draft Report to Congress. There is a suite of research needs to answer the questions regarding pinniped impacts to salmonids and coastal ecosystem and NMFS' recommendations. These reflect the need to take management actions immediately in those cases where continued pinniped predation could result in continued loss of individuals within severely depleted salmonid runs. Further, additional research and development should be directed into this arena, but not instead of active management where the situation is deemed critical.

The issue of resolving pinniped problems on the U.S. West Coast is certainly controversial; consequently, NMFS received thousands of comments on the draft Report to Congress. Many letters were not responses to the actual draft report, but were part of campaigns by marine mammal protection groups against any or all actions toward sea lions. Although some of the comments supported NMFS' recommendations, many were opposed. This polarity of comments on the recommendations ensures that the reauthorization of the MMPA in 1999 will be controversial, particularly concerning these recommendations as a balanced way of resolving specific pinniped conflicts on the West Coast of the United States consistent with the MMPA goal of maintaining all marine mammals at optimum sustainable population levels.

Cooperative State/Federal Program on Expanding Pinniped Populations

In 1998, NMFS initiated a coordinated coast-wide program with the U.S. West Coast states to address the expanding pinniped issue. The program components included pinniped population assessments, fishery interactions, and predation on ESA-listed salmonids. To affect a coordinated, concerted effort on the issue of pinniped predation on salmonids, U.S. West Coast pinniped and salmonid biologists worked together to develop sampling plans and field studies for several river systems that were designed to provide the information needed to assess pinniped impacts on salmonids. Pinniped-salmonid studies were conducted by NMFS, WDFW, University of Washington, ODFW, Yurok Tribe, and Moss Landing Marine Laboratories in Washington, Oregon, and California. Study sites included the Columbia River; Hood Canal, WA; Ozette River, WA; Alsea River, OR; Umpqua River, OR; Rogue River, OR; Klamath River, CA; Scott Creek, CA; and San Lorenzo River, CA. The 1998 field studies will culminate with a workshop in April 1999 where the field and analytical methodologies will be discussed and critiqued, and study plans for 1999 field studies developed.

Gulf of Maine Pinniped-Fishery Interaction Task Force

As a result of increasing pinniped populations interacting with human activities, one of which is aquaculture, the MMPA Amendments of 1994 included section

120(h), which required NMFS to convene a task force to provide advice on issues or problems regarding pinnipeds interacting in a dangerous or damaging manner with aquaculture resources in the Gulf of Maine. The Gulf of Maine Pinniped-Fishery Interaction Task Force members were selected from the aquaculture industry, State governments, the scientific community, and conservation organizations. The Task Force was established in January 1995 and met three times for multi-day meetings, visited pen-sites, conducted public hearings, met with salmonid growers, conducted surveys, and reviewed literature related to the issue, prior to completion of its report.

In February 1996, the Task Force submitted its final report to NMFS. The report contained consensus Task Force recommendations to mitigate the pinniped predation. NMFS used the Task Force's recommendations and comments received from the public to prepare its proposed recommendations to the U.S. Congress. The draft report recommended options available to mitigate the pinniped-aquaculture interactions. It was completed on March 17, 1997 (62 FR 12602) and was made available for a 30-day public review and comment period. Highlights of the draft report included the following recommendations:

1) The aquaculture industry needs to develop a reporting system to substantiate its claims of damage by pinnipeds, develop and implement standards to prevent damage by predators, take advantage of government assistance in developing deterrence strategies, and develop marketing strategies to help make future losses more sustainable;

2) Congress should clarify whether or not it intended that the lethal take provisions in the MMPA section 109(h) be applied to the situation when a marine mammal gets inside a net-pen; and

3) NMFS reiterates its support of the intentional lethal take provision included in its 1992 legislative proposal and recommends that Congress re-examine the need for intentional lethal taking under the MMPA.

In response to public comments, the report has been modified to state that NMFS does not have the authority under the MMPA section 109(h) to lethally remove pinnipeds that are discovered within net-pens and to focus the recommendations regarding lethal removal on the specific charge within the MMPA section 120(h) rather than on the broad issue of management of abundant pinniped populations.

Recommendations in the final report include the following:

• The salmonid aquaculture industry in the Gulf of Maine should collect data on the extent of the impacts experienced by seal attacks on net-pens. The data should include documenting damages caused by the seals, as well as, resources diverted from production to work on the seal predation problem.

• The primary responsibility for preventing and mitigating the effects of seal attacks on aquaculture resources in the Gulf of Maine should rest on the industry itself. The research and development of deterrence/prevention technologies must be initiated by the industry.

• NMFS has resources that may help resolve the seal predation problem. NMFS has expertise in the behavior and biology of marine mammals, the engineering and design of fishing gear, and other related fields. NMFS, if approached by the industry, may be able to apply these areas of expertise to this relatively new problem. Furthermore, NMFS funds grant programs to which industry proponents may apply for funds to support research and development intent on resolving the seal predation problem.

• At the request of the industry, NMFS will investigate the predator control measures in use in other salmonid produce countries and will consider the applicability of the MMPA section 102(c)(3), by which NMFS could halt the importation of salmonid products from nations that allow practices inconsistent with the MMPA.

• In the rare event that a seal is discovered to have entered the confines of a net-pen, the grower is left in an intolerable situation that seems to have no legal means of resolution. NMFS believes that lethal methods may be necessary to resolve this and other situations.

NMFS forwarded the report to the Department of Commerce, which then transmitted the Report to Congress on August 1, 1997.

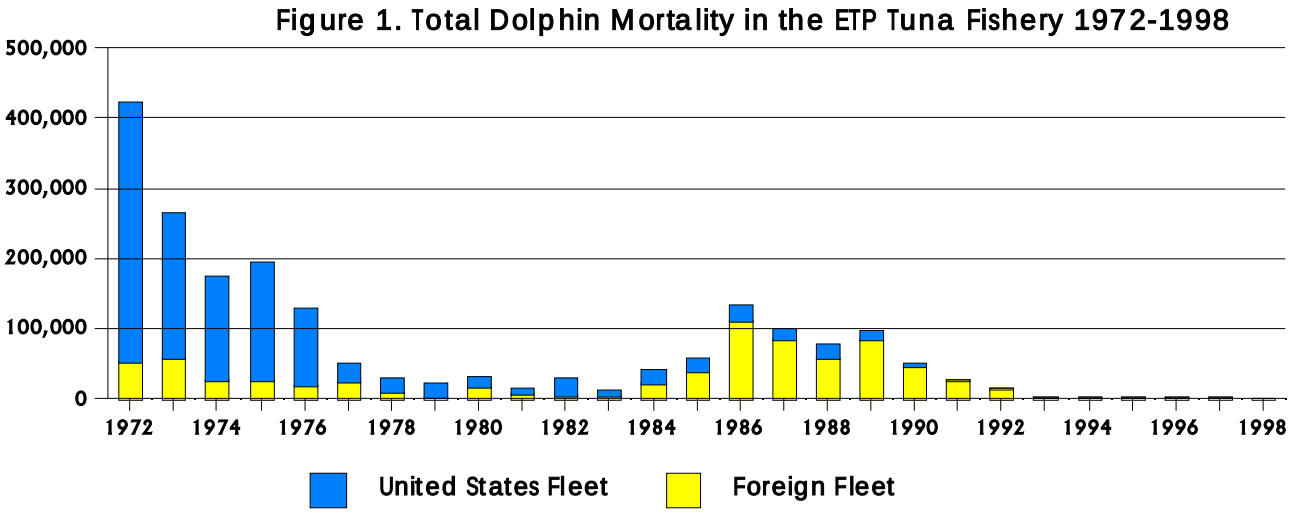
Chapter V. Dolphin Interactions with Commerical Fisheries in the Eastern Tropical Pacific Ocean

NMFS file photo

The Marine Mammal Protection Act (MMPA) was enacted in 1972, due in large part to public reaction to the high levels of dolphin mortality caused by the yellowfin tuna purse seine fishery in the eastern tropical Pacific Ocean (ETP). In the late 1950s, fishermen began using the as yet unexplained association between schools of large yellowfin tuna and schools of certain species of dolphin to locate and capture tuna. Observer records of mortality begin in 1972 with the enactment of the MMPA. At that time, the ETP fishery was dominated by U.S. vessels, and annual mortality was estimated at over 350,000 dolphins. With enactment of the MMPA, incidental mortality from fishing by the U.S. domestic fleet began to decline, but participation in the fishery by foreign vessels began to increase. Although the U.S. industry was instrumental in developing gear and procedures for reducing mortality and for releasing animals, foreign vessels were not subject to the requirements of the MMPA, and international fleet mortality, although reduced by procedures and gear developed by U.S. vessels, began to rise as a result of the increase in the number of foreign vessels (see Appendix C: Estimates of Total Incidental Dolphin Mortality for U.S. and Foreign Purse Seine Vessels in the Eastern Tropical Pacific Ocean, 1971-1998).

To address the concern regarding increased mortality by foreign vessels, the U.S. Congress amended the MMPA in 1984 to tighten the importation requirements for fish and fish products harvested by foreign tuna vessels in the ETP. The 1984 amendments to the MMPA required that nations exporting yellowfin tuna to the United States have in place a regulatory program for marine mammal protection comparable to that of the United States, and achieve an incidental mortality rate for dolphins in the yellowfin tuna fishery comparable to that of the United States. Those amendments also set a mortality limit of 250 coastal spotted dolphins *(Stenella attenuata)* and 2,750 eastern spinner dolphins *(Stenella longirostris)* for the U.S. fleet in the ETP fishery.

In 1988, Congress again amended the MMPA. Statistics for 1987 showed mortality incidental to foreign fishing effort at 85,185 for the year, while U.S. mortality was under 13,992. By imposing additional requirements on domestic and foreign tuna fishermen, Congress expected that overall mortality would decrease. Those amendments retained the annual quota of 20,500 dolphins killed or seriously injured during the purse seining operations of the U.S. tuna fleet in the ETP, but also



added additional requirements applicable to the U.S. fleet. The amendments also clarified what the Secretary of Commerce must consider when determining whether a foreign nation is taking measures comparable to those of the United States in protecting dolphin in the ETP fishery. These included the same prohibitions that were applicable to U.S. vessels and set specific limits on total dolphin mortality and the percentage of eastern spinner and coastal spotted dolphins in the total mortality.

The 1988 amendments to the MMPA also required certification under the Pelly Amendment for those nations not meeting the comparability requirements of the MMPA for a period of six months. The embargoes that resulted from the MMPA requirements were challenged by other countries as being inconsistent with the General Agreement on Tariffs and Trade (GATT). Although never formally adopted by the GATT, a panel report found the United States' embargoes to be inconsistent with GATT.

In 1990, Congress passed the Dolphin Protection Consumer Information Act (DPCIA). The DPCIA required that tuna labeled as "dolphin-safe" meet certain criteria. Under the definition, all tuna harvested in the ETP on a trip where there was any intentional encirclement of dolphins could not be considered "dolphin-safe." The DPCIA did not prohibit tuna that did not meet the dolphin-safe labeling requirements from being imported, but U.S. tuna canners instituted a voluntary dolphin-safe tuna campaign where they purchased only dolphin-safe tuna for introduction to the U.S. market.

The International Dolphin Conservation Act (IDCA) was passed in 1992, with the intent to establish an international moratorium on the practice of harvesting tuna through the use of purse seine nets deployed on or to encircle dolphins or other marine mammals. The United States was not successful in getting any nation to commit to such a moratorium. However, the IDCA limited U.S. dolphin mortality to 1,000 dolphins for 1992 and 800 for the period between January 1, 1993, and March 1, 1994. The IDCA required that the number of dolphins killed or seriously injured decrease from one year to the next. Estimated U.S. dolphin mortality decreased from 19,712 animals in 1988, to 1,004 in 1991, less than 500 in 1992, and 115 in 1993. Because the IDCA required that authorized U.S. mortality decrease each year, the U.S. ETP yellowfin tuna fishery was closed on February 8, 1994, when the incidental dolphin mortality was approaching 115. The IDCA prohibited U.S. citizens from intentionally encircling marine mammals and made it unlawful for any person to sell non-dolphin safe tuna in the United States after June 1, 1994. However, foreign participation in the ETP fishery continued to increase, and mortality was managed under the voluntary international dolphin conservation program supported by the Secretariat of the Inter-American Tropical Tuna Commission (IATTC).

The La Jolla Agreement and the Panama Declaration

While U.S. participation in the ETP tuna fishery declined significantly as a result of the MMPA prohibitions on encircling dolphins (only a few dolphin-safe vessels remained in the fishery), foreign participation in the fishery continued. In the fall of 1992, the nations participating in this fishery convened at the annual meeting of the IATTC and signed the La Jolla Agreement. That Agreement placed voluntary limits on the maximum numbers of dolphin that could be incidentally killed annually in the fishery, lowering the maximum each year over seven years, with a goal of eliminating mortality in the fishery. The United States and the governments of Belize, Colombia, Costa Rica, Ecuador, France, Honduras, Mexico, Panama, and Spain, whose vessels fish for tuna in the ETP or have coastlines bordering the ETP, came together again in 1995 and negotiated the Panama Declaration.

The Panama Declaration initiative was the result of the efforts of five environmental organizations, the Center for Marine Conservation, Greenpeace International, World Wildlife Fund, National Wildlife Federation, and the Environmental Defense Fund, who negotiated an initial draft with Mexico and the other nations in the fishery. Because the multi-nation yellowfin tuna fleet fishes in international waters, a binding international agreement is key to successfully protecting dolphins. The signing nations agreed that, contingent on the United States amending provisions of the MMPA for those countries participating in the international dolphin conservation program in the ETP, they would enter into a binding international agreement for the continued protection of dolphin and the entire ETP ecosystem. The Panama Declaration set the stage for the establishment of conservative species/stock specific annual dolphin mortality limits and represents an important step toward reducing bycatch in commercial fisheries with sound ecosystem management.

The Panama Declaration contains provisions for additional protection for individual stocks of dolphins and for other living marine resources, to achieve an ecosystem approach to management of the fishery. The signatory nations expected that, as a result of their actions in reducing dolphin mortality, the United States would amend its laws so their participation in the International Dolphin Conservation Program would satisfy comparability requirements of U.S. law and result in the lifting of embargoes on yellowfin tuna and yellowfin tuna products. Total dolphin mortality by the international fleet for 1997 was 3,000 dolphins, a level considered non-threatening to dolphin stocks. Until implementation of the IDCPA, however, prohibitions on the importation of the ETP purse seine-harvested yellowfin tuna from Colombia, Mexico, Panama, Vanuatu, Belize, and Venezuela remain in place, as well intermediary nation embargoes on all yellowfin tuna from Costa Rica, Italy, and Japan.

The International Dolphin Conservation Program Act (IDCPA)

In response to the Panama Declaration, Congress passed the IDCPA in August 1997. This Act amended the import provisions of the MMPA to allow yellowfin tuna to be imported from IATTC member nations that fish in compliance with the international dolphin conservation program. These amendments to the MMPA would not become effective until a binding international agreement was adopted and in force. A number of environmental organizations, including the Center for Marine Conservation and the World Wildlife Fund, supported passage of the legislation. Contingent upon the results of research into the effects of chase and encirclement on depleted dolphin stocks, the legislation would change the definition of dolphin-safe (for tuna harvested by large purse seine vessels in the ETP) to mean tuna caught in a set without any observed dolphin deaths or serious injury, rather than tuna caught without intentionally encircling dolphins on any set during an entire trip by the purse seine vessel.

The IDCPA is the United States' domestic response to the Panama Declaration. The IDCPA provides the basis for entry into the United States of yellowfin tuna that would otherwise be under embargo because it was harvested by vessels of countries that allow intentional encircling of marine mammals, provided the harvesting nation provides documentary evidence of its participa-

tion in the International Dolphin Conservation Program, its compliance with the Program, and its membership in the IATTC. The IDCPA will also allow U.S. fishing vessels to again participate in the ETP yellowfin tuna fishery by making sets on dolphins. Under a set of regulations to avoid dolphin mortality, U.S. citizens crewing on the vessels of other nations fishing in the International Dolphin Conservation Program will be allowed to take marine mammals during fishing operations outside of the U.S. exclusive economic zone without being in violation of the take prohibitions of the MMPA.

Under the IDCPA, the definition of dolphin-safe tuna would change immediately for non-ETP caught tuna, and for the ETP caught tuna if certain findings, based on Congressionally-mandated research, are made. In the absence of significant scientific data supporting a finding that the process of chasing and encircling dolphin schools in the pursuit of tuna in the ETP is adversely affecting depleted dolphin stocks, dolphin-safe labeling in the United States will change in 1999.

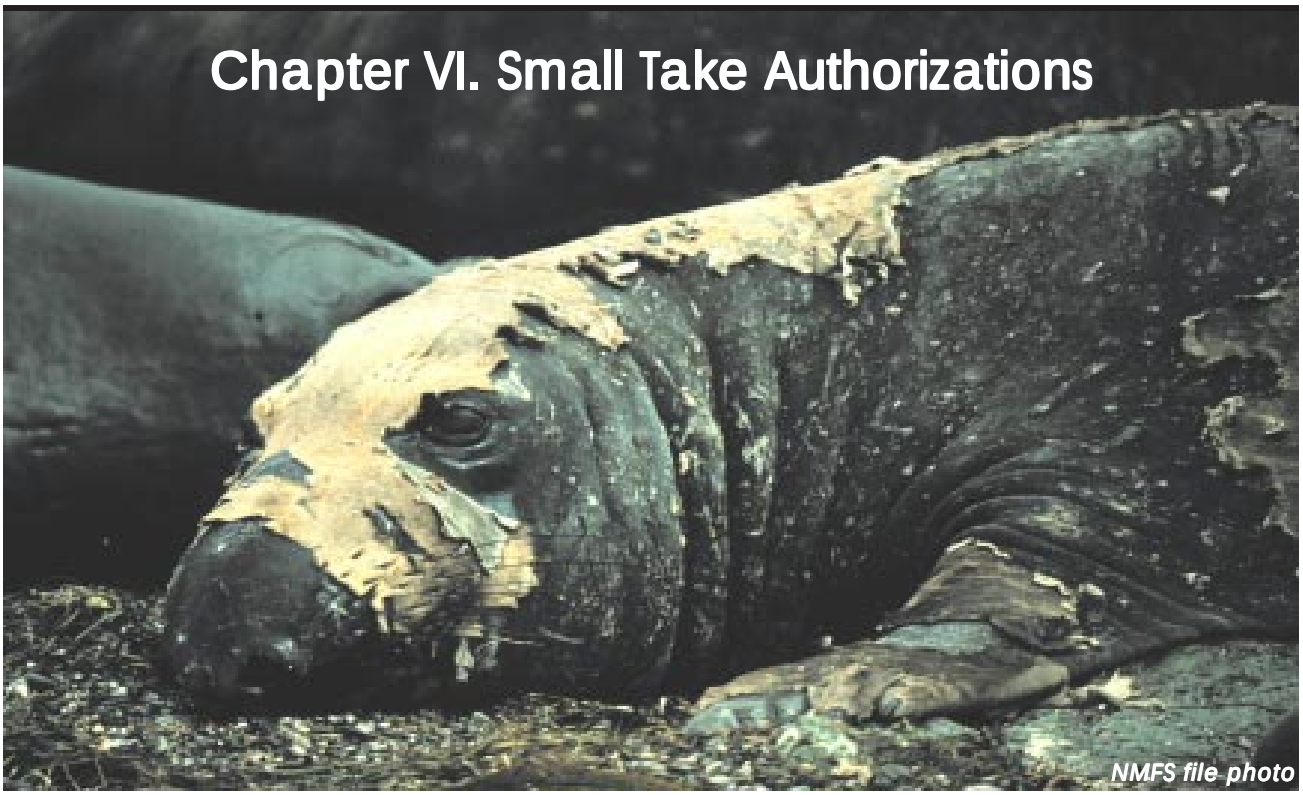
Unless the Secretary of Commerce determines, on the basis of that research and other relevant information, that intentional chase and encirclement of dolphins is having a significant adverse impact on a depleted dolphin stock in the ETP, the standard of dolphin-safe tuna, with respect to tuna harvested in the ETP by purse seine vessels with carrying capacities over 400 short tons, would change so that tuna harvested in a set where there is no observed dolphin mortality or serious injury would be considered "dolphin-safe." This contrasts with the 1990 definition, which says that no tuna harvested during an entire trip is considered "dolphin safe" if there was an intentional encirclement of dolphins during any portion of the trip.

The IDCPA provides enhanced protection for dolphins and enhanced attention to the conservation of ecosystems and the sustainable use of living marine resources related to the tuna fishery in the ETP. However, the provisions of the IDCPA will become effective after two certifications are made. The Secretary of State must certify to Congress that a binding legal instrument establishing the Agreement on the International Dolphin Conservation Program has been adopted and is in force, and the Secretary of Commerce must certify that research has begun on the effects of intentional chase and encirclement on ETP dolphins, and that funds are available to complete the first year of the study.

The International Agreement

In May 1998, eight nations, including the United States, negotiated a binding, international agreement to implement the international dolphin conservation program. The Agreement will officially enter into force when four countries ratify it.

Chapter VI. Small Take Authorizations



NMFS file photo

Since 1982, the Marine Mammal Protection Act (MMPA) has provided a mechanism for authorizing, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified, lawful, activity (other than commercial fishing) for periods not to exceed five years per authorization. Before issuing regulations that allow the takes, NMFS must determine that the takes (harassment, injury or mortality) will not have more than a negligible impact on the species requested to be taken and will not have an unmitigable adverse impact on the availability of the species for subsistence hunting. Regulations issued in 1982, and amended in 1989 to allow the taking of threatened and endangered marine mammal species, require the applicant to mitigate the taking to the lowest level practicable, to monitor the taking of marine mammals during the activity, and to report the results to NMFS.

Small Take Authorizations

At the start of 1998, two activities had multi-year authorizations to incidentally take marine mammals under this provision of the MMPA. The authorized activities were: (1) the taking of bottlenose *(Tursiops truncatus)* and spotted dolphins *(Stenella attenuata)* incidental to the removal of oil and gas structures in the Gulf of Mexico and (2) the taking of a number of species of marine mammals during U.S. Navy ship shock trials off southern California. However, no Letters of Authorization (LOAs) were issued during 1998 for conducting ship shock trials off southern California.

In 1998, NMFS received one new application for takings incidental to specified activities, completed authorizations for two activities, and continued action on three other applications. These activities are described below.

U.S. Navy Seawolf Shock Trial Application

On June 7, 1996, NMFS received a request from the U.S. Navy for a small take of marine mammals incidental to shock testing the USS SEAWOLF submarine in the waters offshore Norfolk Virginia or Jacksonville, Florida in the summer of 1997. The U.S. Navy proposed to shock test the USS SEAWOLF by detonating a 10,000-lb (4500 kg) explosive charge near the submarine once per week over a five-week period, between May

1 and September 30, decreasing the distance between submarine and explosive each time. Detonations would occur 100 ft (30 m) below the ocean surface in a water depth of 500 ft (150 m). The USS SEAWOLF would be underway at a depth of 65 ft (19.5 m) at the time of the test. For each test, the submarine would move closer to the explosive so the submarine would experience a more severe shock.

On August 2, 1996, NMFS released for public comment proposed regulations that, if implemented, would authorize the harassment, injury and mortality of a small number of marine mammals incidental to the U.S. Navy's shock trial. The proposed rule contained measures for assuring minimal loss of marine mammal life and requirements for aerial, shipboard, and acoustic monitoring of the planned detonations. Due to a delay in the test program, the U.S. Navy has requested the date of the five-year rule not become effective until the year 2000. A final rule authorizing the U.S. Navy to conduct the shock trial between 2000 and 2004, provided the required mitigation, monitoring and reporting requirements are implemented, was published on December 1, 1998 (63 FR 66069). An LOA is not expected to be issued until a date for testing has been established by the U.S. Navy.

Marine Mammal Takings Incidental to On-Ice Seismic Operations in the U.S. Beaufort Sea, Alaska

On February 2, 1998, NMFS issued a final rule (63 FR 5277) to renew the authorization for the incidental taking of a small number of ringed seals *(Phoca hispida)* and bearded seals *(Erignathus barbatus)* incidental to winter seismic operations in the Beaufort Sea. Seismic surveys will be conducted using a Vibroseis energy source, wherein large trucks with vibrators mounted on them, systematically put variable frequency energy into the earth. Because a minimum of three to 4 ft (1.2 m) of ice is required to safely support the weight of equipment, on-ice seismic operations are usually confined to the five-month period between January through May. Seals are expected to avoid the immediate area around seismic operations; therefore, they are not expected to be subject to potential hearing damage from exposure to underwater sounds from the operations. Any takings of seals are anticipated to result from short-term disturbance by noise and physical activity associated with the seismic operations. Regulations governing the taking of ringed and bearded seals incidental to on-ice seismic surveys will remain in effect until December 31, 2002. LOAs to take ringed and bearded seals incidental to on-ice seismic operations in the Beaufort Sea off Alaska were issued on March 16, 1998, to BP Exploration, Western Geophysical, and Northern Geophysical, all of Anchorage, Alaska.

North Atlantic Energy Service Corporation: Taking Seals Incidental to Seabrook Power Plant Operations

On June 16, 1997, NMFS received an application for an incidental, small take exemption from the North Atlantic Energy Service Corporation to take harbor seals and other pinnipeds incidental to routine operations of its Seabrook Station nuclear power plant. Seabrook is a single-unit 1,150-megawatt nuclear power generating facility located in Seabrook, New Hampshire. Cooling water for plant operations is supplied by three intake structures approximately one mile offshore in 60 ft (18 m) of water. About 469,000 gal (178,220 l) per minute are drawn through the intakes to a 19 ft (5.7 m) diameter, three-mile (0.9 m) long tunnel beneath the seafloor and into large holding bays (called forebays) at the power plant. Lethal takes of seals occur sporadically as the juvenile seals enter the cooling water intake structures and apparently drown *en route* to the forebays. On August 25, 1998, NMFS published a proposed rule for this action in the *Federal Register* (63 FR 45213).

Though Seabrook Station has been in commercial operation since August 1990, no seal takes were known to have occurred prior to 1993, when the remains of two seals were discovered. In 1994, the remains of seven seals were found and, in 1995, the remains of six to seven were found. In 1996, 12 to 17 animals were taken and, in 1997, ten seals were taken at the facility. Lethal takes for 1998 totaled 13 seals. North Atlantic Energy Service Corporation is presently investigating a number of measures to prevent or reduce the lethal taking of seals at Seabrook Station. As of the end of 1998, no preventative measures have been implemented, but some alternatives warrant further study. These alternatives are being reviewed for practicality with regard to nuclear power safety, costs, and ability to withstand the high energy offshore environment. A final rule is expected to be published in early 1999.

U.S. Coast Guard (USCG) Large Whale Ship-Strike Application

On May 31, 1995, NMFS received an application for a small take exemption from the USCG in order to allow a small take of certain marine mammal species incidental to USCG vessel and aircraft operations off the U.S. Atlantic shoreline. The application was in response to a federal court order dated May 2, 1995 (as revised by an order dated May 19, 1995) in Strahan v. Linnon, wherein the presiding District Court judge ordered the USCG to apply for a small take permit for Coast Guard operations that may incidentally take a northern right whale *(Eubalaena glacialis)*. The USCG also requested a small take of humpback *(Megaptera novaeangliae)*, blue *(Balaenoptera musculus)*, fin *(Balaena physalus)*, sei *(Balaenoptera borealis)* and sperm whales *(Physeter macrocephalus)*. Specific activities covered in the application are the operation of USCG vessel and aircraft activities in the North Atlantic, including responses to marine pollution events, port safety and security issues, law enforcement efforts, search and rescue missions, vessel traffic control, and maintenance of aids to navigation.

Before processing this application, NMFS determined that it would be necessary to first complete consultation under section 7 of the Endangered Species Act. The USCG submitted an ESA Biological Assessment for the U.S. Atlantic Coast on August 3, 1995, and NMFS issued a Biological Opinion on September 15, 1995. As a result of an October 9, 1995, humpback whale strike in the Gulf of Maine and an interaction with a humpback whale in July 1997, the USCG requested re-initiation of consultation on February 22, 1996 and December 11, 1997. That process was concluded on July 22, 1996 and June 8, 1998, respectively. During the time period for consultation, processing the USCG application for a small take authorization was suspended.

Because the finding of the July 22, 1996, section 7 consultation was that continued vessel and aircraft operations by the USCG are likely to jeopardize the continued existence of northern right whales *(Eubalaena glacialis)*, and because NMFS has determined that the loss of even a single northern right whale is significant, a negligible impact finding under section 101(a)(5)(A) could not be made for ship strikes of northern right whales by the USCG. As a result, the USCG's June 2, 1995, application for a small take authorization for northern right whales was denied by letter on July 31, 1996. The requested authorization for the additional species of marine mammals incidental to USCG operations was not addressed at that time.

In fall of 1996, the presiding District Court judge in Strahan v. Linnon expressed concern with NMFS' actions on the small take application and other marine mammal authorizations. On October 17, 1996 (61 FR 54157) NMFS announced receipt of the USCG application and offered the public 30 days to submit comments. However, prior to issuance of a proposed rule, in July 1997, a USCG cutter had an interaction with a whale, believed to be but not positively identified as a humpback whale *(Megaptera novaeangliae)*. As a result of the interaction, consultation with the USCG was reinitiated and concluded on June 8, 1998. As of the end of 1998, no further action had been taken on the USCG application.

Taking of Harbor Seals and Other Pinnipeds Incidental to Missle and Rocket Launches at Vandenburg, Air Force Base, California

The U.S. Air Force 30th Space Wing applied on September 30, 1997, for a five-year authorization to take harbor seals *(Phoca vitulina)*, California sea lions *(Zalophus californianus)* and other pinnipeds incidental to launches of missiles and rockets from Vandenberg Air Force Base, as well as aircraft and helicopter testing. This application is for the continuation of a multi-year authorization that was issued between the years 1991 and 1996 for Titan IV launches, but expanded to include other launch activities, all of which have been covered under incidental harassment authorizations between 1995 and 1998. On July 21, 1998, NMFS published proposed regulations (63 FR 39055) that, if implemented, would authorize the 30th Space Wing to take small numbers of these animals annually by the listed activities. A final rule is expected to be published in early 1999.

To ensure that the cumulative impact of these launches would not have more than a negligible impact on pinnipeds along the Vandenberg coastline and on the North-

ern Channel Islands, on-site monitoring of affected rookeries and haulouts would be conducted and, in addition, a multi-year research program would be initiated.

Taking of Bowhead Whales and Other Marine Mammals Incidental to Construction of Oil Development Projects in the U.S. Beaufort Sea

On November 30, 1998, BP Exploration (Alaska) (BPXA) applied to NMFS for a small take of marine mammals incidental to the construction and operation of offshore oil and gas platforms at the Northstar and Liberty developments in the Beaufort Sea in state and Federal waters. BPXA proposes to produce oil from these two offshore oil developments, which will be the first in the Beaufort Sea to use a subsea pipeline to transport oil to shore and then into the Trans-Alaska Pipeline System. Because both construction and operation of offshore projects may result in the incidental harassment of marine mammals, principally by noise due to vessel and helicopter traffic, ice road and pipeline construction and drilling and gas flaring activities, a small take authorization is warranted. An advance notice of proposed rulemaking is expected to be published in early 1999.

Small Takes by Incidental Harassment

Section 101(a)(5) of the MMPA was amended by the MMPA Amendments of 1994 (Public Law 103-238) to establish an expedited process by which citizens of the United States can apply for an authorization to incidentally take small numbers of marine mammals by harassment. It established specific time limits for processing the application, for public notice and comment on the application and for issuance or denial of the authorization.

On April 10, 1996 (61 FR 15884), NMFS published an interim rule to amend the small take regulations to implement the process for issuing harassment authorizations without the need to issue specific regulations governing the taking of marine mammals for each and every activity. This rule sets forth the process for applying for and obtaining an authorization; the time limits set by the statute for NMFS review, publication, and public notice and comment on any applications for authorization that would be granted; and the requirements for submission of a plan of cooperation and for scientific peer review of an applicant's monitoring plans (if that activity may affect the availability of a species or stock of marine mammal for taking for subsistence purposes).

During 1998, under these new small take provisions, NMFS accepted applications from, and issued authorizations to, the following activities:

Conducting 3-D Seismic Surveys in the U.S. Beaufort Sea, Alaska BPXA and Western Geophysical

On March 26 and April 15, 1998, NMFS received applications from BPXA and Western Geophysical requesting authorizations for the harassment of small numbers of several species of marine mammals, principally bowhead whales (*Balaena mysticetus*), incidental to conducting ocean-bottom-cable seismic surveys during the open water season of 1998 in the U.S. Beaufort Sea. The purpose of the surveys is to refine assessments of petroleum reserves prior to developing those reserves.

The number of potential incidental harassment takes will depend on the distribution and abundance of marine mammals (which vary annually due to variable ice conditions and other factors) in the area of seismic operations. In addition, no take by injury and/or death was anticipated, and the potential for temporary or permanent hearing impairment would be avoided through incorporation of mitigation measures. These measures included a shutdown protocol when marine mammals enter a predesignated safety zone, ramping up the source whenever it is powered down for more than one minute, requiring biological observers to monitor safety zones, and aerial and acoustic monitoring after September 1, 1998 to look for bowhead whales.

Subsequent to a 30-day public comment period, BPXA requested NMFS to withdraw its application for the incidental harassment authorization. This was done on July 29, 1998. After review of both the documentation provided by Western Geophysical and that of the commenters, NMFS determined that the short-term

impact of conducting seismic surveys in the Beaufort Sea would result, at worst, in a temporary modification in behavior by bowhead whales and certain other species of cetaceans and pinnipeds. While behavioral modifications may be made by these species to avoid the resultant noise, this behavioral change is expected to have a negligible impact on the animals. As a result, an incidental harassment authorization was issued to Western Geophysical for the open-water season commencing on July 23, 1998.

Because bowhead whales are east of the seismic area in the Canadian Beaufort Sea until late August/early September, seismic activities were not expected to impact subsistence hunting of bowhead whales prior to that date. After September 1, 1998, Western Geophysical initiated aerial survey flights for bowhead whale assessments. In addition, appropriate mitigation measures to avoid an adverse impact on the availability of bowhead whales for subsistence needs were the subject of consultation between Western Geophysical and Inupiat subsistence users.

U.S. Coast Guard Authorization to Harass Small Numbers of Seals and Sea Lions Incidental to Removal of Oil Storage Tanks on Tatoosh Island, Washington

On April 27, 1998, NMFS received a request from the USCG for authorization to take small numbers of California sea lions, Pacific harbor seals, and Steller sea lions *(Eumetopias jubatus)* by harassment incidental to removing up to five underground oil storage units at the Cape Flattery Light Station on Tatoosh Island, Clallam County, WA. The expected impact on marine mammals would be from the noise created by the arrival and departure of heavy-lift, tandem-rotor helicopters. Heavy-lift helicopters will be used to sling equipment and materials to and from the project. After publication of a proposed authorization on June 4, 1998 (63 FR 30476), NMFS issued an incidental harassment authorization to the USCG on August 17, 1998 (63 FR 45048).

Authorization for Takings Incidental to Anti-mine Warfare Experiments by the U.S. Navy at Eglin Air Force Base, Florida

On July 20, 1998, NMFS received an application from the U.S. Air Force Development Test Center. The U.S. Air Force, in cooperation with the U.S. Naval Surface Warfare Center-Coastal Systems Station, requested an authorization to take, by harassment and non-serious injury, bottlenose dolphins *(Tursiops truncatus)*, spotted dolphins *(Stenella attenuata)*, and possibly other cetacean species incidental to explosive testing of obstacle and mine clearance systems at Eglin Air Force Base in Florida. The U.S. Navy's current capability to clear obstacles and mines in the surf zone is limited to the hand placement of explosive charges by U.S. Navy combat swimmers. The effectiveness of this capability is limited by the ability of swimmers to locate submerged targets and to carry sufficient explosives to destroy the targets. Such operations are considered highly hazardous, and the reliability of obstacle removal is considered to be poor. To facilitate U.S. Marine Corps amphibious assaults, the U.S. Navy is developing and testing methods to safely and effectively clear a path through such obstacles. Because the experiments can result in noise in the marine environment, and the incidental harassment of cetaceans in the vicinity, the U.S. Air Force applied for an incidental harassment authorization. In order to avoid impacting sea turtles, tests are proposed to be conducted in the fall and winter 1998/99. Additional mitigation measures that will be undertaken include: (1) establishing safety zones to prevent marine mammal injury; (2) conducting a 30-minute pre-detonation aerial monitoring survey immediately prior to each test to ensure no marine mammals are within the test area's designated safety zone; (3) not testing if marine mammals, sea turtles or sargassum rafts are within the designated safety zone; and (4) not testing if sea state conditions are greater than three and water clarity is not adequate for conducting surveys. With water depths less than 18 m (59 ft), low turbidity, and white sand bottom, exceptional marine mammal visibility is ensured.

A notice of receipt of the application and proposed authorization was published on October 13, 1998 (63 FR 54676) and, after a 30-day public comment period, the authorization was issued on December 8, 1998 (63 FR 67669).

McNeil Island, Washington Dock Construction

An incidental harassment authorization was issued on December 23, 1998 (63 FR 72285), to allow the Washington State Department of Corrections to harass harbor seals incidental to construction of the Still Harbor Dock Facility on McNeil Island in southern Puget Sound, WA.

The Dock Facility is utilized by the Department of Corrections as a foul weather landing facility for the McNeil Island Corrections Center near Steilacoom, Washington. Significant deterioration of the existing dock facility, including the collapse in 1994 of the steel-pile-supported center portion of the facility, resulted in the need for major renovation in order to maintain a safe, functional facility. A previous incidental harassment authorization was issued in 1995 for the initial demolition of the damaged dock which posed an immediate risk. The renovation authorized in 1998 included demolition of the remainder of the damaged dock and construction of a new pier and dock facility. All new structures will be constructed within the footprint of the existing facility. The new dock will be significantly smaller than originally planned in 1994 (8,000 ft^2 v. 20,000 ft^2) (2400 - 6000 m^2). As construction may potentially result in disturbance of seals hauled out on nearby Gertrude Island, an authorization under the MMPA is warranted.

Harbor seals use nearby Gertrude Island as a low-tide haul-out and rookery. The maximum number of harbor seals using Gertrude Island during construction will vary from 200-600, depending upon the month. Because of the close vicinity of harbor seals *(Phoca vitulina)* to the construction, some seals may be disturbed and seek refuge in the water. To mitigate this effect, the Department of Corrections will not conduct in-water activities during the harbor seal pupping and nursing period, and will establish a 1,000-ft no-entry buffer zone around Gertrude Island to minimize the impact of vessel traffic on harbor seals during the project. Observations conducted under the 1995 authorization confirmed that some seals would be temporarily displaced by the noise and activities of construction, but that the number of seals using the haul-out at Gertrude Island would return to pre-disturbance levels following the completion of work. NMFS has determined that, with this mitigation, the taking will result in a negligible impact on a small number of harbor seals and therefore qualifies for an exemption under the MMPA.

Construction of the Northstar Oil Development Project in the U.S. Beaufort Sea

On August 14, 1998, NMFS received an application from BPXA requesting a one-year authorization for the harassment of small numbers of several species of marine mammals incidental to construction of the Northstar development in the Alaskan Beaufort Sea. NMFS accepted the application, noted its receipt in the *Federal Register* on October 26, 1998 (63 FR 57096), and requested public comment. The proposed construction activity during the period of the proposed incidental harassment authorization includes the construction of three ice roads, the construction of a gravel island work surface for drilling and oil production facilities, and two pipelines, one to transport crude oil and one for gas for field injection. Although construction was planned to extend into a second year, NMFS did not anticipate that a second harassment authorization would be necessary because in the interim, a five-year regulatory program would be established under section 101(a)(5)(A) of the MMPA (mentioned previously). However, as of the end of 1998, no action had been taken on issuing the first year incidental harassment authorization.

Acoustic Program

The need for NMFS action on acoustic matters was first recognized during the 1991 Heard Island Feasibility Test, when it was determined that the intense sounds could potentially harass marine mammals and was therefore subject to the provisions of the MMPA. Soon thereafter, the Office of Protected Resources began receiving increasing numbers of requests for authorizations for activities that produced noise. Two of the projects, the *John Paul Jones* ship shock trial and the ATOC (Acoustic Thermometry of Ocean Climate) project, were highly contentious. By 1995, NMFS saw a clear need for an agency acoustic team, and one was formed.

After 1995, increases in acoustic activities, especially in offshore petroleum exploration by the Minerals Management Service and various U.S. Navy projects, required more of NMFS than processing permit requests. Planning, coordination, review, and outreach were required. By 1998, it was no longer possible to manage acoustic problems on an ad hoc basis. The NMFS Office of Protected Resources added a person to the acoustics team to attend to programmatic matters and convened a workshop to gather information for new acoustic criteria to define "takes" from acoustic sources. A brief report of these two activities follows.

Acoustics Program Outline

A survey of the acoustics policy within NMFS showed that actions were potentially needed in the following areas:

* draft acoustic criteria to clearly define acoustic "takes" under the MMPA;

* educate NMFS personnel on basic acoustics and coordinate the use of acoustic criteria similarly in all regions;

* provide contact with other agencies, industry, professional societies, environmental NGOs, and news media on acoustic matters;

* outline research that is needed to improve guidelines or regulations on acoustics; and

* obtain additional funding for all programmatic aspects of the acoustics program, including research.

Elements of the NMFS acoustics program are being integrated into the small take program, scientific research permits, and other NMFS protected species programmatic responsibilities and functions. By the end of 1998, NMFS had taken action on most of these items. In addition, the team is involved in an international effort to standardize acoustic practices in offshore petroleum exploration activities.

Acoustic Criteria Workshop

Defining what types of sounds cause "takes" in marine mammals and endangered species is the single most pressing need in acoustics. Writing these definitions has been hampered by the fact that hearing ability has only been described for ten species of marine mammals and one species of marine turtle. Even less is known about the harmful effects of intense sound on these hearing structures, and still less is known about how sound affects the behavior of marine animals. Without such information, some of which is unpublished or in the "gray" literature, it is difficult to write appropriate acoustic criteria. To gather as much information as possible, the Office of Protected Resources convened a workshop of acoustic experts in September 1998 to ascertain the "best available" science in this field at that time.

A panel of ten acoustics experts met for two and one half days to answer specific questions posed to them by the NMFS acoustics team. The general public was invited to attend and to also address the panel. The discussions were taped for later production of a verbatim transcript, although no summary report was written or planned. The acoustic criteria are presently being drafted based on the workshop results and other information from the field of animal acoustics.

Chapter VII. Conservation and Recovery Programs

photo by: C. E. Bowlby, NMFS

The Marine Mammal Protection Act of 1972 (MMPA) authorizes NMFS to initiate and implement management actions, such as the development of conservation plans, for species or stocks whose survival is in jeopardy. The Endangered Species Act (ESA) confers similar management authority to NMFS for endangered and threatened marine species. This chapter summarizes species conservation and research activities undertaken by NMFS in 1998 pursuant to the MMPA and ESA.

Northern Right Whale (*Eubalaena glacialis*)

Valued for the quality and quantity of its baleen and oil, the northern right whale was the first of the great whales to be targeted by the whaling industry. By the late 1700s in the North Atlantic and by the late 1800s in the North Pacific, all right whale populations were "economically extinct". Today, they may be close to biological extinction throughout the Northern Hemisphere. Despite a ban on commercial harvest of right whales by the International Whaling Commission in 1949, and subsequent U.S. adoption of this ban, northern right whale populations have remained at precariously low levels. In addition, recently released data indicate that Soviet whalers continued harvesting North Pacific right whales until 1971. The species was listed as endangered under the ESA in 1973.

The western North Pacific right whale population is believed to number no more than a few hundred animals and its recovery status is unknown. It is clear the population in the eastern North Pacific is small, but there are no reliable estimates of population size, or trends in population size, and little information on distribution. Sightings over the past several decades have been rare, but increased search effort in recent years has resulted in new information on occurrence and distribution. In 1998, NMFS provided support for aircraft and ship-based surveys to help assess abundance, distribution, and stock identity of the eastern North Pacific population. A handful of sightings were made in the Bering Sea, and support for this work is expected to continue in 1999.

With regard to the eastern North Atlantic population, the near absence of right whale sightings over the last 40 years off the European continent suggests that the stock

once found in the eastern North Atlantic is probably functionally extinct.

The largest known northern right whale population, and the focus of greatest conservation efforts is the western North Atlantic population where there are about 300 individuals. In the western North Atlantic, right whales occur seasonally in at least three areas along the East Coast of the United States and two areas in Canada. The principal and only known calving area for the population is along the coast of northern Florida and Georgia. This area is used almost exclusively from December to March by females with newborn calves and some juveniles. The other four known seasonal habitats are feeding areas off New England and southeastern Canada. In spring, right whales regularly occur in Cape Cod Bay and the Great South Channel off Massachusetts. Recognizing the importance of these areas to the survival of this population, in 1994, NMFS designated these three areas as critical habitat.

Although no commercial hunting of right whales is known to have occurred in the western North Atlantic since at least the 1930s, other human activities are likely slowing recovery. Both collisions with ships and entanglement in fishing gear are documented causes of death and serious injury in the population. From 1970 to December 1998, there have been 46 known right whale deaths. Of these, 17 (37%) were from ship strikes, and two (4%) from fishing gear entanglement. For 14 deaths, the cause is unknown. Thirteen deaths were neonates (newborns). It is estimated that tens of non-fatal fishing gear entanglements have occurred since 1970.

Given these threats and the slow recovery rate of this population, NMFS has taken a number of steps to reduce adverse effects from human activities.

Recovery Plan Implementation

In 1991, NMFS published the Recovery Plan for the Northern Right Whale. The Recovery Plan identifies known and potential factors affecting the northern right whale in both the Atlantic and Pacific Oceans, and provides research and conservation recommendations aimed at reducing or eliminating adverse effects to the species. Among the objectives identified in the plan are: (a) identify and protect habitats essential to survival and recovery; (b) coordinate federal, state, international, and private efforts to implement recovery efforts; (c) identify and minimize any detrimental effects of directed air and watercraft interactions; (c) identify and/or eliminate sources of human-caused injury or mortality; (d) maximize efforts to free entangled whales and acquire scientific information from all specimens, dead or alive; and (e) monitor population size and trends in abundance.

With regard to the right whales in the North Pacific Ocean, the stated objectives are to: (a) initiate studies to determine the population size and monitor trends in abundance; (b) identify and protect habitats essential to survival and recovery; (c) collect and analyze information on the areas and seasons where potential conflicts exist between vessel traffic and right whales and the type of vessels involved; (d) enforce whale protection laws; (e) continue international bans on hunting and other directed lethal take; (e) reduce or eliminate injury and mortality caused by fisheries and fishing gear; and (f) maximize efforts to acquire scientific information from dead or stranded right whales.

New information has been gathered since release of the 1991 recovery plan, and a number of steps have been taken since then to protect right whales. Therefore, NMFS is currently updating the plan. The revised plan will review progress made since 1991, review new information gathered since that time, and identify new objectives and recommended recovery actions. Revised recovery actions will focus on attempts to reduce adverse effects from human activities, specifically, ship strikes and entanglement, and will address both the North Atlantic and North Pacific right whale stocks. The revised recovery plan is expected to be available by early 2000.

Establishment of Regional Recovery Plan Implementation Teams

The Endangered Species Act (ESA) provides authority to the Secretary of Commerce (*i.e.*, NMFS) to establish teams to assist in implementing recovery plans by reviewing recovery activities and providing recommendations to NMFS on improving such activities. Two such teams have been formed for right whales – one in the

southeastern United States and one in the northeastern United States.

The Southeastern U.S. Implementation Team (SEIT) was established in August 1993. It currently consists of representatives from the Georgia Department of Natural Resources; the Florida Department of Environmental Protection; NMFS Southeast Fisheries Center and Southeast Regional Office; U.S. Navy; Marine Mammal Commission; Georgia Ports Authority; Canaveral Port Authority; Glynn County Commission, Glynn County, GA; University of Georgia; U.S. Army Corps of Engineers; U.S. Environmental Protection Agency; Port of Fernandina, Fernandina, Florida; the U.S. Coast Guard (USCG), and the Jacksonville Port Authority.

The SEIT has met regularly since being established and, among other things, has worked to develop and implement a system of aircraft surveys to detect and report the locations of right whales to mariners (described below). Members of the SEIT have also implemented a local Notice to Mariners broadcast about right whale calving grounds which is broadcast four times daily by the USCG on VHF radio, and is carried by the Army Corp of Engineers as a part of its annually distributed tide charts. The SEIT also makes recommendations to NMFS and other agencies regarding right whale research and measures to reduce the possibility of ship strikes, and restrictions of hazardous fishing gear in right whale calving areas. Through the SEIT and NMFS annual support, the Right Whale Newsletter is published quarterly as a source of news, updates, and lists of recent publications for the right whale community.

Recovery Plan implementation for right whales and humpback whales *(Megaptera novaeangliae)* has been ongoing within NMFS Northeast Region since at least December 1990. These efforts were formalized with the establishment of the Northeastern Implementation Team (NEIT) in August 1994. The team meets regularly and consists of representatives from the USCG, the Environmental Protection Agency, NMFS, the Stellwagen Bank National Marine Sanctuary, the New England Fisheries Management Council, the Marine Mammal Commission, U.S Navy, Canada's Department of Fisheries and Oceans, Massachusetts Division of Marine Fisheries, the Massachusetts' Coastal Zone Management Office, and the Massachusetts' Port Authority.

The NEIT has worked to develop means to reduce human-related impacts to right whales. In 1998, and in previous years, the team has provided recommendations or guidance to NMFS and other agencies with regard to restricting hazardous fishing gear in right whale habitats, advising fishermen regarding disentangling whales caught in gear, plans for constructing a sewage outfall tunnel in Massachusetts Bay, and dredge disposal activities in Massachusetts Bay. The team and its participating agencies have also had important roles in the aircraft survey and communication system described below, as well as in the recovery of stranded or dead floating whales.

Efforts to Reduce Serious Injury from Fishing Gear Entanglements

Atlantic Large Whale Take Reduction Team and Plan

In August 1996, NMFS formed the Atlantic Large Whale Take Reduction Team to address the incidental take of humpback *(Megaptera novaeangliae)*, fin *(Balaenoptera physalus)*, minke *(Balaenoptera acutorostrata)* and northern right whales in the Gulf of Maine/U.S. mid-Atlantic lobster trap/pot fishery, the mid-Atlantic coastal gillnet fishery, the southeastern U.S. Atlantic shark gillnet fishery, and the Gulf of Maine sink-gillnet fishery. The Team prepared a plan, and although the Team failed to reach consensus on all measures, agreement was reached on a number of needed actions. The non-consensus plan was forwarded to NMFS in February 1997 (for more information, see Chapter II. Reducing Interactions Between Marine Mammals and Commercial Fisheries).

NMFS received and reviewed numerous public comments on the proposed rule and subsequently published an interim final rule in July 22, 1997 (62 FR 39157), with most requirements taking place January 1, 1998. In the meantime, NMFS implemented the Team's plan under the interim final rule. The provisions implemented were: (1) formation of a fishing gear advisory group; (2) research on potential fishing gear modification to determine ways to reduce entanglement and facilitate the release of entangled whales; (3) a fishermen outreach and education program; (4) expansion of the disentanglement network; (5) hiring a large whale coordinator in Maine

(a state in which much of the gear restrictions were opposed); (6) continuation and refinement of the northeast U.S. aircraft survey program; and (7) implementing some time/area closures and fishing gear restrictions. While these programs are in place and ongoing, NMFS is developing and expects to publish a final rule early in 1999. NMFS also expects to re-convene the Team in 1999.

Disentanglement Response Program and Network

As noted above and in previous MMPA Annual Reports, several right whales each year become entangled in commercial fishing gear. Depending on the situation and with consideration for human safety, all reasonable efforts are made to locate and free each entangled whale. Experience has shown that disentanglement is best undertaken by trained and experienced personnel, with appropriate protocols for the procedure as well as the associated data collection. NMFS has established a disentanglement program that involves: (a) a multi-agency and institution network to locate, monitor, and safely disentangle marine mammals; (b) maintenance of a database for entanglements, providing data access and periodic reports to users; and (c) development of regional protocols and plans, including outreach to the general public. The USCG provides critical support in monitoring initial entanglement reports and transporting disentanglement personnel to events.

The disentanglement program consists of one primary team and field station support in the northern Gulf of Maine/Bay of Fundy, central Maine, southern Gulf of Maine, and Georgia/Florida. Although the disentanglement team attempts to respond to all legitimate entanglement reports, priority is given for any immediately life-threatening event of endangered right and humpback whales.

In 1998, NMFS expanded the disentanglement network, particularly by increasing fishermen involvement. Commercial fishermen, in many ways, are ideal participants in the disentanglement network because of their vast experience on the water, knowledge of local fishing gear and practices, and familiarity with hazardous working conditions at sea. Fishermen are also likely to be operating vessels in areas where entanglements occur. In addition, the program has been expanded to include the mid-Atlantic states and the Southeast United States, and now includes the collection of equipment that can be quickly deployed to the site of an entangled whale.

NMFS also funded a contract with the Center for Coastal Studies in 1998 to develop a program for large whale disentanglement training for commercial fishermen in the state of Maine. Maine fishermen were chosen as the first group to have the opportunity to receive this training because of their experience with the state's expansive coastline (approximately 8000 km or 5000 mi), which includes numerous islands and is otherwise difficult for NMFS to monitor.

Through cooperation between NMFS, the Atlantic Large Whale Take Reduction Team, lobster zone council representatives, other fisherman, and Maine outreach contacts, a pool of interested fishermen has been identified. This program consists of four training levels, which will increase the fishermen's level of involvement with the disentanglement procedures as they progress. This program has been instituted, training began in spring 1998, and it will be ongoing in 1999. For more information, see Ch. X. Marine Mammal Health and Stranding Response Program.

Steps Taken to Reduce the Level of Ship Strike Deaths

In the last two years, NMFS has devoted considerable effort to educating the shipping industry and others about the vulnerability of right whales to ship strikes in an effort to reduce the probability of ship strikes. As noted earlier, impacts from human activities are likely slowing the recovery of this population, and death and injury from collisions with ships are likely a contributing factor.

Aircraft and Vessel Based Surveys for Western North Atlantic Right Whales

To help reduce the likelihood of ship strikes, a multi-agency team designed and conducts surveys that transect key northern right whale feeding and calving areas when

the animals are expected to be present. Surveys have been used in right whale habitat over waters off the Southeast United States since 1993, and since early 1997 in the Northeast United States. The primary objectives of these surveys are to: 1) locate right whales, 2) photograph right whales with high resolution photogrammatric cameras for the purpose of photo-identification and evaluating the extent to which the animals show evidence of vessel strikes.

In the Northeast United States, the primary source of information for the sighting network is dedicated aerial surveys conducted by NMFS and the state of Massachusetts in the two critical habitat areas and beyond. Surveys are done each year from January to the end of June. Additional sighting information sources which contribute throughout the calendar year are primarily opportunistic and include USCG aircraft and ships, ship-based sightings by several research organizations during their studies of right whales (Center for Coastal Studies, Woods Hole Oceanographic Institution, International Wildlife Coalition), research vessels operated by NMFS, the Northeast Region Stranding Network, whale watch vessels, and a high speed ferry. Sighting locations are processed, disseminated, and faxed by the NMFS Northeast Regional Office to a wide distribution network that includes federal and state agencies, shipping agents and pilots, and right whale researchers. Right whale locations are broadcast to ships and other maritime users for a 24-hour period via USCG Broadcast Notice to Mariners, NAVTEX, alerts on NOAA Weather Radio, and Army Corps of Engineers Traffic Controllers at Cape Cod Canal. Maps with right whale sightings are updated and posted on the Wheelock College WHALENET web site at:

whale.wheelock.edu/whalenet-stuff/reportsRW_NE/

Sightings information can also be found at the NMFS Northeast Region, Northeast Fisheries Center and the Massachusetts Executive Office of Environmental Affairs web sites. A NMFS Inquiry Line (telephone) also provides right whale sighting information and sends facsimiles of the sighting maps to interested callers.

Vessel based surveys were conducted in 1997 and are planned for 1999.

Working with Mariners

An important element of the system is raising the awareness of the mariners about the vulnerability of right whales to ship collisions. Among other things, shipping agents and pilots distributed the sighting reports to shipping captains and participated in the survey program coordination and planning meetings in 1998.

In the Southeast United States, the core group is the U.S. Navy, which disseminates the information through a coordinated system of faxes and pagers. The information is also made available through a number of real time media, including USCG Broadcast Notice to Mariners, NAVTEX (the USCG international communication system), and NOAA Weather Radio.

The aircraft survey program is a cooperative effort by NMFS, NOAA's Weather Service, USCG, U.S. Navy, U.S. Army Corps of Engineers, the Commonwealth of Massachusetts, the states of Georgia and Florida, Wheelock College, Massachusetts Environmental Trust, the Center for Coastal Studies, the New England Aquarium, NOAA's Stellwagen Bank National Marine Sanctuary, Massachusetts Port Authority, Naval Undersea Warfare Center Division, Newport, Rhode Island. In the southeast the program is jointly funded by NMFS, U.S. Army Corps of Engineers, USCG, and the U.S. Navy.

Updating Nautical Charts and Other Navigational Publications

Updating basic navigational publications was determined to be a logical first step in educating mariners about the vulnerability of right whales to ship strikes. To help ensure safe navigation in coastal waters of the United States, the National Ocean Service (NOS) periodically publishes and updates nautical charts. NOS also issues a series of regional books called Coast Pilots, basic references on regional environmental conditions as well as navigation hazards and rules. In U.S. waters, all ship's captains are required to carry the Coast Pilots. Since late 1997, NMFS,

NOS, and others have been working closely to update information printed on nautical charts and in Coast Pilots regarding right whale critical habitat and regulations about approaching right whales and other protected marine species. Schedules for updating these publications were made. As a result, Coast Pilot publications covering the entire eastern United States have been or will be updated to include information on the status of right whales, the times and areas in which they occur, the threats posed to whales by ships, as well as advice on measures mariners might take to avoid hitting right whales. As well, relevant nautical charts will be modified when they are printed. This effort to update and improve these navigational publications was lead by the International Fund for Animal Welfare, working through the Northeast and Southeast Implementation Teams for right whale recovery.

In early 1998, NMFS requested that the National Imagery and Mapping Agency's (NIMA) (formerly the Defense Mapping Agency) Notice to Mariners publication be modified to include information about right whales and provided language for inclusion in the publication. As a result, related language regarding the vulnerability of right whales to ship strikes and precautionary measures for avoiding ship strikes has been included in the NIMA's Notice to Mariners, which is updated and published annually.

NIMA annually publishes a related document, called Sailing Directions, which is prepared primarily for U.S. sailors heading for international waters. Working with counterparts in Canada, NMFS prepared information on right whales and precautionary measures for mariners for inclusion in Sailing Directions. In December 1998, NMFS wrote to NIMA requesting that the information be included in Sailing Directions. By early 1999, most of the primary navigational publications for the East Coasts of the United States and Canada will contain information on the seasonal occurrence and distribution of right whales, describe their vulnerability to ship strikes, and include precautionary measures mariners can take to reduce the chances of striking the animals.

Development of a Mandatory Ship Reporting System

In late 1997, the staff members of NOAA, NMFS, NOS, USCG, Marine Mammal Commission, and the International Fund for Animal Welfare began jointly developing a proposal for submission to the International Maritime Organization (IMO) requesting implementation of a mandatory ship reporting system in right whale habitats. The proposal requires all ships greater than 300 tons, entering essential right whale habitat to report location, speed, and destination to a shore-based station. In return, all reporting ships receive a message describing the status, distribution, and behavior of right whales. The return message will also indicate that mariners should not assume that whales will avoid oncoming vessels and that lookouts be alert for right whales, that mariners should listen for broadcasts reporting recent right whale sighting locations, and advise that reduced speeds be used when near whales or traveling in critical habitats or during conditions of poor visibility.

Incoming information about shipping traffic routes and patterns will be retained for analysis. Thus, the system would provide information on right whales directly to mariners as they entered right whale habitat and provide a means to obtain information on ship traffic volume and routes to assist in identifying measures to reduce future ship strikes.

The proposal to establish a ship reporting system was presented to the IMO's Subcommittee on Safety of Navigation in July 1998 in London, and subsequently transmitted to the overseeing Committee on Marine Safety. Following the Committee's review, the proposal received IMO approval in December 1998 and the system will be implemented by July 1999. Currently, NMFS and NOAA are working with the USCG and a contractor to design the satellite-linked communication system. NMFS and the USCG will share the cost of operating the system, and there will be no cost to the mariner. Design and implementation of the system was a multi-organization effort, involving government and non-government organizations.

While the ship reporting system may not eliminate ship strikes, NMFS believes it will reduce the likelihood of such events. The proposed reporting system will be relatively inexpensive to implement and will raise mariners' awareness of right whales in "real-time" as they enter areas where right whales are found. It also will provide much-needed information on the frequency and distribution of vessel transits through right whale habitat.

Further Efforts to Reduce Ship Strikes

The Safety of Life at Sea (SOLAS) Convention-driven International Safety Management Code requires vessel companies and owners to develop a procedure for safety of passengers and vessels at sea, which includes environmental protection measures and protocols. In 1998, NMFS worked with the USCG to ensure that the implementing regulations and protocol include information regarding vessel operation that is consistent with protective measures for right whales and other protected marine species. The USCG agreed with the NMFS recommendations and has incorporated this information into relevant regulations. Therefore, domestic vessels entering U.S. ports will be required to have vessel operation plans that include precautionary measures for right whales.

In addition, a number of agencies and organizations have collaborated on developing informational brochures and pamphlets on this subject, which are being distributed by the USCG and NMFS. Plans are being made for the 1999 production and distribution of a brief video for mariners, with partial support from NMFS, which will include information on the seasonal distribution of right whales. Also, NMFS's Office of Protected Resources has published several articles in shipping industry journals about the right whale/ship strikes issue.

Interagency Consultation Under the Endangered Species Act

Section 7 of the Endangered Species Act (ESA) mandates that federal agencies ensure that any action they authorize, fund, or carry out is:

"not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species."

Federal agencies comply with this requirement through an interagency consultation that involves NMFS, the U.S. Fish and Wildlife Service (FWS), or both, depending on the species affected by the action. Interagency consultations involve formalized procedures that are designed to identify the intended and unintended consequences of a federal agency's action; federal actions that are likely to adversely affect listed species or designated critical habitat undergo more rigorous evaluations that conclude with a "biological opinion." If the activity is likely to "jeopardize", then a "jeopardy" determination is issued. If not, then a "non-jeopardy" determination is made. A considerable amount of the recovery activities for all endangered and threatened species are implemented through consultations between NMFS and other federal agencies. As a result of these consultations, NMFS issues a biological opinion (BO) on the activity, which indicates whether or not the activity is likely to jeopardize the continued existence of the species throughout all or a portion of its range, and provides reasonable and prudent alternatives to the activity. The ESA also requires re-initiation of consultation if new information reveals that listed species or critical habitat may be affected in a manner, or to an extent, not previously considered.

In the last several years, NMFS has conducted consultations on the activities of a number of U.S. fisheries that have resulted in various types of time/area closures or other modifications of fishing operations and modification of vessel operating procedures to reduce the adverse effects of human activities on right whales and other protected species. Three such consultations were conducted or completed in 1998. They included: (1) a biological opinion issued in June 1998 on USCG ship and aircraft operations along the Atlantic coast after a cutter struck a humpback whale off New England; (2) an opinion issued in December 1998 on the American Lobster Fishery Management Plan; and (3) a December 1998 opinion on the Monkfish Fishery Management Plan. Each of these concluded with a non-jeopardy opinion.

NMFS-Supported Research Activities

In addition to supporting or implementing protective measures, NMFS supports various kinds of research to enhance existing knowledge of right whale populations and provide information to better shape management measures. In 1998, NMFS directly supported a number of projects, including those described below.

Photo-Identification and Aircraft Surveys

Photo-identification of individual whales, along with associated sight-resight models, has been identified as the best way to monitor trends in North Atlantic right whale abundance and demography. Long-term sighting and photo-identification databases are currently maintained, newly collected information is added cumulatively; and data products and analyses are provided to collaborating investigators. In 1998, NMFS supported a photo-identification study and supported maintenance of the database of right whale sightings. Ongoing analysis of these data and collection of new photos is central to a broad range of right whale science and management goals.

In addition, the NMFS-supported aerial survey program described above provided photo data to this research. The program and its partners collectively contributed a substantial number of the annual photo data gathered. For example, three right whales were identified for the first time in at least six years from data provided by the program and its partners; one right whale sighted by NMFS biologists in the Great South Channel had only previously been seen in 1992 off Iceland, representing the eastern- and northernmost sighting of this population. A total of 104 right whales were identified from the 1998 photo data. Most of the photo identifications in 1998 came from animals sighted in Cape Cod Bay and the Bay of Fundy. In addition, sightings from the Block Island Sound (primarily in shipping lanes) constitute the first documented use of that area by right whales in recent times.

As noted above, NMFS and other agencies support aircraft surveys for right whales, primarily to reduce the likelihood of ship strikes by identifying whale locations for ships. In addition, NMFS provided support in 1998 for aircraft surveys in the Southeast United States offshore of those being conducted over critical habitat by the states of Georgia and Florida. The suite of surveys being done in waters off the Northeast and Southeast United States also provide data on the occurrence and distribution of whales and allow the collection of photographs for identifying individual whales from year to year.

Disentanglement Program

As discussed above, each year several right whales become entangled in commercial fishing gear. For a number of years a disentanglement program has existed to make every reasonable effort to free whales caught in gear. As it has in the past, NMFS provided funding in 1998 for a contract to locate and attempt to free every right whale caught in gear. Generally, the program has been successful, and over the years, tens of whales have been freed.

Stranding and Human Impacts Response

Life history and human impact data were obtained from stranded and dead floating right whales through collaborative efforts in 1998 between NMFS, the USCG, the Center for Coastal Studies, the New England Aquarium, and others. Through NMFS support in 1998, the on-site presence of experienced researchers was assured, as well as the maximization of data collection following standardized protocols and the submission of reports, which include the cause of injury or death.

Workshop on Predicting Right Whale Distribution

Reduction of adverse effects from human activities may be enhanced if right whale occurrence in specific areas and residency times can be understood and predicted. A workshop was held in Woods Hole, Massachusetts on October 1-2, 1998 to evaluate the possibility of predicting right whale distribution from environmental data, and to do this with sufficient reliability to be of use in improving research and management of the species. A report of the NMFS-supported workshop, including recommendations for follow-up actions and research, will be completed in January 1999.

Research on Fishing Gear Modifications to Reduce Entanglement Rates

As noted above in the section on the Atlantic Large Whale Take Reduction Plan, NMFS supported research on fishing gear modification. The work was aimed at identifying and assessing possible changes in the way fishing gear is made or deployed to reduce the likelihood of entanglement and to improve the chances that an entangled whale could free itself. Work begun in 1997, was continued in 1998, and will be ongoing in 1999. A number of possible modifications have been identified and are being tested; and field trials are expected in 1999. The progress of this work will be the subject of a report to Congress entitled "Research on Fishing Gear Modifications to Reduce Entanglement of Large Whales," to be completed early in 1999.

Genetic Analysis

Genetic analyses have been underway since 1988 to determine or clarify information on taxonomy, matrilines, genealogies, and habitat-use patterns of right whales. These analyses, including those supported in 1998, are helping to provide insights into stock definition and genetic variability within a stock. The goals of this research are to: assess the population's genetic variability, identify the number of reproductive animals and their reproductive status, identify social units and individual association patterns in each habitat area, better understand mating relationships, and identify matrilines, the degree of inbreeding, population viability, and other factors essential to management. Recent scientific investigations have compared the genetic variability of northern and southern right whales, and found the former to be significantly less diverse.

Steller Sea Lion (*Eumetopias jubatus*)

Steller sea lion distribution extends along the North Pacific Ocean rim from the Kuril Islands and Okhotsk Sea and south along the North American coast to California, with centers of abundance and distribution in the Gulf of Alaska and Aleutian Islands. Since the 1970s, the Steller sea lion has declined by 80% or more throughout much of its range in the Gulf of Alaska (GOA) and Bering Sea/Aleutian Islands Region (BSAI).

As a result of the decline, the entire species was listed as threatened under the Endangered Species Act (ESA) in 1990. The most recent counts suggest that within the central part of this range (from the Kenai Peninsula to Kiska Island in the western Aleutian Islands), abundance declined by 27% from 1990 to 1998. Between 1994 and 1998, counts of non-pup sea lions at rookeries and haulouts of the western population declined by 13%; counts of pups at trend sites declined by almost 20% in the same interval. In 1997, the species was split into two management populations, and the western population was reclassified as endangered.

Multiple factors are believed to have contributed to the overall decline since the 1970s. The major impacts to the decrease of the population have resulted from incidental catches (prior to the mid-1980s) and from a reduction in carrying capacity, which may have resulted from basic environmental changes and/or competition for prey with fisheries producing a reduction in available prey. Other factors such as commercial harvests, disease, subsistence harvests, shooting, and disturbance, have been determined as producing minor effects to the Steller sea lion population. Steller sea lion researchers and resource managers alike continue their efforts today to delineate causes for the decline and to determine effective management tools for their recovery. Current progress toward these goals is discussed below.

Recovery Team Efforts

The Steller Sea Lion Recovery Team published two workshop reports that reviewed the Steller Sea Lion Recovery Program and developed future research priorities, including the study of behavior patterns at haulout sites and rookeries and the use of telemetry.

Research Activities in 1998

NMFS, the Alaska Department of Fish and Game (ADFG), the North Pacific Universities Marine Mammal Research Consortium, and others developed a cooperative research program to monitor population trends and elucidate the cause or causes of the Steller sea lion decline.

In October 1998, Congress appropriated fiscal year 1999 funding to the National Fish and Wildlife Foundation (NFWF) for Steller sea lion research at the Alaska SeaLife Center (ASLC) in Seward. This project is one in a series of projects awarded in 1998 through a cooperative process established by NOAA and NFWF in 1993. In carrying out this directive, NFWF, in cooperation with NOAA and the ASLC, are in the process of identifying priority needs for ASLC conservation efforts regarding Steller sea lions.

Since the listing of the Steller sea lion in 1990, NMFS and the ADFG have conducted subadult/adult and pup surveys to assess the Steller sea lion populations. Results of these population assessment surveys are published routinely as part of the NOAA Technical Memorandum series on Steller sea lion abundance estimates. Each year, results of aerial and land-based surveys are presented to the North Pacific Fisheries Management Council.

Population Assessments

NMFS and the ADFG conducted aerial and land-based surveys of Steller sea lions in Alaska during June and July 1997 and 1998. During a limited-range survey in 1997, NMFS and the ADFG counted a total of 16,249 non-pup Steller sea lions on 127 rookery and haul-out sites in the central and western Gulf of Alaska and eastern Aleutian Islands. In 1998, a total of 39,597 non-pups were counted on 236 rookery and haul-out sites Alaska-wide. Of these, 20,976 were on 33 trend rookeries. The results suggest a decline of 7.0% since 1996. From 1990 to 1998, the estimated average annual decline for the trend rookeries was 3.5%.

The western stock of Steller sea lions in Alaska includes animals from the eastern Gulf of Alaska through the western Aleutian Islands. At 30 western-stock trend rookeries, NMFS counted 14,368 non-pups in 1998, which indicated declines of 12.2% from 1996 and 35.0% from 1990. The estimated average annual rate of decline from 1990 to 1998 was 5.4%. Complete western-stock counts were not available for all rookery and haul-out trend sites because a number of sites were not surveyed in the eastern Gulf of Alaska in 1998. Counts for rookery and haul-out trend sites in the central Gulf of Alaska through the western Aleutian Islands suggested western-stock declines of 9.3% from 1996 and 26.6% from 1991, or an estimated average annual decline of 4.3% over the seven-year period.

In the Kenai Peninsula to Kiska Island index area, a subarea within the Alaska portion of the western stock, we counted 24,318 non-pup sea lions at 203 surveyed sites. Of these, 16,315 were at 69 trend sites (26 rookeries and 43 haulouts), and 11,994 were at 26 trend rookeries. The 1998 count for the 69 trend sites down from 8.9% from 1996 and 28.3% from 1990. The estimated annual rates of decline were 4-5% for trend sites and trend rookeries (1990 to 1996) and 2% for all surveyed sites (1991 to 1996).

The eastern stock is represented in Alaska only by Southeast Alaska, where NMFS and the ADFG counted 8,693 non-pups at eleven trend sites (rookeries and haulouts). This indicated an increase of 5.6% from 1996, a decline of 1.5% from 1994, and an increase of 14.0% from 1990. The estimated average annual rate of increase from 1990 to 1998 for trend sites in Southeast Alaska was 1.8%. Overall changes were similar for the three trend rookeries in Southeast Alaska, as was the estimated annual increase of 2.0% from 1990 to 1998.

The ADFG and NMFS counted 6,932 live pups at 12 rookeries in Alaska in 1997 and 13,607 pups at 40 rookeries Alaska-wide in 1998. The 1998 count included all rookeries in Alaska except Walrus Island in the Pribilof Islands. Pup numbers in the eastern stock (Southeast Alaska) increased by 12.3% from 1994 to 1998, and generally increased by about 2% per year since 1990. The western stock in Alaska (excluding the western Aleutian Islands) declined by 19.0% from 1994 to 1998. In the western Aleutian Islands, pup numbers declined 18% from 1997 to 1998, the only years for which comprehensive comparison is possible.

Considering non-pup and pup counts together, the western-stock region showing the most positive trend during recent years was the central Aleutian Islands. The worst observed declines were in the western Aleutian Islands: 13-16% overall for non-pups from 1996 to 1998 and 18% for pups from 1997 to 1998. More information is

available in a NMFS Technical Memorandum, entitled "Aerial and Land-Based Surveys of Steller Sea Lions (*Eumetopias jubatus*) in Alaska, June and July 1997 and 1998."

Foraging Studies

Scat Collection. As part of NMFS, the National Marine Mammal Laboratory (NMML) and the Alaska Fisheries Science Center continued winter foraging studies, and collected fecal materials (n=671) at 26 rookeries in the Gulf of Alaska and Aleutian Islands from June 24 through July 5, 1998, in conjunction with the pup count survey. Food habits results from scat collection are presented as they become available. These samples are being processed at the NMML in Seattle, Washington.

Physiological, Genetic, Survival, and Behavioral Studies

During June and July 1998, a total of 384 pups were handled and flipper tagged at seven rookeries in the Aleutian Islands and two rookeries in the Gulf of Alaska: Attu (27), Agattu (Cape Sabak: 49), Buldir (25), Kiska (Lief Cove: 50), Ulak (49), Seguam (34), and Ugamak (50), Chowiet (50), and Marmot (50). Mass, standard length, axillary girth, and flipper width were obtained from each of these pups. Blood and genetic samples were taken from 50 of these 384 pups in the Aleutian Islands. Genetic samples (but not blood) were taken from an additional nine of these 384 pups. This work was part of NMFS' ongoing evaluation of the physical condition of Steller sea lions and NMFS' investigation of possible causes of the Steller sea lion's Alaskan population decline.

The 50 pups tagged at Marmot Island, included in the 384 tagged pups, above, also were given a bleach mark on their pelage so that they could be identified from the cliff-top observation points. This was part of a "mark-recapture" experiment for comparison of several pup counting methods.

1998 Steller Sea Lion Prey Surveys

Scientists from the NMML and the U.S. Fish and Wildlife Service (FWS) conducted hydroacoustic surveys for Steller sea lion prey at three sites in Alaskan waters aboard the FWS vessel *MV Tiglax* during March 4-25, 1998. The principal objectives of this cruise were: 1) to conduct hydroacoustic-midwater trawl surveys in the waters surrounding sea lion rookeries at Buldir, Kasatochi, and Ugamak islands for comparison with results from similar surveys conducted at the same sites during July 1997 and 2) to collect sea lion scat samples (fecal material) at rookery and haul-outs sites in the region for food-habits analysis. Scientists from NMML and the University of Alaska Fairbanks (UAF) conducted hydroacoustic surveys of sea lion prey during a cruise in the Aleutian Islands from June 18 to July 13, 1998 aboard the *MV Tiglax*, in conjunction with the pup-count survey. Principal objectives during this portion of the cruise were to conduct hydroacoustic, midwater-trawl, bottom-trawl surveys of prey resources in the waters surrounding the Cape Sabak rookery on Agattu island in the western Aleutian Islands and the Ugamak island rookery and the Cape Sarichef (Unimak Island) haulout in Unimak Pass. Secondary objectives included: 1) collection of sea lion scats (fecal material) for food-habits analysis from all visited sites and 2) sighting surveys of marine mammals and seabirds during hydroacoustic surveys.

ESA Section 7 Consultations on Fishery Management Actions

On February 26, 1998, NMFS concluded that the 1996 Biological Opinion (BO) on the groundfish fishery remained valid for 1998.

On March 2, 1998, NMFS issued a BO that evaluated the effects of the GOA Fishery Management Plan (FMP) and the 1998 pollock total allowable catch (TAC) specifications on the Steller sea lion. NMFS concluded that the 1998 Gulf of Alaska fishery was not likely to jeopardize the continued existence and recovery of Steller sea lions or to adversely modify critical habitat. NMFS noted that the BO only addressed the 1998 fishery, not the continued implementation of the GOA FMP beyond 1998, and that the NMFS Alaska Region would need to reinitiate Section 7 consultation for the fishery in 1999 and beyond.

This opinion authorized the same incidental take level that was authorized in the 1996 opinion (15 Steller sea lions for the GOA). The authorization would be re-evaluated when additional data become available on the number of sea lions injured or killed annually by gear associated with this fishery. No reasonable or prudent alternatives to these management measures were identified. NMFS was required to monitor the level of incidental take that occurs as a result of the 1998 GOA fishery and complete a report by March 15, 1999.

NMFS included the following conservation recommendations in this BO: (1) initiate studies of the efficacy of buffer zones as soon as possible; (2) continue studies to determine the foraging range of young-of-the-year Steller sea lions; (3) continue to educate the fishing community about Steller sea lions and techniques to reduce or eliminate incidental take of the species; and (4) conduct studies of the site-by-site relation between fishing effort and trends in juvenile survival or counts at nearby rookeries.

On March 17, 1998, NMFS issued regulations for amendments 36/39 to the Bering Sea and Aleutian Islands (BSAI) and GOA FMPs (63 FR 13009). This action created a forage fish species category in FMPs and implemented associated management measures. Directed fishing for forage fish would be prohibited at all times in the Federal waters of the BSAI and GOA. The intended effect of this action was to prevent the development of a directed commercial fishery for forage fish. The proposed rule (62 FR 65402) stated that: a) forage fish are important prey for marine mammals, seabirds, and commercially important groundfish species, and b) decreases in the abundance of these predators may be related to declines in forage fish.

On June 11, 1998, NMFS issued a final rule to change the seasonal apportionment of the pollock TAC in the Western Central Regulatory Areas of the GOA by moving 10% of the TAC from the 3rd fishing season (starting September 1) to the 2nd fishing season (starting June 1) (63 FR 31939). This seasonal shift of TAC was a precautionary measure intended to reduce the potential impacts of pollock fishing on Steller sea lions by reducing the percentage of the pollock TAC that is available to the fishery during the fall and winter months.

In June 1998, the North Pacific Fishery Management Council (NPFMC) recommended a regulatory amendment to the Secretary of Commerce that would impose an A/B season apportionment (50:50) of Atka mackerel TAC in each of the three management areas, and would incrementally shift the fishery catch until a target split of 40% inside critical habitat and 60% outside critical habitat was reached in 2002. Consequently, the proposed action includes the conservation measures recommended by the NPFMC to avoid potential competition between the Atka mackerel fishery and the Steller sea lion. Those measures reduce potential localized mackerel depletions by temporally dispersing the fishery into two seasons, and spatially dispersing the fishery among areas inside and outside of critical habitat. The subsequent division of the TAC among seasons and sites should reduce considerably the potential for localized depletion of prey resources at any particular point in time or space. The incremental approach to reductions of TAC in Steller sea lion critical habitat is reasonable since it allows some time for detection of unanticipated adverse effects that might result from redistribution of the fishery. As proposed, the conservation measures will be fully implemented by 2002. If these conservation measures are fully implemented, the proposed action should not appreciably reduce the likelihood of both the survival and recovery of the Steller sea lion.

On October 21, 1998, the President signed into law the American Fisheries Act, which changed the allocation scheme for pollock in the BSAI beginning in 1999 (46 U.S.C. 2101, PL 105-277).

On December 3, 1998, NMFS issued a BO on three fisheries proposed for 1999-2002: 1) authorization of an Atka mackerel fishery from 1999 to 2002 under the Groundfish Management Plan of the BSAI area; 2) authorization of a pollock fishery from 1999 to 2002 under the Groundfish FMP of the BSAI; and 3) authorization of a walleye pollock fishery from 1999 to 2002 under the Groundfish Management Plan of the Gulf of Alaska.

The BO concluded that the Atka mackerel fishery was not likely to jeopardize the endangered western population of Steller sea lions or destroy or adversely modify its

designated critical habitat, but the pollock fisheries of the Gulf of Alaska and BSAI, as proposed for 1999-2002, were likely to jeopardize the western stock of Steller sea lions and destroy or adversely modify its critical habitat. The opinion analyzed the effects of these actions on the endangered western population of Steller sea lions and its critical habitat.

The BO did not prescribe a single set of Reasonable and Prudent Alternatives (RPAs), but rather established a framework to avoid the likelihood of management actions and FMPs jeopardizing the continued existence and recovery of Steller sea lions. This framework included guidelines for management measures to achieve three principles: 1) protection of waters adjacent to rookeries and haulouts; 2) temporal dispersion of the pollock fisheries; and 3) spatial dispersion of the fisheries. The intended combined effect of these three principles was to modify the fisheries to avoid jeopardy and adverse modification.

On December 13, 1998, the NPFMC recommended management measures for the two pollock fisheries to comply, in part, with the framework established in NMFS' December 3, 1998, opinion. On December 16,1998, NMFS adopted the measures recommended by the NPFMC (with modifications) into the BO as part of a RPA for the fisheries.

Litigation on Alaska Groundfish Fisheries

On April 15, 1998, a lawsuit was filed by Greenpeace, American Oceans Campaign, and Sierra Club alleging NMFS violations of ESA and the National Environmental Policy Act (NEPA) in managing Alaska groundfish fisheries. Specifically: (1) ESA biological opinions considering effects of fisheries on Stellers are arbitrary and capricious; (2) NMFS violated NEPA by: (a) failing to supplement Environmental Impact Statements despite major changes in fisheries and environmental baseline, (b) commencing 1998 fisheries without analyzing environmental impacts of fisheries, and (c) concluding that 1998 fisheries would not have a significant impact. Several fishing industry groups and Alaskan coastal communities joined as intervenor-defendants. No relief was sought for operation of the 1998 fisheries, but the plaintiffs indicated that litigation of their claims would be relevant for the January 1999 pollock fishery.

On October 9, 1998, litigation was stayed until December 16, 1998 when NMFS was required to produce an ESA BO evaluating the effects of the pollock and Atka mackerel trawl fisheries on Steller sea lion recovery and their critical habitat.

On December 18, 1998, the Court held a status conference. The judge gave until the end of 1998 for parties to request immediate injunction. Since no one made such a request, the judge set a new schedule.

Harbor Porpoise *(Phocoena phocoena)*

Harbor porpoises are among the smallest and shortest-lived marine mammals, seldom living more than ten years. The Gulf of Maine population of harbor porpoise includes all harbor porpoise found in the waters of eastern North America from (and including) the Bay of Fundy, Nova Scotia, and south to eastern Florida. The southern-most stock is the Gulf of Maine/Bay of Fundy stock, though in the winter, part of this stock moves south into the Mid-Atlantic. This stock (commonly called the Gulf of Maine stock) is believed to be composed of approximately 50,000 animals (with a Potential Biological Removal level of 483).

Harbor porpoises spend their time in coastal waters where they prey on small schooling fish, including some fish that are sought by gillnet fishers. Because of this, harbor porpoises sometimes become entangled in gillnets and drown. NMFS estimates that New England and Mid-Atlantic gillnet fisheries take approximately 2,000 harbor porpoises per year (1800 in the Gulf of Maine and 200 in the Mid-Atlantic).

Gulf of Maine Harbor Porpoise Listing Determination

This population was first proposed for listing under the ESA (with a 90-day comment period) on January 7, 1993 (58 FR 3108). This population includes all harbor porpoise found in the waters of eastern North America from (and including) the Bay of Fundy, Nova Scotia, and south to eastern Florida. At the time of the proposal, the listing was considered necessary based on NMFS analyses that the rate of bycatch of porpoise in commercial gillnet

fisheries (extending from the Bay of Fundy, Canada, south throughout the Gulf of Maine range of this population/species) may reduce this population/species to the point where it becomes threatened throughout all or a portion of its range and that there were no regulatory measures in place to reduce this bycatch.

In response to public comments on the proposed rule, NMFS extended the comment period until August 7, 1993, (58 FR 17569) and completed analyses of sighting data from the 1992 porpoise abundance surveys and analyses of the 1992 observer data used to determine total estimated bycatch in the Gulf of Maine gillnet fishery. These data were presented and discussed at a meeting of the New England Fishery Management Council (NEFMC) Groundfish Committee, Porpoise Subgroup, on June 16,1993.

The NEFMC believed that the data cast doubt on whether the Gulf of Maine harbor porpoise population was distinct, and, thus, a species under the ESA. Under ESA section 4, if there is substantial disagreement regarding the sufficiency or accuracy of the available data relevant to the determination or revision concerned, NMFS may extend the one-year period of determination. In accordance with this provision, the date for the final determination on the proposal was extended for six months on November 8, 1993 (58 FR 59230) to allow for a further review of the bycatch trend, to allow for analysis of the 1993 bycatch data prior to final determination, and to allow for further consideration of all data, including the abundance survey data, relevant to the final determination. NMFS reopened the comment period following completion of these analyses (59 FR 36158). In the meantime, NMFS issued a final rule instituting time and area closures in the Framework Adjustment 4 to the Multispecies Fishery Management Plan for sink gillnet gear (59 FR 26972).

The New England Harbor Porpoise Working Group (HPWG) met on July 21, 1994, to discuss the corrected bycatch data and recommended that the revised bycatch estimates should be more fully explained so that public review and comment could provide more meaningful input to NMFS prior to the final determination. NMFS prepared a document in August 1994 that addressed HPWG concerns and extended the comment period again until September 11, 1994 (59 FR 41270).

In March 1995, NMFS held an informal meeting with staff from the Center for Marine Conservation, International Wildlife Coalition, and Sierra Club Legal Defense Fund regarding the status of the harbor porpoise listing. Given that additional data would be available later in 1995 and that the listing decision must be based on the best available scientific information, it was understood that the listing determination would be put on hold while NMFS reevaluated the factors that prompted the proposal and looked into the development of a take reduction team/plan that would provide adequate protective measures and eliminate the need for a listing.

Taking into account the implementation of a bycatch reduction measures in the Gulf of Maine by the NEFMC, the Harbor Porpoise Take Reduction Plan (HPTRP) in the Gulf of Maine and Mid-Atlantic waters (see Ch. II. Reducing Interactions Between Marine Mammals and Commercial Fisheries) is expected to be published as final in the fall of 1999 pursuant to section 118 of the MMPA. A similar harbor porpoise bycatch mitigation program is being implemented by the Department of Fisheries and Oceans-Canada (DFO-Canada). NMFS expects to issue a final determination not to list the Gulf of Maine/Bay of Fundy (GOM/BOF) population of harbor porpoise as threatened under the Endangered Species Act (ESA) in January 1999.

Additionally, Federal legislative and regulatory actions are now in place in the United States and Canada to protect the GOM/BOF harbor porpoise. NMFS expects that the recently implemented HPTRP will provide the measures and mechanisms necessary to achieve reduction of harbor porpoise bycatch to acceptable levels, thereby warranting the decision not to list harbor porpoise as threatened under the ESA.

NMFS will continue to monitor bycatch levels and adjust the bycatch reduction programs as necessary to promote reduced bycatch. NMFS intends to reconvene the take reduction teams semiannually during the first year of plan implementation in order to track the HPTRP's progress toward the six-month MMPA goal. Measures

within the HPTRP are expected to prevent more than 1,600 of the nearly 2,000 annual harbor porpoise deaths currently caused by gillnet fishing in these areas. This would reduce harbor porpoise entanglement to approximately 300 animals per year in the Gulf of Maine and fewer than 50 deaths in the Mid-Atlantic.

This listing determination was recently the subject of litigation with the Center for Marine Conservation, the Humane Society, and the International Wildlife Coalition. As part of the settlement agreement, NMFS agreed to make a final listing determination by January 4, 1999. In the event that NMFS determined not to list harbor porpoise under the ESA, NMFS also agreed to complete a 90-day review of the biological status of the GOM/BOF harbor porpoise population on or before March 31, 2000, and consider the need to publish a proposal to list the population based on the review at that time.

Northern Fur Seal *(Callorhinus ursinus)*

In the Pribilof Islands, northern fur seals have been killed for their pelts since 1786. In fact, the kill became an enterprise of the U.S. Government when it purchased Alaska, and was so lucrative that it alone repaid the purchase price of Alaska in five years. International competition for pelts culminated in the International North Pacific Fur Seal Treaty of 1911 that involved Japan, Imperial Russia, Great Britain (for Canada), and the United States. All research and management of fur seals was conducted under the auspices of the North Pacific Fur Seal Commission from 1911 to 1985, except during World War II.

In the 1950s, managers noted that the number of pups being born annually was the same as in the herd's most productive period (1932-37), but that far fewer juvenile males were available to kill for pelts. They surmised that density-dependent mortality was increasing juvenile mortality, and that this situation could be reversed by reducing the number of pups being born annually, thereby reducing competition for food that was believed to be causing the reduced survival. Consequently, managers killed 331,000 females from 1956-63 in what was called the herd reduction program. Managers expected the herd to recover from this reduction at 8% per year. Nine years after herd reduction ended, the expected recovery had not yet begun, and the herd continued to decline, ironically, at 8% per year.

Believing that it did not fully understand the relationship between survival and abundance, or the effects of human activities on seal behavior and ecology, the U.S. Government proposed that all fur seal rookeries on St. George Island be set aside as a research preserve for 15 years to permit comparisons with rookeries at St. Paul Island (40 km or 25 mi away) where the kill for pelts was to continue. Investigations were to include behavior, ecology, population dynamics, and pelagic studies. The behavioral project was to investigate whether behavioral changes had occurred as a result of artificial selection, human disturbance, or density-dependent processes on breeding areas, as well as to investigate the effects of fur seals on the fishery for walleye pollock. These studies began in the summer of 1974. The St. George Island project officially ended in 1985 when the United States failed to approve continuation of the Fur Seal Treaty of 1911. However, field work in behavior continued until 1992 when data analysis began.

Research Efforts

Based on the 1997 population estimate as well as known immigration of recruitment-age females, mortality, and possible emigration of adults associated with the El Niño Southern Oscillation event, the St. Miguel Island stock of northern fur seal is thought to be approximately 12,704 individuals. Objectives of NMML northern fur seal research in 1998 included monitoring population status and trends on the Pribilof Islands and San Miguel Island, investigating patterns of survival and movement of pups at San Miguel Island, and investigating foraging ecology and movement patterns at sea during the summer breeding season on St. Paul Island. Population monitoring activities, such as adult male counts, pup censuses, pup mortality and pup condition indices provide vital rates with which northern fur seal population status and trends are monitored. Survival rates and female fur seal recruitment on San Miguel Island, estimated using tag re-sight data, allow for interpretation of how environmental and biological events impact population growth. Female foraging studies and scat analysis pro-

vide information on food habits, foraging habitats, and travel routes, which aid in understanding foraging ecology and movement patterns at sea.

Researchers are currently analyzing this data. Preliminary results of some population monitoring activities for 1998 are briefly discussed here. When completed, these results will be available as a collection of research papers in the annual NOAA Fur Seal Investigations Technical Memorandum Series.

Censuses of adult male fur seals were conducted on San Miguel Island and on the Pribilof Islands during 1998. On St. Paul Island, 4,762 territorial males with females, and 8,396 idle adult males were counted in 1998, representing decreases of 6.0% and 1.9%, respectively, from 1997. On St. George Island, 1,116 territorial males with females, and 1,084 idle adult males were counted in 1998, representing an increase of 22.6% and a decrease of 26.5%, respectively, from 1997. The total number of adult males on the Pribilof Islands decreased by 4.1% from 1997 to 1998. Between 1986 and 1993 the numbers of harem and idle male fur seals on the Pribilof Islands increased; since 1993 the number of territorial males with females on the Pribilof Islands decreased by 21.9%, the number of idle adult males decreased by 11.6%, and the total number of adult males decreased by 15.6%. On San Miguel Island, the first territorial males arrived about two weeks later than usual and the maximum number of territorial northern fur seal bulls in Adams Cove declined 55% from 1997.

Pup censuses were conducted on the Pribilof Islands and San Miguel Island in 1998. The number of pups born on St. George Island in 1998 was 22,090 (SE=222), including 452 dead pups. This estimate represents a significant decrease in the number of pups born on St. George from 1996. The number of pups born on St. Paul Island in 1998 was 179,149 (SE=6,193), including 5,058 dead pups. This estimate is not significantly different from the estimate made in 1996.

The number of pups born on San Miguel Island in 1998 was 628, a decline of 80% from 1997. The mean pupping date was almost three weeks later than any other year for which we have records. In addition to low pup production on San Miguel, observed pup mortality rates were the highest on record, 52% by the end of August. The low pup production and high pup mortality were the result of the 1997-98 El Niño conditions along the California Coast. Although the El Niño conditions were slowly waning during the 1998 breeding season, the high pup mortality of northern fur seals indicates that the prey of fur seals at San Miguel Island was less abundant or more dispersed throughout the summer due to the residual pools of warm water along the California Coast. As a result, females had difficulty finding enough food to rear their young. In 1998, the high count of females ashore was 293, down from 847 in 1997; indicating that many females did not return to the breeding island in 1998. The persistence of poor foraging conditions since 1997 has resulted in high pup mortality in two consecutive years for the San Miguel Island fur seal population.

Northen fur seal pup mortality studies were conducted on St. Paul Island during 1998, and emaciation was observed as the primary cause of death of 93 pups necropsied.

Condition Indices of Pups on St. Paul and St. George Islands

Pup measurements conducted during 1998 on the Pribilof Islands found significant differences in size between males and females, and between islands. Male pups weighed more and were longer than female pups. Weights were greater on St. George Island than on St. Paul Island for male pups ($P=0.006$) and for female pups ($P=0.088$). Lengths were greater on St. Paul Island than on St. George Island for both male pups ($P<0.001$) and female pups ($P<0.001$). The proportion of females observed during pup measurements was significantly different than 50% for both islands in 1998. The proportion of females was 46.0% ($P=0.004$) on St. Paul Island and 46.2% ($P=0.02$) on St. George Island.

Entanglements on St. Paul and St. George Islands

Entangled northern fur seals were opportunistically captured, and debris was removed during the course of other research projects. On St. George Island, 19 individual

seals were disentangled, including: 11 males, seven females and one seal of undetermined sex. On St. Paul Island, 22 fur seals were disentangled during other operations, including 15 males and seven females.

Activities Planned for 1999

Research activities planned for 1999 on the Pribilof Islands include adult male counts, pup mortality studies, and pup condition indices for the continuing population monitoring activities. Blood will be collected from pups during the condition index studies. Foraging studies will be conducted on juvenile males to provide information on the food habits, foraging habitat and travel routes of this component of the population. These data will be useful for comparing the foraging ecology of juvenile male and adult female fur seals, and will provide a more complete picture of the utilization of the Bering Sea, and its resources, by fur seals from the Pribilof Islands during the summer breeding season. Blood will be collected from these juvenile males and diet will be determined using enemas or scats, if possible. Additionally, female scat collections will be made during other research projects.

Research activities planned for 1999 on San Miguel Island include continuation of the population monitoring studies (adult counts, pup censuses, pup mortality, pup condition indices) and pup survival studies (pup tagging and tag reading surveys). A comparative study of summer foraging behavior between northern fur seal and California sea lion females is also planned.

Hawaiian Monk Seal *(Monachus schauinslandi)*

The Hawaiian monk seal is endemic to the Hawaiian Archipelago and is the only endangered marine mammal species located entirely within U.S. waters. The species was listed as endangered after a 50% decline in beach counts occurred between the late 1950s to the 1970s. Studies conducted over the past decade indicate that population abundance has continued to decline at 4-5% per year. In the last three to five years, beach counts have stabilized, but further overall declines are likely due to high juvenile mortality and an expected decline in recruitment. In 1997, total abundance was estimated at about 1300-1400 seals.

Studies of the Hawaiian monk seal are conducted primarily by members of the Marine Mammal Research Program of the NMFS Honolulu Laboratory. The studies' purposes are to provide up-to-date information on the status and trends of each of the six main reproductive subpopulations of seals. Information is collected annually on abundance, composition, survival and reproductive rates, growth and condition of seals, evidence of disease, behavior, movement between sites, fisheries interactions (including entanglement in marine debris), foraging ecology, and the effectiveness of management programs aimed at facilitating recovery.

Recovery Team Activities

The Hawaiian Monk Seal Recovery Team (HMSRT) held its annual meeting at NMFS Honolulu Laboratory on December 1-3, 1998. During the HMSRT meeting, the Marine Mammal Research/Monk Seal Program staff presented a review of their field studies. These studies (discussed in greater detail below) provide information necessary to evaluate key objectives that have been identified by the HMSRT:

1) the status and trends of monk seal populations;
2) survival, reproduction, growth, behavior, and feeding habits; and
3) the results of various activities designed to facilitate population growth and reduce human disturbance.

Species Status: Results of the 1998 Field Season

In 1998, field studies were conducted at French Frigate Shoals, Laysan and Lisianski Islands, Pearl and Hermes Reef, and Midway and Kure Atolls. Three of the most common indices of species' status as derived from these studies are described below based on data from five of the six main reproductive sites. Midway Atoll is excluded from the analyses because past research effort at that site has been sporadic. The first index is the number of pups born. In 1998, 235 births were recorded, which is above the mean of 183 for the period from 1983 to 1995 (excluding 1994, when studies were incomplete). Since 1983, the number of pups born has been highly variable (ranging from 141 to 224), with no clear evidence of a long-term trend.

The second index is a sum of the mean beach counts, excluding pups. In 1958, this sum was 969. By 1985, the counts had declined to 509, and in 1998, the sum was 375. Since 1993, the sum of the counts has been essentially unchanged. For the past decade; however, the trend in the beach counts has been determined largely by the decline in counts at French Frigate Shoals. Beach counts are expected to decline further at French Frigate Shoals because of high juvenile mortality and the attrition of older animals who are not being replaced by recruitment from younger age classes. Thus, the future trend for the species will depend on whether growth at other sites can compensate for the decline at this site.

The third index of the status of the Hawaiian monk seal is the composition of beach counts. Since the mid-1980s, composition has shifted considerably, with the percent of adults rising from about 50% to 70%, and the percent of subadults and juveniles decreasing in a corresponding manner. This shift portends a decline in reproductive recruitment in the near future.

Island-by-Island Description

The observed trends in pups born, beach counts, and composition of beach counts are best explained by studies of individual subpopulations. A brief summary of the six main reproductive subpopulations is provided below.

French Frigate Shoals (FFS). In the late 1950s, the subpopulation of seals at FFS was depleted, due largely to human disturbance. After disturbance was eliminated, the subpopulation grew for three decades and by the mid-1980s, abundance was thought to have reached or begun to approach the environmental carrying capacity. Because subpopulations at the other main reproductive sites plummeted during the same period, the overall distribution of monk seals shifted toward FFS, and nearly 50% of the entire species was found at this site in the mid-1980s.

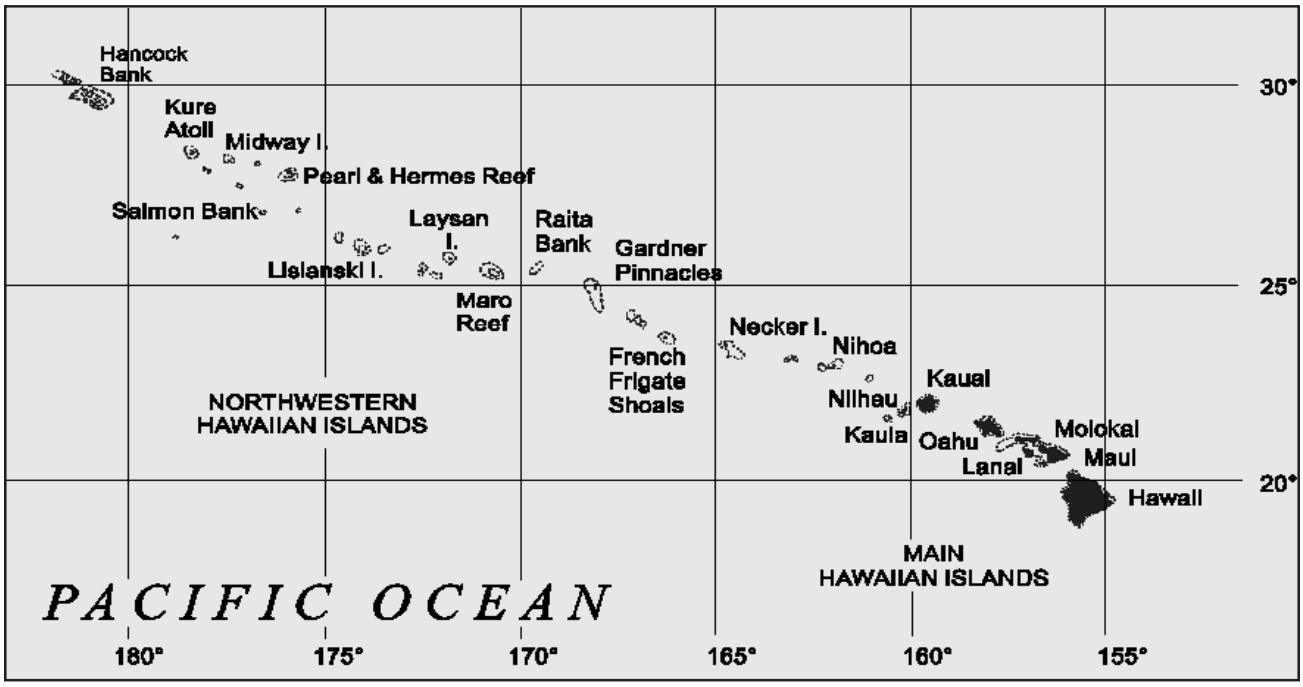
In 1989, the period of growth reversed itself and by 1998, beach counts had dropped by 55%. The primary cause of the problem appears to be related to a decrease in prey availability, which has led to a severe drop in juvenile survival.

During the past four years, survival of unweaned and newly weaned pups decreased dramatically. In 1997, researchers documented two factors contributing to increased mortality; adult male aggression and shark predation. A primary research goal for 1998 was to investigate and mitigate the loss of young pups.

In 1998, the mean beach count (including pups) was 167 at FFS. The trend in minimum number of pups born has fluctuated around a mean of 100 with an increasing trend from 1995 to 1998. Trends in mean beach counts of juveniles and sub-adults have declined since the mid 1980s, whereas the mean beach count of adult seals has declined in the 1990s. The resultant age structure of the population is composed mostly of seals older than ten years of age. Survival rates from birth to weaning were less than 85% in 1991 and from 1995-1997. During both of these periods adult male seals were known to kill pups. In 1998, early pup survival again rose above 85%. Cohort-specific survival rates of all cohorts from 1984 to 1998 have been generally above 80% for seals born before 1988. However, the 1984 and 1985 cohorts experienced an unusual decline from 1995 to 1996. Cohort survival rates for seals born after 1988 have been lower than for earlier cohorts. For example, first year survival for the 1997 cohort was only 14%. In 1998, the sex ratio at FFS for most size classes was female biased and ranged from 0.5:1 to 0.8:1 (M:F); pups represented the only exception (1.2:1).

Adult male aggression and shark attacks were causes of early pup mortality in 1997. On June 8, 1998, the problem of male aggression was alleviated by the translocation from FFS to Johnston Atoll of two adult males known to have killed pups. Subsequently, no pups were found drowned or injured by adult males during the 1998 field season at FFS.

At Trig Island, fourteen of 61 pups born were injured by sharks. Also, the disappearance of six pups before weaning seemed to be linked to shark predation because of a weakening of the mother/pup bond. Typically, pups that were injured or disappeared were not commonly seen in close association with their mothers prior to weaning or they had been prematurely weaned.



Vulnerability of pups to male aggression and shark predation may be related to changes in the number of pups born at various locations within FFS. The destruction of Whale-skate Island due to winter storms and the possibility of disturbance at East Island associated with turtle nesting has likely forced parturient seals to use less preferred sites (*e.g.*, Trig, Gin or Little Gin Islands).

Laysan Island (LAY). In 1998, the mean beach count (including pups) of 118 seals at LAY was about 30% of the historical maximum of 320 animals in 1958. Mean beach counts excluding pups, monitored since 1983, have increased slightly in recent years. The 1998 non-pup population total was 239 animals (an increase of 13 from 1997). The overall sex ratio of the total population was 1:1. The average number of births for the past 22 years was 35; 46 pups were born in 1998. Survival of pups from birth to weaning was above 90% in 1998, and only one pup died at or near weaning in 1998. During the past seven years, the number of births have been above the long term average, yet the survival rate for these younger animals has been lower. Survival to one year for the last three years was 68%. While survival of seals to age one to three years has decreased since the early 1980s, survival of older animals was typically high. In addition to lower survival rates of immature seals, the growth in body size of the seals has also decreased. In recent years there has been a marked drop in the number of five year-old seals achieving adult size. There were four seal deaths at LAY in 1998: one weaned pup died from an infection resulting from a minor wound inflicted by a conspecific, one weaned pup drowned while entangled in a net caught on an offshore reef, one pup died at or near weaning from an injury of unknown cause, and a two year-old male died as a result of mobbing. Eleven of 17 seals oiled in 1993 are still sighted at LAY: one was last seen in 1993, four in 1994, and one in 1995. The first recorded movement of a seal from Midway (a six year-old female born there) immigrating to LAY occurred in 1998. Previously, the farthest recorded travel between LAY and the western end of the chain was Pearl and Hermes Reef.

Lisianski Island (LIS). The mean beach count in 1998 at LIS was 72 seals (including pups), representing about 33% of the historical maximum counted in the late 1950s. Beach counts declined dramatically in the 1960s, and then stabilized, with a possible continued slow decline in recent years. Twenty-five pups were born in 1998, and the number of pups born annually has not changed significantly since the early 1980s. The size composition of the counts remained stable for the adult and pup size classes, but juvenile and subadult numbers have declined

slowly over time. In 1998, the total spring-summer population was 187 seals. The population age structure was constricted, with a lack of immature seals due to recent poor juvenile survival. Survival to one year was 53% for weaned pups tagged in 1997; much lower than survival in the 1980s, but higher than yearling survival in the previous two years (41% each year). The sex ratio was approximately 1.0:1 (23 males: 22 females) for immature seals other than pups and 1.6:1 (72 males: 45 females) for adults. Within the adult age class, the sex ratio for older (>16 years of age) and unknown aged adults was strongly skewed toward males at about 2.7:1 (38 males: 14 females), whereas the ratio for younger adults (16 years of age) was ca. 1.1:1 (34 males: 31 females). Thus, the sex ratio is expected to continue to decline as a result of natural morality in the older age classes.

Survival from birth to weaning was high (91%). However, evidence of adult male aggression towards older pups and adult females was apparent. Three incidents of adult male aggression were observed. Two adult females were observed being mounted by two and three adult males; both escaped serious injury. In the third incident, at least three adult males were observed fighting at the water's edge. When they dispersed, a freshly killed weaned female pup was observed floating in the water with fresh scratches typical of male mounting. In a separate incident, a dead weaned female pup was found floating in the water with wounds commonly associated with male mounting behavior. In addition, two female pups disappeared (one 34 days post birth and the other 21 days post weaning). In 1998, there were four confirmed deaths of female pups (one nursing and three weaned) and two probable pup deaths (a nursing pup of unknown sex and a prematurely weaned male). Four entanglements were observed involving three seals: an adult female and weaned female pup escaped independently and one adult female was released by observers twice from the same debris. At least 43 pup exchanges occurred between eight nursing females.

Factors Influencing Population Trends at LAY and Lisianski (LIS) Islands

Little growth has been observed in both the LAY and LIS sub-populations. Recently, concern had been expressed about the poor survival rates of juveniles at these sites. Survival rates to one year in 1998 for LAY and LIS were 68 and 53%, respectively. Three factors are known to affected the survival of seals at both of these sites. Mobbing, which is related to the adult sex ratio of a population, entanglements, and shark attacks have been implicated in deaths at both sites.

The sex ratio of adult males to adult females at LAY has declined from 2.1:1 in 1983 to 0.9:1 in 1998. This decline was reinforced by the removal of 37 adult males: nine (one additional died during capture) were translocated to Johnston Atoll in 1984, five were brought into captivity in 1987, and 21 (one additional male died during capture) were translocated to the Main Hawaiian Islands in 1994. Within the adult size class, the sex ratio for older (>15 years of age) and unknown-aged adult males was 1:1, whereas the sex ratio for younger adults (<15 years of age) was 0.8:1. Without management intervention, the adult male to adult female sex ratio at LIS has also declined from 2.5:1 in 1982 to a current ratio of 1.6:1. The sex ratio for older (>16 years of age) and unknown aged adults was strongly skewed toward males at 2.7:1, whereas the ratio for younger adults (<16 years of age) was 1.1:1.

Although there were two mobbing injuries in 1998, the severity of mobbing injuries has declined on LAY since 1992. Since the removal of adult males in 1994, only two mobbing related deaths and disappearances have been observed; the disappearance of an immature female in 1995 and the death of a two year-old male in 1998. The research effort at LIS has been intermittent over the years, but has had consistent coverage during the last four years. In 1998 on LIS, there were three mobbing related events, one of those resulting in the death of a weaned pup. There were also two unusual disappearances of pups shortly before or after weaning at LIS. Mobbing injuries and observations of mobbing incidents have been documented here for nearly 20 years, however, the problem is of questionable significance to population growth.

Entanglement in marine debris represents another significant threat to monk seal survival at LAY and LIS. In 1998, four entanglements were recorded each at these sites; one of these seals died at LAY (mentioned above).

From 1982-98, there were 49 total entanglements reported on LIS and 42 entanglements on LAY. The relative number of entanglements at LIS was even more pronounced when the entanglement rate was corrected for field observation effort.

Severe injuries from shark attacks represents another potential severe impact on seal survival. Since 1982, only three deaths at LAY and five at LIS have been attributed to shark inflicted injuries, thus suggesting a relatively low level impact on these populations. Interestingly, the peaks in number of shark injuries coincided with the years of peak number of mobbing injuries. Adult male seals received nearly half of all the severe shark inflicted injuries at LAY. From a limited number of observed mobbing events, tiger sharks were seen circling under the group of seals during the mobbings and an adult male was attacked by a shark while mounting another seal.

The effects of pup switching on survival should be explored further, particularly at LIS. In 1998, LAY had 46 births and five exchanges, compared to 25 births and 43 exchanges at LIS.

Pearl and Hermes Reef (PHR). The 1998 mean beach count at PHR was 93 (including pups). While beach counts increased 7% per year during 1983-93, they have remained unchanged during 1995-98, which may be an indication that the population is nearing its carrying capacity. There were 32 documented births and 29 weaned pups were tagged in 1998. One pup was nursing at the end of the field period, one disappeared a few days prior to weaning, and one was found dead at the beginning of the field period. This was the highest number of births ever recorded at PHR and includes the birth of a pup by a rehabilitated FFS female from Kure Atoll. The total population of seals was 251 individuals. The overall sex ratio was 0.9:1 and the sex ratio of the 1998 cohort was 0.4:1. Survival from birth to weaning continues to remain above 90%. Survival of the older cohorts was high, generally over 90% . Currently, juvenile survival is lower than the 1980s, but remains higher than all sites except Midway Island. First year survival of the 1997 cohort was 72%.

Midway Atoll (MID). In 1998, NMFS conducted research throughout the year in collaboration with Hawai'i Wildlife Fund researchers. The mean beach count (including pups) was 24 at MID, representing less than half the historical maximum counted in the late 1950s. Counts declined dramatically in the 1960s and remained very low in the 1970s and 1980s, but have recently increased. Births have also increased, from zero to two pups born annually from the early 1980s through 1993 to a peak of eleven pups born in 1997 and 1998. The size composition of the counts showed dramatic increases in the adult and pup size classes, but no increases in subadults and juveniles until 1998, when the number of juveniles increased. In 1998, the total spring-summer population was 56 seals. The population has relatively few immature seals due to low pup production and poor juvenile survival in earlier years. However, yearling survival has increased for the past three years, and all known age seals that have survived to age two were alive in 1998. The sex ratio was strongly skewed towards females at ca. 0.5:1 for immature seals (non-pups) and 0.2:1 for adults. Nine females in the MID population originate from the past rehabilitation efforts for weaned pups or juveniles (eight from FFS and one from KUR) released at either MID (2) or KUR (7); four of these females produced pups at MID in 1998. Inter-atoll movement was documented for 22 seals that made a total of 33 movements between MID and either PHR or KUR.

Survival from birth to weaning was high (91%) in 1998. One confirmed death (a perinatal pup with multiple congenital anomalies) and one probable death (a subadult female severely injured by sharks) were reported. This subadult was sampled and noted in poor condition during the health assessment project 12 days prior to injury. Four entanglements were documented: three male weaned pups were released by observers, and one adult male freed itself. In addition, a juvenile female found by FWS personnel in January hauled up on an alternate runway was moved to the nearest beach. This seal has not been resighted since. Two aborted fetuses were found in October and December.

Kure Atoll (KUR). In 1998, the mean beach count (including pups) at KUR was 54 animals, representing a continued gradual increase since the mid 1980s. The

increase includes a high number of pups born (23) in 1998, while the non-pup beach count of 41 seals has slightly decreased since 1997. The total population was 122 seals, including 73 adults, 26 subadult/juveniles, and 23 pups. The number of subadult/juvenile seals in the population continued a decline first evident in 1994. The age structure of the KUR seal population reflects that lower survival of pups in recent years has resulted in a slight paucity of one and two year old animals. Overall sex ratio is approximately equal, although the number of pups born in 1998 showed a highly imbalanced ratio of 2.8:1, males to females. Survival from birth to weaning is high; however, because of the abbreviated field duration, perinatal deaths among females parturient early in the field season cannot be documented.

Role of Health and Disease in Population Trends

Several natural sources of mortality have been identified or suggested for wild Hawaiian monk seals (*e.g.*, ciguatera poisoning, starvation, shark predation, disease, and trauma/mobbing), but the relative significance of these factors and their effect on population trends are unknown. The purpose of this project is to assess the role of health and disease in population trends of the Hawaiian monk seal. The potential for disease transmission has been an important concern in management activities involving translocation of seals between reproductive sites. For example, it is not known if disease influenced the extensive loss of seals translocated to Midway in 1992-93. Further, the eye ailment of the pups brought into captivity for rehabilitation also exemplifies the importance of assessing disease in the monk seal population. Disease processes that cause low levels of mortality, or result in episodic die-offs may also represent important determinants of long-term population trends. For example, the mass mortality of monk seals that occurred at Laysan Island in 1978 may have been due to a disease. Similarly, disease may be contributing to the high juvenile mortality occurring at French Frigate Shoals since 1998.

To enhance the recovery of the Hawaiian monk seal, a better understanding of the health and disease status of the wild population is required. A severe disease outbreak could be catastrophic for this endangered species. Findings thus far do not contraindicate translocation as a strategy to enhance population recovery, however more information on the health of the different subpopulations is needed to evaluate the risk of disease transmission during such translocation activities. It is difficult to evaluate that risk when the understanding of disease processes in this species remains limited.

Pup Survival at French Frigate Shoals (Enhancement)

Since 1981, captive care and release programs have been an integral part of management efforts to enhance the recovery of the Hawaiian monk seal. Three strategies have been used, including:

1) on-site protection and release, 2) direct translocation from one site to another, and 3) transport to Oahu for rehabilitation, followed by release into the wild population. Initial captive care and release efforts were intended to enhance the depleted subpopulation at Kure Atoll. These efforts were successful, and this subpopulation appears to be in the process of recovery. Since the late 1980s, juvenile survival at French Frigate Shoals (FFS) has been extremely low. Consequently, recent captive care and release efforts have focused on salvaging the reproductive potential by rehabilitating female pups from FFS and releasing them at sites where their survival rate would be higher.

The appearance of an eye ailment of unknown etiology among seals brought to Honolulu for rehabilitation in 1995 (see below), resulted in a hiatus of the monk seal captive care and release program, and provided the impetus for a review of program activities by a panel of independent wildlife experts. One of the primary recommendations from the panel was to resume efforts to enhance population recovery at selected reproductive sites through direct translocation of weaned female pups.

The preliminary results from health and disease screening at FFS, Midway Atoll, and Pearl and Hermes Reef do not preclude translocation of weaned pups from French Frigate Shoals to Midway Atoll (see above). Additionally, the Hawaiian monk seal Recovery Team has recommended exploration of an *in situ* care and release project at FFS, akin to the headstart program previously employed at Kure Atoll.

The objectives of the Translocation/Survival Enhancement research in FY99 are:

1) characterize the timing, pattern and causes of mortality in weaned Hawaiian monk seal pups at FFS in order to design effective strategies for mitigation of mortality through translocation, *in situ* care and release, or other management activities. Methods employed include VHF telemetry, health screening, and periodic assessment of condition during the first six- to eight-months post-weaning;.

2) compile and computerize all accumulated records from past Hawaiian monk seal captive care, maintenance and release programs (these data will be summarized and analyzed for development of a Hawaiian Monk Seal Response, Care and Release Plan); and

3) provide logistical support to researchers tracking large sharks with sonic transmitters.

Foraging Ecology

The Hawaiian monk seal recovery project has a comprehensive research plan to investigate foraging ecology. This plan has four distinct but complementary parts: 1) foraging habitat use; 2) prey selection; 3) assessment of prey availability/abundance; and 4) assessment of carrying capacity. This research into fundamental aspects of monk seal ecology is critical for assessment of potential fisheries interactions, adequacy of critical habitat and other protective measures, causes of high juvenile mortality, and for designing effective management strategies. Because this project has not received direct funding, it has only been partially implemented.

A complete assessment of the foraging ecology of the Hawaiian monk seal will take extensive effort over many years. Nevertheless, important progress was made in 1996, 1997 and 1998, through satellite-linked studies of distribution and diving, video camera studies of foraging strategies, and assessment of reef productivity around the main reproductive sites. No work has been done on the foraging energetics of monk seals; however, plans are being made to expand pelagic ecology studies of juveniles, whose survival rates have decreased dramatically at French Frigate Shoals over the last decade and because of an apparent depletion of prey resources.

Deployments of "crittercams" on male monk seals have indicated that foraging occurs primarily in the benthic/demersal habitat at approximately 60 m (198 ft). Seals ignored fish communities in the water column associated with coral reefs and focused on cryptic fauna in transition zones where consolidated substrate, rubble, and debris border areas of sand. Independent video assessments indicate that this types of habitat represents a small percentage of the overall demersal habitat. Future "crittercam" work will focus on documenting nocturnal foraging with the aid of a red-shifted light source. This method of observing animal behavior has helped to better characterize nocturnal foraging habitat and was used in the 1998 field season at French Frigate Shoals.

Relocation of Ten Female Seals

Throughout 1998, NMFS Southwest Region worked to identify potential holding facilities for the permanent maintenance of ten captive female Hawaiian monk seals that have been determined to be unreleasable due to the unknown eye disease. These ten seals were originally part of the project to salvage the reproductive potential of weaned female pups at French Frigate Shoals.

Fifty-one female pups have been rehabilitated and released into the wild subpopulations since 1981. Such efforts bolstered population growth at the Kure Atoll, and similar plans have been developed for the enhancement and recovery of the Midway population. The unexpected eye affliction of ten female seals brought to Honolulu for rehabilitation in 1995 eliminated the possibility of their release. A panel of independent wildlife experts, the Monk Seal Captive Care Review Panel, recommended that the ten seals must not be released into the wild population and that efforts must continue to determine the infectious agent, if possible, and establish protocols for dealing with future outbreaks. They also recommended that NMFS attempt to relocate the seals at an appropriate domestic facility as soon as possible. Personnel at the Honolulu Laboratory conducted an exhaustive search of potential domestic facilities and subsequently have made arrangements to transfer the seals to Sea World in San Antonio, Texas in the spring of 1999, where the seals will continue to be involved in research and public education programs regarding this highly endangered species.

These captive seals have much potential value for future research on virology, behavior, genetics, and captive breeding of the species. It is believed that permanent captivity and relocation of the seals at an appropriate facility is the optimum choice for their long-term care. In the context of the Endangered Species Act, based on NMFS responsibility to implement the Recovery Plan and in accordance with the Captive Care Review Panel recommendations, relocation of these ten seals is critical. Federal funds currently being used for the care and maintenance of these ten animals drains funds that would otherwise be used in conservation and recovery activities focused on the remaining wild subpopulations.

Marine Debris and Entanglement

In late 1996 and 1997, NMFS initiated a feasibility study to monitor nearshore reefs within the seals' habitat. This study was conducted in cooperation with the National Ocean Service (NOS), which provided platform and diver support from the NOAA ship *Townsend Cromwell.* The results from surveys conducted at FFS and PHR, where approximately 50% of the total Hawaiian monk seal population resides, indicate that there are roughly 38,000 net fragments on the coral reefs at these locations. A subsequent, pilot, multi-agency survey and removal effort in 1998 was conducted in cooperation with the NOS and the U.S. Coast Guard (USCG), which provided platform and diver support from the NOAA ship *Townsend Cromwell* and the USCG ship *Kukui*, respectively. This successful effort surveyed 2.4 km^2 (1.44 mi^2) and recovered seven tons of derelict net and line from FFS. Because all entangled monk seals are not captured and freed from their debris, disentanglement alone is an inadequate treatment of the problem. By removing debris from key habitat, fewer seals will suffer entanglement.

The NMFS Honolulu Laboratory is committed to taking the lead in this multi-agency cleanup effort. Cleanup activities in FY2000 will include another multi-agency effort to remove, monitor, and identify the source of marine debris in the near shore coral reef habitat at Lisianski Island and Peal and Hermes Reef, Hawaii. Both sites have been identified as areas experiencing a high rate of monk seal entanglement.

Chapter VIII. Native Take of Marine Mammals

photo by: Kimberlee Beckmen, University of Fairbanks Alaska

Section 101(b) of the Marine Mammal Protection Act of 1972 (MMPA) provides an exemption from the provisions of the MMPA for Alaskan Indians, Aleuts, or Eskimos for the takings for subsistence purposes or for purposes of creating and selling authentic native articles of handicrafts and clothing. These takes, however, may be limited by quota and other regulations if the species involved is determined to be depleted under the MMPA. Two subsistence species, the bowhead whale *(Balaena mysticetus)* in the Beaufort and Chukchi Seas, and the northern fur seal *(Callorhinus ursinus)* on the Pribilof Islands, are subject to such limitations. The remaining subsistence take is undergoing harvest level monitoring.

Co-management Agreement with Alaska Natives

In 1994, section 119 was added to the MMPA to clarify that the Secretary of Commerce (NMFS) has the authority to:

"enter into cooperative agreements with Alaska Native organizations to conserve marine mammals and provide co-management of subsistence use by Alaska Natives."

Under section 119, NMFS may provide grants to Alaskan Native organizations to facilitate the:

1) collection and analysis of marine mammal data;
2) participation of the organization in marine mammal research projects;
3) monitoring of Alaskan Native harvests of marine mammals; and
4) development of co-management regimes with federal agencies.

In April 1996, the Indigenous People's Council for Marine Mammals (IPCMM) expressed to NMFS and U.S. Fish and Wildlife Service (FWS) its concern about the need to develop a framework for governing the development of cooperative agreements for individual species of marine mammals. It provided a draft agreement for consideration and, after several workshops and drafting sessions, an official Memorandum of Agreement (MOA) was signed by NMFS, FWS, the U.S. Geological Survey, and IPCMM on August 27, 1997. This umbrella agreement was designed to assist in the development and implementation of section 119 agreements and promote the sustained health of marine mammal populations utilized

for subsistence. The MOA recommends that section 119 agreements consider:

- collection and analysis of marine mammal natural history and population data
- development of co-management infrastructures
- cooperation in enforcement efforts
- establishment of harvest levels
- development and distribution of public education materials
- development of management plans
- incorporation of traditional knowledge into management decision making
- training

Species Harvested for Subsistence

Bowhead Whales

NMFS works cooperatively with the Alaska Eskimo Whaling Commission to monitor the bowhead whale *(Balaena mysticetus)* subsistence harvest. Catch limits for the subsistence take of bowhead whales are approved by the International Whaling Commission (IWC). At the 1997 IWC Annual Meeting, a five-year subsistence take quota, which will be shared with the Russian Chukotka Natives, was established. For the years 1998-2002, the total number of bowhead whales landed shall not exceed 280. For each of these years, the number of bowhead whales struck shall not exceed 67, except that any unused portion of a strike quota from any year (including 15 strikes from the 1995-1997 quota) shall be carried forward and added to the strike quotas of any subsequent year, provided that no more than 15 strikes shall be added to the strike quota for any one year. The quota was established by the IWC based on a joint proposal by the United States and the Russian Federation. In 1998, the subsistence harvest of bowhead whales by Alaskan Eskimos reached 54 strikes, resulting in 41 whales landed. This hunt had one of the highest efficiency rates (struck vs. landed) ever observed.

Table 1. Bowhead Whale Takes by Alaska Natives

year	*harvested*	*struck/lost*	*total*
1992	38	12	50
1993	41	11	52
1994	34	12	46
1995	42	14	56
1996	38	5	43
1997	48	18	66
1998	41	13	54

Gray Whales

At its 1997 meeting, the International Whaling Commission approved, by consensus, a five-year block quota of 620 gray whales *(Eschrichtius robutus)*, with an annual cap of 140 animals. The quota was a joint proposal by the United States and the Russian Federation and was based on an aboriginal subsistence harvest of an average of four gray whales a year for the Makah Indian Tribe combined with an average of 120 gray whales for the Russian natives of the Chukotka region.

The Makah request is unique in that the Tribe's 1855 Treaty of Neah Bay is the only Indian treaty in the United States that expressly reserves a Tribal right to go whaling. As of December 31, 1998, the Makah did not actually hunt.

Northern Fur Seals

The subsistence harvest of northern fur seals *(Callorhinus ursinus)* on the Pribilof Islands, Alaska, is governed by regulations published under the authority of the Fur Seal Act and the MMPA. Pursuant to these regulations, NMFS publishes a summary, every three years, of the fur seal harvest for the previous three-year period and a projection of the number of seals expected to be taken in the subsequent three-year period to meet the subsistence needs of the Aleut residents on the Pribilof Islands.

Based on the results of the 1994-1996 harvests and due to responses from the tribal governments on St. Paul and St. George Islands, NMFS published a notice establish-

Table 2. Northern Fur Seal Harvests for 1997-1998

Year	*#*	*Location*	*Subtotal*
1997	227	St. George Island	
	1,153	St. Paul Island	1,380
1998	256	St. George Island	
	1,297	St. Paul Island	1,553

ing the annual harvest ranges on the Pribilof Islands.

As a step toward achieving the maximum utilization of seals harvested for subsistence purposes, the tribal government of St. Paul voluntarily eliminated the "butterfly cut" as a standard method of field dressing harvested seals, and resolved to take only whole animals off the field. The only exceptions to the removal of whole carcasses from the field, as permitted by the tribal government, are:

a) those animals taken to accommodate some of the elder residents who are physically unable to butcher whole animals supplied to them by the tribal government and;

b) those carcasses in which the gall bladder was inadvertently ruptured, thus contaminating some of the meat with bile. This practice began with the 1995 harvest, and during 1998 only one butterfly cut seal was taken from the field under these exceptions. The butterfly cut was never a standard field dressing method on St. George Island; therefore, removing only whole carcasses from the harvesting field is now a uniform practice in the Pribilofs.

In cooperation with the tribal governments of St. Paul and St. George Islands and the Pribilof Islands Stewardship Program, NMFS continues to make significant progress toward "full utilization" of the animals taken in the subsistence harvest through the development and reestablishment of traditional art and handicraft skills. Among the most notable uses of the inedible portions of the animals taken are the traditional processing of pelts, throats, teeth, bone and other parts for barter, art and handicraft purposes. The increase in traditional use of these materials has substantially reduced the level of harvest byproducts previously discarded. NMFS will continue to monitor the entire harvest on St. Paul Island and a portion of the harvest on St. George Island during the 1999 season.

Harbor Seals

The Alaska Native Harbor Seal Commission (ANHSC), formed in May 1995, is a tribal consortium comprised of native communities within the habitat range of the harbor seal off the coast of Alaska. The goal of the ANHSC is to strengthen and increase the role of Alaska Natives in resource policy and decisions affecting harbor seals and their uses.

In early 1998, the NMFS Alaska Regional Office entered into negotiations with the ANHSC on an agreement, under section 119 of the MMPA, for the conservation and co-management of harbor seals in Alaska. The primary purpose of the co-management agreement on harbor seals is to set forth an operational structure for the conservation and management of harbor seals in Alaska between the ANHSC and NMFS. The agreement outlines a consensus-based operational structure, or co-management committee, comprised of three representatives from NMFS and three representatives from the ANHSC. This committee will be responsible for implementing the co-management agreement.

The goals of the co-management agreement are to:

1) develop an Annual Action Plan for the conservation of Alaska harbor seal populations and the co-management of subsistence uses of harbor seals in Alaska. The Annual Action Plan will address population monitoring, harvest management, education, and other recommendations;

2) promote the sustained health of harbor seals in order to protect the culture and way of life of Alaska Natives who rely on the harvest of harbor seals for subsistence uses;

3) promote scientific research and the collection of data, including the traditional knowledge of Alaska Natives, in order to facilitate management decisions concerning harbor seals in Alaska;

4) identify and resolve, as early as possible, through a consultative process, any management conflicts that may arise associated with Alaska harbor seals; and

5) provide information to subsistence hunters and the public at large, as a means of increasing the understanding of the sustainable use, management and conservation of harbor seals.

In December 1998, NMFS and the ANHSC were in the final stages of negotiation for this agreement. Following finalization of this co-management agreement, NMFS and the ANHSC will proceed to develop and implement the Annual Action Plan specified by the agreement.

Steller Sea Lions

An interim Alaska Native Steller Sea Lion Commission was formed in 1994. The Commission was to consist of representatives from Alaska communities that take Steller sea lions *(Eumetopias jubatus)* for subsistence needs and was formed to improve communication among these indigenous communities, to advocate for conservation of Steller sea lions, to advocate for protection of customary and traditional rights of indigenous peoples with regard to access and use of sea lions, and to serve as the focal point for development of cooperative agreements with NMFS. No substantial progress was made during 1995-96 in establishing a functioning Commission, or in the adoption of hunting guidelines originally proposed by Native hunters.

In May 1997, the Aleutian/Pribilof Islands Association and the Alaska Department of Fish and Game (ADF&G), through partial funding from NMFS, sponsored a meeting in Dutch Harbor to address the need for a permanent and effective Alaska statewide Steller Sea Lion Commission. Those in attendance agreed on the need for such a Commission and discussed how it might relate to a regional marine mammal commission, considering that the highest level of subsistence take of Steller sea lions occurs in the Aleutian and Pribilof Islands, and that the species was recently listed as endangered in its western range. After some discussion, the representatives agreed that regional concerns could be most effectively addressed by a statewide commission. It was also determined, however, that the efforts of the Aleutian and Pribilof Islands communities would be primarily focused on the establishment of a regional commission leaving the task of the statewide Steller Sea Lion Commission to others already involved with the initiative.

Accordingly, representatives from Alaska Native communities in the Aleutian and Pribilof Islands region formed a regional marine mammal commission. The purpose of this commission is to address management and other concerns regarding those marine mammal species, including Steller sea lions, taken by these communities for subsistence use. Interim co-chairs were appointed, and it was agreed that bylaws would be drafted and circulated to the respective tribal governments for review and approval. Upon the development of a final draft, a subsequent meeting will be convened to ratify the by-laws and elect officers of the commission.

Table 3. Steller sea lion take by Alaska Natives

Year	*harvested*	*struck/lost*	*total*
1992	370	179	549
1993	348	139	487
1994	336	80	416
1995	307	32	339
1996	149	30	179
1997	164	18	146

NMFS and the Tribal Government of St. Paul worked in 1998 to develop a cooperative agreement for the co-management of Steller sea lions on St. Paul Island. The draft will undergo further development in 1999. Also in 1998, the Alaska Sea Otter Commission actively began taking up Steller sea lion advocacy and began discussions with NMFS regarding subsistence harvest and conservation issues of sea lions for other parts of Alaska.

Under section 10(e) of the ESA and section 101(b) of the MMPA, prohibitions on the taking of threatened and endangered species normally do not apply to takings by Native Alaskans if such taking is primarily for subsistence purposes and if such taking will not adversely affect the recovery of the endangered stock. To date, no action either under the ESA or the MMPA has been taken to regulate, or otherwise manage, the subsistence harvest of Steller sea lions by Alaska Native groups.

Although Steller sea lions have been a traditional subsistence resource for Alaska Natives in many areas of the state, information on harvest levels prior to the 1990s is limited. Therefore, beginning in 1992, NMFS provided funds to the ADF&G to gather information on the subsistence use of Steller sea lions in Alaska (see Table 3).

The annual subsistence take has been estimated by ADF&G on the basis of door-to-door surveys with hunters in coastal villages throughout the state. Harvest information is collected by local researchers using retrospective interview surveys in approximately 60 coastal communities, encompassing a range from Cape Newenham in the Bering Sea, west to Atka, and south and east through Southeast Alaska. ADF&G publishes an annual report containing the number of animals harvested and the number struck and lost, data on size, seasons, geographic distribution and age and sex of harvested animals. The results indicate that few animals in the eastern population are killed; the highest recorded annual harvest between 1992 and 1997 is estimated at six animals in 1992. However, the subsistence take from the western population is close to the calculated potential biological removal (PBR) level each year, and more than three-fourths of the take is by Aleut hunters from the Aleutian and Pribilof Islands.

Data from 1998 as well as the survey process are currently being evaluated. The process requires that hunters recollect their activities over the past year, which may be very difficult and therefore may lead to inaccurate data or unreliable conclusions. Nevertheless, the available information is sufficient to conclude that the annual subsistence take from the western population is approximately equal or greater than the stock's calculated PBR. NMFS will work closely with Native hunters, villages, and commissions to ensure that the annual subsistence harvest does not adversely affect the Steller sea lion population.

Subsistence Project

In September 1995, NMFS contracted with ADF&G to sample tissues from the subsistence harvest of Steller sea lions and to increase educational efforts in three Alaska Native communities known to have high annual subsistence harvest levels (St. Paul Island, St. George Island, and Unalaska). Sampling of killed animals involved collection of tissues to determine age, sex, genetic composition, physical condition, reproductive history, and exposure to anthropogenic contaminants (see Chapter X. Marine Mammal Health and Stranding Response Program). Educational efforts were intended to increase Native awareness of the plight of the Steller sea lion and to encourage local management of the subsistence harvest. The contractor, in association with the NMFS Alaska Region, held community workshops to discuss Steller sea lion recovery efforts and to inform hunters of the tissue collection project. This project was continued during 1997/98, and project reports are available.

Beluga Whales

Statewide Subsistence Harvest

The Alaska Beluga Whale Committee (ABWC) was formed in 1988 to promote healthy populations of beluga whales in Alaskan waters, to obtain better harvest information and to encourage better communication between beluga hunters, biologists, and agencies. Since its formation, the ABWC has met annually to compile reliable harvest information on beluga whale takes by Alaska Natives (see Table 4). Hunters from approximately 50 villages belong to the ABWC and report annual harvest numbers. Cook Inlet hunters are not part of the ABWC.

Table 4. 1998 Beluga Whale Harvest Data

	harvested	*struck/lost*
Beaufort Sea Stock	77	~5
Eastern Chukchi Sea Stock	50	3
Eastern Bering Sea Stock	118	15
Bristol Bay Stock	6	1

Cook Inlet Harvest

The Cook Inlet belugas *(Delphinapterus leucas)* are a small, geographically isolated remnant population of whales. The Cook Inlet population of beluga whales is separated from other beluga populations by the Alaska Peninsula.

Despite being geographically isolated for possibly thousands of years, the Cook Inlet belugas appear to have maintained a relatively high level of genetic diversity, leading researchers to believe that this population remains viable. Unfortunately, the geographic isolation of these whales, in combination with their tendency towards site fidelity, makes them vulnerable to subsistence harvests by Alaska Natives and from anthropogenic and environmental hazards. The summer habitat range used by belu-

gas in Cook Inlet appears to be decreasing; while the index count from the 1998 survey was the lowest reported to date and demonstrates a downward trend that has been ongoing over the last five years.

The population declined by 15% per year between 1994 and 1998. The 1998 aerial survey estimate (347) is nearly 50% lower than the 1994 estimate (653).

While historical abundance estimates are not available, Native hunters have stated that this stock numbered at least 1,000 animals as recently as the 1980s. With the current estimated rates of natural mortality and Native harvest, there is concern that the beluga population in Cook Inlet cannot be sustained by annual recruitment and could become extinct. Loss of this population would represent a significant gap in the southern range of the taxon, as this is the only beluga to exist in the Gulf of Alaska.

NMFS, in conjunction with the ABWC and the Cook Inlet Marine Mammal Council, initiated a status review of Cook Inlet beluga whales in November 1998 to determine whether designation under the MMPA or a change in listing classification under the Endangered Species Act (ESA) is warranted. This review will be completed in Spring 1999. As of December 1998, the Cook Inlet beluga whale is considered a "candidate" species under the ESA.

International Whaling Commission

Under section 108(1) of the MMPA, the Secretary of Commerce is mandated to :

"...initiate negotiations as soon as possible for the development of bilateral or multinational agreements with other nations for the protection and conservation of all marine mammals covered by this Act."

As a result, the Departments of Commerce, the Interior, and State, in consultation with the Marine Mammal Commission, must pursue international agreements, and, when necessary, negotiate new agreements, to achieve the purposes of the MMPA. This section describes NMFS involvement with International Whaling Commission (IWC) and its programs and activities pertaining to marine mammals during 1998.

The International Convention for the Regulation of Whaling (ICRW) was established in 1946 with the objective of achieving proper conservation of world whale stocks, thus making possible the orderly development of the whaling industry. The Convention created the IWC to provide for a continuing review of the condition of whale stocks and for such additions to or modifications of the agreed conservation measures as might appear desirable. In the United States, the treaty is implemented through the Whaling Convention Act of 1949.

Past actions by the IWC include the establishment of a whale sanctuary in the Indian Ocean area and in the Southern Ocean, prohibition on the use of cold grenade (non-exploding) harpoons to kill whales for commercial purposes, a moratorium on all commercial whaling from the beginning of the 1985-86 pelagic and 1986 coastal seasons, and the adoption of a separate and distinct management scheme for aboriginal subsistence whaling.

Commercial and Scientific Whaling

The IWC continues to maintain the moratorium on commercial whaling. However, Norway lodged an objection to the 1982 moratorium decision, and therefore is not bound by that decision. Thus, it continues to take minke whales from the Northeast Atlantic Ocean.

Article VIII of the ICRW grants countries the right to issue permits to kill whales for scientific purposes. Annually, Japan takes about 540 minke whales *(Balaenoptera acutorostrata)* from the North Pacific and Antarctic Oceans for scientific research. During the 1998/1999 season, Japan took 389 minke whales within the Southern Ocean Sanctuary. During its 1998 season in the North Pacific, Japan also accidently took one Bryde's whale *(Balaenoptera edeni)*.

Aboriginal Subsistence Whaling

Aboriginal subsistence whaling, in accordance with limitations set by the IWC, is conducted by aboriginal Natives in Greenland, Russia, St. Vincent and the Grenadines, and the United States. In addition, although not currently an IWC member, Canada has continued to

authorize the taking of bowhead whales *(Balaena mysticetus)* by its Natives.

In 1996, the United States certified Canada under the Pelly Amendment for whaling outside the IWC provisions. The Pelly Amendment to the Fishermen's Protective Act of 1967 (22 U.S.C. 1978) requires the Secretary of Commerce to monitor the activities of foreign fishermen and certify when nationals of a foreign country are found, directly or indirectly, conducting fishing operations that diminish the effectiveness of an international fishery conservation program to which the United States is a party. The Secretary of Commerce has certified, under Pelly, several countries, including Norway, Russia, Japan and Canada, for whaling activities.

The 1998 Annual Meeting

The 50th Annual Meeting of the International Whaling Commission (IWC) was held from May 16-20, 1998 in Muscat, Oman. Topics of discussion at this meeting follow.

In 1982, the IWC decided that catch limits for all commercial whaling would be set to zero. At that time, Norway lodged an objection to the ban and has since exercised its right to set national catch limits for its coastal whaling operations for minke whales. As it has in previous years, the IWC passed a resolution in 1998 calling on Norway to halt all whaling activities under its jurisdiction.

As in previous years, the IWC did not adopt Japan's proposal for an interim relief allocation of 50 minke whales to be taken by coastal community-based whaling.

The IWC noted that work on a number of issues, including specification of an inspection and observer system, must be finished before it can consider adopting the Revised Management Scheme (RMP). The IWC adopted a resolution that confirmed how anthropogenic removals (*e.g.*, incidental catches, catches under scientific permit, aboriginal subsistence whaling) other than commercial catches should be taken into account when setting catch limits under the RMP.

At the 1997 IWC annual meeting, Ireland introduced a proposal for discussion intended to encourage resolution between the governments opposed to and in favor of a resumption of commercial whaling. It included: completion and adoption of the RMP; designation of a global sanctuary for whales with limited coastal whaling; prohibition of international trade in whale products; and the ending of lethal scientific research takes. Although little progress toward reaching compromise was made, the IWC agreed to keep this item on the agenda.

No changes were made to the catch limits for whale stocks subject to aboriginal subsistence whaling made in 1997. The Scientific Committee continued to make progress towards developing new management regimes for aboriginal subsistence whaling; this work has been given high priority by the IWC.

Japan again proposed two scientific research programs - one in the Antarctic and one in the western North Pacific. The IWC adopted a resolution calling on the Government of Japan to refrain from issuing these permits.

The IWC adopted a resolution providing advice to its Scientific Committee on the objectives of the Southern Ocean Sanctuary. These objectives include monitoring depleted populations and undertaking research on the effects of environmental change. The Scientific Committee is currently developing a major cooperative research program with the Southern Ocean Global Ocean Ecosystems Dynamics (GLOBEC) program and Conservation of Antarctic Marine Living Resources (CCAMLR) in the Southern Ocean Sanctuary for the years 2000 and 2001.

In 1998, the IWC strengthened its commitment to studying environmental changes and their effects on cetaceans by establishing a new agenda item on environmental concerns. It reiterated its support for two major collaborative research initiatives made by its Scientific Committee with respect to chemical pollutants and baleen whale habitat and prey studies in cooperation with CCAMLR and Southern Ocean GLOBEC. Furthermore, the IWC committed to proposing a consideration next year on the establishment of a major research fund for environmental studies.

The IWC approved the establishment of a major new scientific journal on cetacean research and management, which goes into print in 1999. The IWC hopes that this journal will maintain and improve the high quality of scientific publications published by the IWC.

Chapter IX. Permit Programs

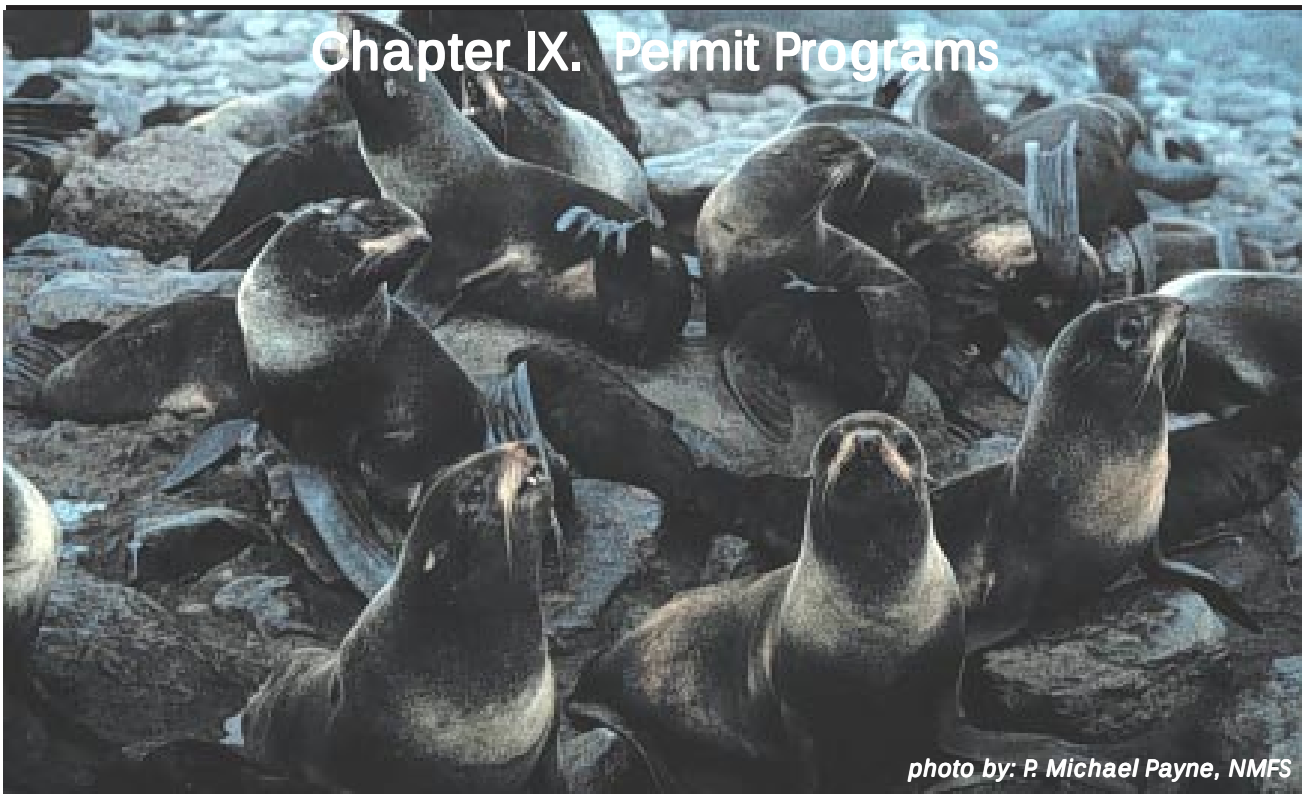


photo by: P. Michael Payne, NMFS

The Marine Mammal Protection Act (MMPA) places a moratorium, subject to certain exceptions, on the taking and importing of marine mammals and marine mammal products. One exception to the moratorium provides for the issuance of permits by NMFS for specific marine mammal species. NMFS also administers provisions within its permit program, pursuant to the MMPA, the Endangered Species Act (ESA), and the Fur Seal Act (FSA), as they apply to species under the jurisdiction of the Secretary of Commerce. Under these statutes, permits may be issued for public display, scientific research, enhancement, and photography.

Between January 1, 1998 and December 31, 1998, NMFS issued 37 permits. Of these, two were issued for scientific research and enhancement, 30 were issued for scientific research, and five were issued for photography. In addition, six letters of confirmation were issued for "Level B harassment" under the General Authorization for Scientific Research.

NMFS also processes permit amendments if the proposed modifications meet the appropriate statutory and regulatory standards, as well as other permit-related authorizations. There are two amendment categories: major and minor. A major amendment, including a request for extension of a permit by more than 12 months beyond its original term, is subject to the same notice, review and comment procedures as a permit application. During the 1998 reporting period, 29 major permit amendments and 29 minor permit amendments were processed.

Permit Regulations

On May 10, 1996, NMFS published a final rule in the *Federal Register* that amended the regulations for permits under the MMPA, the ESA and the FSA (61 FR 53320). This rule updates and consolidates the regulations for special exception permits and establishes basic permit requirements applicable to all permits to take, import, and export marine mammals and marine mammal parts for purposes of scientific research and enhancement, photography, and public display under the MMPA. It also provides additional permit criteria specific to scientific research and enhancement only and establishes administrative procedures for determining the releasability or non-releasability of stranded marine mammals and their disposition after release.

The 1996 final rule did not include the additional requirements specific to photography or public display established by the MMPA Amendments of 1994. NMFS plans to publish a separate proposed rule in 2000 for public comment for public display permits including marine mammal transfer and inventory reporting requirements. A proposed rule for photography permits will also be considered in 2000.

Photography Permits

The 1994 MMPA Amendments established a new provision to allow marine mammals in the wild to be photographed for educational and commercial purposes. These permits are limited to "Level B" harassment of non-endangered marine mammals and require that the photographic products be made available to the public. Until final regulations are published, NMFS limits the authorization of photographic activities to one year and requires a report on the activity and its effect on the marine mammals within 60 days of the completion of the photographic work. During 1998, five permits were issued for commercial photography.

Retention of Stranded Marine Mammals

Beached or stranded marine mammals taken under the authority of section 109(h) of the MMPA may be held only for the purpose of rehabilitation until:

> 1) the animal is returned to its natural habitat;
> 2) NMFS concurs with a determination by the attending veterinarian that it is not feasible to return the animal to its natural habitat and permanent holding is authorized by NMFS; or
> 3) NMFS authorizes the permanent retention of the animal as a substitute for the capture of one of the same species from the wild even though the attending veterinarian determines that the animal is releasable.

The permanent retention of a rehabilitated beached or stranded marine mammal must be authorized by NMFS, in accordance with applicable MMPA requirements, before a non-releasable animal may be retained by the rehabilitating facility or transported or exported to another facility for public display purposes. Additionally, the recipient or retaining facility must meet the three public display criteria above. During 1998, one beached and stranded marine mammal was determined non-releasable and was retained by a domestic facility for public display purposes.

Level B Harassment is defined in U.S.C. 1362 Sec. 3 (18)(A)(2) as any act of pursuit, torment, or annoyance which --

"has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption or behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering."

A permit is required to retain or obtain rehabilitated beached and stranded marine mammals for purposes of scientific research, enhancing the survival or recovery of marine mammal species or stocks or to retain a releasable marine mammal for purposes of public display in lieu of a capture. No applications for a permit to retain a releasable marine mammal were submitted to NMFS during the 1998 reporting period. For more information on marine mammal strandings, see Ch. x. The Marine Mammal Health and Stranding Response Program.

General Authorization

The MMPA Amendments of 1994 also required NMFS to issue a General Authorization (GA) and implementing regulations for bona fide scientific research involving "Level B harassment" of marine mammals in the wild. In lieu of a scientific research permit, the GA provides a simplified process for authorizing research activities involving low levels of harassment (this does not include species listed as endangered or threatened under the ESA). Research activities that are expected to cause no more than "Level B harassment" include photo-identification studies, behavioral observations, and vessel and aerial population surveys. An Interim Final Rule was published on October 3, 1994 (59 FR 50372). NMFS received comments on the interim final rule and expects to publish a final rule in 2000.

From January 1, 1998 through December 31, 1998, NMFS received five letters of intent to conduct "Level B" harassment on marine mammal species or stocks for scientific research purposes; six proposals were approved, including one proposal that was received in 1997.

Marine Mammal Inventory

Information on marine mammals held in captivity must be submitted for purposes of the Marine Mammal Inventory. At the end of 1998, the marine mammal inventory data base included 2,229 live marine mammals, and provides animal-specific data such as animal identification, sex, estimated or actual birth date, date of acquisition or disposition by the holder, source of acquisition including location of the take from the wild, if applicable, name of recipient if animal is transferred, notation if animal was acquired as the result of a stranding, and date and cause of death. Holders of marine mammals are required to submit to NMFS reports of births and deaths within 30 days of the event, and a 15-day notification prior to any sale, purchase, export, or transfer.

Section 104(c)(2)(A) of the MMPA allows for the public display of marine mammals provided that the holder:

> 1) offers a program for education or conservation purposes that is based on professionally recognized standards of the public display community;
> 2) is registered or holds a license under the Animal Welfare Act (AWA); and
> 3) maintains facilities for the public display of marine mammals that are open to the public on a regularly scheduled basis and not limited or restricted in access except for admission fees.

To ensure compliance with the statutory requirements, and in conjunction with ongoing efforts to reduce and streamline reporting and notification requirements, NMFS has entered into a Cooperative Agreement with the International Species Information System (ISIS) to administer the captive marine mammal inventory database, including marine mammal transport notifications. ISIS is an international membership organization that manages a database and information system for wild animal species in captivity, including marine mammals. Under this cooperative agreement, ISIS will manage the captive marine mammal inventory information as part of the central ISIS captive wildlife database and information system. Many of the marine mammal holders who report inventory information and transfer/transport notifications under the MMPA also voluntarily contribute their inventory information to ISIS. It is estimated that one-half of the marine mammal specimens are reported separately to both databases.

In this regard, the major objectives of this Cooperative Agreement are to: eliminate current duplication of data collection efforts; improve the long-term efficiency and quality of the captive Marine Mammal Inventory and Transfer/Transport database; increase convenience and efficiency; reduce cost and burden, for reporting required under the MMPA by all holders of marine mammals; enhance public access to the captive marine mammal information; and avoid duplication of development and maintenance of expensive custom inventory database software by ISIS and NMFS. The new procedures associated with ISIS' future administration of the Marine Mammal Inventory and transfer/transport notifications will be outlined in the proposed rule for public display is scheduled to be published in 2000. Holders will continue to submit reports to NMFS until they are officially notified of the transition to ISIS.

Exports of Marine Mammals

Marine mammals may be exported from U.S. facilities as long as the foreign recipient meets requirements comparable to those a U.S. recipient must meet. Because foreign facilities are not subject to licensing or registration requirements under the AWA, it is only through the MMPA's comparability requirement that adequate care of marine mammals transferred to foreign facilities can be assured. Following a policy established in 1975, NMFS continues to require the foreign government with jurisdiction over the facility to provide a certification that includes a comity statement to enable NMFS to enforce the comparability provisions of the MMPA once the animals have been exported.

Table 1. Live Marine Mammals of U.S. Origin Tranported or Exported in 1998

#	Species	Origin	Destination
1	killer whale *(Orca orcinus)*	Oregon Coast Aquarium	Klettsvik Cove, Iceland
2	bottlenose dolphins *(Tursiops truncatus)*	Knies Kinderzoo in Switzerland	Mundomar Theme Park in Benidorm, Spain
3	Patagonian sea lions *(Otaria byronia)*	United States	Palacio de los Deportes in Mexico City for a one-month tour with the Ringling Bros. and Barnum and Bailey
5	California sea lions *(Zalophus californianus)*		
1	harbor seal *(Phoca vitulina)*	Marine Life Oceanarium, Gulfport, Mississippi	Canada's Wonderland, Ontario, for a seasonal exhibit

NMFS conducted a legal analysis of this policy in 1997 and concluded that the requirements are reasonable within the context of the MMPA. This policy will be reflected in the proposed rule for public display to be published in 2000 and will be available for public comment at that time.

During 1998, eleven live marine mammals were exported (see Table 1). As part of the comity arrangements made for exports, inventory of exported U.S.-source animals is maintained by NMFS.

Keiko the Killer Whale

NMFS continued discussions in 1998 with the Free Willy Keiko Foundation concerning possible plans for the future release of "Keiko," a captive killer whale *(Orcinus orca)* that attracted worldwide attention for his starring role in the movie "Free Willy." The permit issued in September 1995 for the import of this animal includes a condition requiring a scientific research permit be in place prior to release. Exercising its right to export "Keiko" for public display purposes under the MMPA, on September 8, 1998, the Foundation relocated "Keiko" to a sea pen in Klettsvik Cove, Iceland, for public display, while continuing to evaluate whether an eventual release is appropriate.

Captive Care of Marine Mammals

When the MMPA was amended in 1994, NMFS' role in specifying care and maintenance standards for captive marine mammals was eliminated. This responsibility now belongs solely to the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS). To implement this change, NMFS took the lead in revising a 1979 Memorandum of Agreement (MOA) among NMFS, U.S. Fish and Wildlife Service and APHIS. Several meetings were held during 1997-1998 with the parties and representatives of the Marine Mammal Commission to resolve several areas of concern including the responsibilities, jurisdiction, and determinations associated with the export of marine mammals to foreign facilities. A final agreement was signed on July 21, 1998, that promotes the effective and cooperative implementation of the MMPA and the AWA particularly as they relate to the standards governing the humane handling, care, treatment, and transportation of captive marine mammals. The MOA seeks to ensure that the respective responsibilities of the agencies under the MMPA and AWA are met efficiently and with a minimum of duplication.

Public Display Permit Applications

There were no public display applications submitted in 1998; however, in February 1998, the Oregon Coast Aquarium (Aquarium) and the Free Willy Keiko Foundation jointly requested that the public display permit issued in 1995 to the Aquarium be amended to change the Permit Holder from the Aquarium to the Foundation. NMFS amended the permit on March 20, 1998, determining that: the Foundation has the responsibility for and the authority to determine the disposition of Keiko; the Foundation met the three criteria for holding marine mammals for purposes of public display; and for Marine Mammal Inventory purposes, the holder of record should be the Foundation.

Closure of the Maine and Depoe Bay Aquariums

After declaring bankruptcy during the summer of 1997, the Maine Aquarium went into receivership of the Small Business Administration. In September 1997, APHIS notified NMFS that the aquarium no longer held a valid Exhibitor's license under the AWA. APHIS determined that they could not take action under the AWA to place its harbor seals *(Phoca vitulina)* in an appropriate home and asked NMFS for assistance to ensure that the public display requirements under the MMPA would be upheld. APHIS offered the assistance of a veterinarian inspector who was familiar with the situation, and the Detroit Zoo was contacted and agreed to take custody of the seals. On January 3, 1998, the NMFS Offices of Protected Resources and Northeast Region Enforcement took temporary custody of the two harbor seals until the Detroit Zoo's personnel arrived on January 4, 1998.

In a June 1998 settlement between Depoe Bay Aquarium and APHIS, three marine mammals were turned over to APHIS for relocation. Working cooperatively with all parties to expedite permanent placement, NMFS authorized several transports with less than the 15-day advance notification required by the MMPA. The animals were temporarily relocated to Oregon Coast Aquarium, and eventually, two California sea lions *(Zalophus californianus)* were placed at the Children's Zoo, Fort Wayne, Indiana, and one harbor seal was placed at Sea World, San Diego, California.

Enforcement Actions

Sugarloaf Dolphin Sanctuary Case

In January 1998, NOAA filed charges against several dolphin freedom activists for harassing and illegally transporting two captive bottlenose dolphins *(Tursiops truncatus)* in connection with their deliberate release six miles off the coast of Key West, Florida on May 23, 1996. Alleging multiple violations of the Marine Mammal Protection Act, NOAA assessed a maximum allowable $10,000 for each of the six counts charged, resulting in a total of $60,000 in penalties against those involved.

Charges were filed against Richard O'Barry of Coconut Grove, Florida, Lloyd Good, III, of Sugarloaf Key, Florida, Sugarloaf Dolphin Sanctuary, Inc., of Sugarloaf Key, Florida, and the Dolphin Project, Inc., of South Miami, Florida. All four were charged with an illegal "take" by harassment and illegal transportation of each dolphin. Both the Sugarloaf Dolphin Sanctuary and The Dolphin Project were also charged with failing to notify NOAA prior to the transport of the dolphins.

The dolphins were transported without prior notification and not for purposes of public display, scientific research, or enhancement or survival of the species or stock. After the dolphins were released to the wild, one of the dolphins appeared in a congested Key West marina with lacerations and begging for food. The second dolphin, found over 40 mi (64 km) away almost two weeks after the release, also sustained deep lacerations and was emaciated. After determining that the dolphins were injured and in need of treatment, NMFS, with the help of others, rescued and provided veterinary care to the dolphins. Following initial treatment, one dolphin was transported to the U.S. Navy facility in San Diego, California for rehabilitation. The other dolphin was found to be in considerably worse condition requiring extended rehabilitation, and at the end of 1998, still remained at a U.S. Department of Agriculture licensed marine mammal public display facility in the Florida Keys.

NMFS officials later seized a third dolphin from the Sugarloaf Dolphin Sanctuary, after officials with the U.S. Department of Agriculture suspended the facility's license for multiple violations of the Animal Welfare Act. The dolphins had been on public display at the Sugarloaf Lodge motel in Sugarloaf Key since 1994. Prior to that, these dolphins were part of the U.S. Navy's marine mammal research program, and had been in captivity since the late 1980s.

In order to protect the health and welfare of animals, any release of a long-term captive marine mammal should be conducted only under an MMPA scientific research permit. Applications for such permits are subject to scientific and public review, and would involve the development of a release protocol that addresses important concerns such as whether: 1) a released animal is properly and humanely prepared to live in the wild; 2) long-term follow up monitoring of the animal is conducted; 3) wild marine mammals are affected; and 4) contingency plans are in place if it is necessary to rescue a released animal.

Wildlife experts agree that releasing captive marine mammals has the potential to hurt both the released wild and captive animals and the wild marine mammals they encounter. Experts are concerned about the ability of a released animal to hunt for food, defend itself from predators, and avoid interactions with people and boats. Other concerns include disease transmission and unwanted genetic exchange between a released animal and wild marine mammal stocks, and any behavioral patterns developed in captivity that could affect the social behavior of wild animals as well as the social integration of the released animal.

A civil hearing regarding this case is scheduled for early 1999.

Charges Filed Against Commercial Operation for Feeding Wild Dolphins

In July 1998, NOAA charged the operator, crew member, rental company, and owner of a Florida vessel with five civil violations of feeding or attempting to feed wild dolphins, which is a violation of the MMPA regulations. A total civil penalty of $5,000 was assessed in a Notice of Violation and Assessment (NOVA) against Thomas E. Rainelli (the operator), Chanti Hance (the crew member), Hathaway's Boat Rentals, Inc. (the rental company), and Tropical parasail, Inc., (the owner) for the charged violations, which occurred on June 17, 1998 near Panama City, Florida. The Florida Marine Patrol initiated the case. The assessment was made after the NMFS Office of Law Enforcement completed the investigation. A civil hearing regarding this case is scheduled for 1999.

Chapter X. Marine Mammal Health and Stranding Response Program

photo courtesy of: The Marine Mammal Center

In 1992, the Marine Mammal Health and Stranding Response Act (MMHSRA) was enacted and became Title IV of the Marine Mammal Protection Act of 1972 (MMPA). It contains three basic elements: Marine Mammal Stranding Networks; Response to Unusual Mortality Events; and the National Marine Mammal Tissue Bank.

To implement the Act, NMFS has instituted the Marine Mammal Health and Stranding Response Program (MMHSRP) that includes:

- stranding networks and disentanglement networks;
- response to unusual mortality events;
- biomonitoring, research and development;
- the National Marine Mammal Tissue Bank;
- quality assurance; and
- information management.

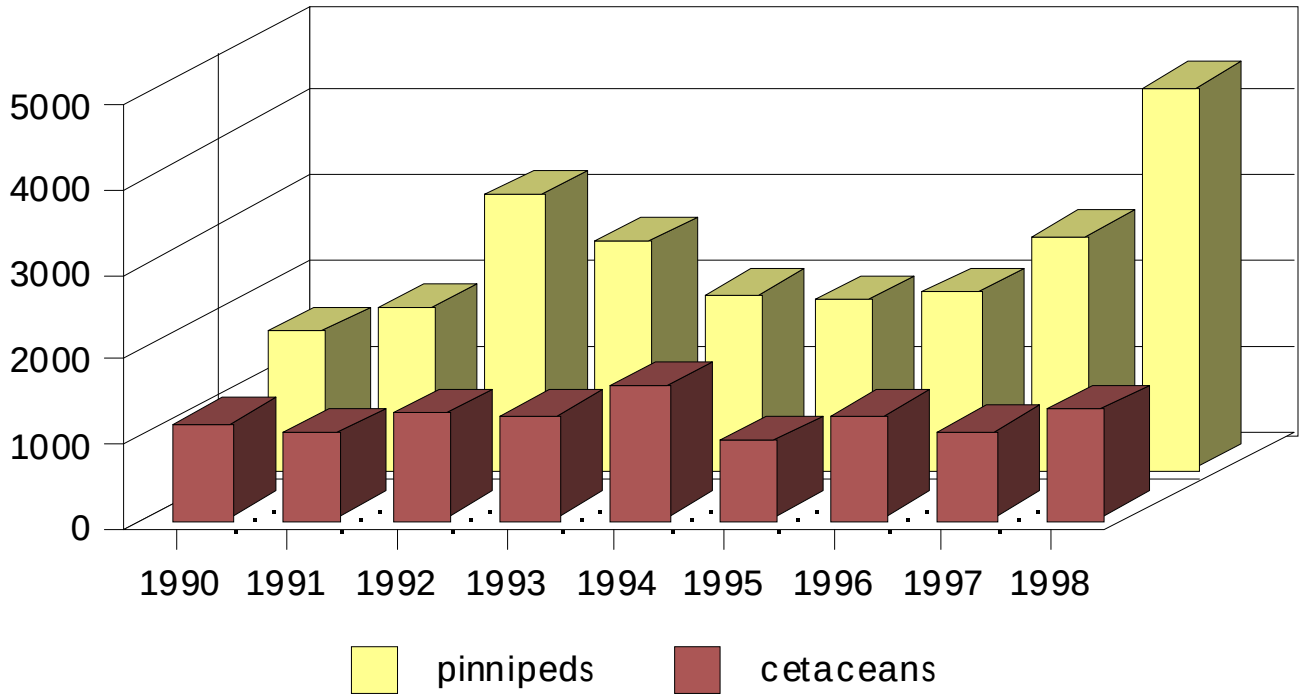
Stranding Networks

Marine Mammal Stranding Networks have been established in each of NMFS' five regions and consist of organizations, facilities, or individuals that meet minimum requirements as designated in a Letter of Agreement (LOA) for marine mammal responses and can be states, aquaria, universities, or non-profit organizations. Most of the people carrying out the responsibilities of the stranding networks are volunteers. Different levels of authorization may apply (*e.g.*, response to live stranded animals is generally limited to those institutions that have medical expertise and the physical facilities to rehabilitate animals).

As a part of their LOA, network members are required to collect certain basic biological data from strandings (Level A data) including species name, sex, length, location, and any evidence of human interaction. In addition, they are encouraged to collect other data and tissues for use in scientific research, for determination of cause of death, for additional evidence of human interactions, for educational purposes, for life history investigations and other biological or health research needs.

Overall, 1998 was a record year for numbers of reported strandings - 5,726 stranded animals were reported to the stranding networks nationally. This represents the highest reported strandings in the last decade, exceeding the

Figure 1. Marine Mammal Strandings in the United States 1990-1998



previous high recorded during the El Niño year of 1992 (4,445). Over the previous eight years, national strandings averaged 3,415 animals per year (range from 2,704 to 4,455) with a trend for increased reporting as efforts increased in various regions. The increase in 1998 was most evident on the West coast with California recording the highest numbers of animals, principally pinnipeds. Pinniped strandings peaked in 1992 and 1998, both El Niño years, with the West Coast strandings driving the increases. The stranding networks worked extremely hard this year to respond to and collect a significant amount of data from these strandings. The following is a breakdown by region of the stranding events in 1998.

Northeast Region Stranding Network

The Northeast network consists of LOA holders in ten states from Maine to Virginia. A total of 801 marine mammal strandings were reported in the Northeast Region in 1998. These reported strandings included 518 pinnipeds and 283 cetaceans.

It was noted in 1997 that the increasing trend in strandings of ice seals had stabilized in the Northeast, as shown by fewer harp *(Phoca groenlandica)* (119) and hooded *(Cystophora cristata)* (40) seal strandings in 1997 than in 1996 (153 and 46 respectively). In 1998, although the number of stranded harp seals did not change significantly (107) from 1997, hooded seal strandings more than doubled from 1997's rate (40) to a high of 106. As indicated in 1997, most of these animals showed signs of nutritional stress and were often in a weakened state when found. There were a total of 36 pinnipeds (eleven gray seals *(Halichoerus grypus)*, 24 harbor seals, and one harp seal) that exhibited evidence of human interaction in the Northeast Region. The types of human interaction documented were: fishery interaction (10), mutilation (1), ship strike (1), power plant entrainment (10), oil spill (4), gun shot (1), and other (9).

Although bottlenose dolphins *(Tursiops truncatus)* (69) and harbor porpoises *(Phocoena phocoena)* (54) typically make up most of the cetacean strandings in the Northeast, a mass stranding of Atlantic white-sided dolphins *(Lagenorhynchus acutus)* (90) made them the most frequently stranded cetacean species in the Northeast Region in 1998 (see below). The number of minke whale *(Balaenoptera acutorostrata)* strandings (5) dropped back

down from last year's high (15). Of the 23 large whale strandings in the Northeast, three showed evidence of human interactions, with two being fishery related, and one being a ship strike. Of note, a blue whale *(Balaenoptera musculus)* stranded in Rhode Island on March 7, 1998. Many scientists were involved in the examination of this carcass from a species, which has only rarely stranded on the East Coast.

One mass stranding occurred in the Northeast region in 1998. In Cape Cod, Massachusetts, beginning January 30, 1998 and extending over the next ten days, there was a mass stranding of 81 Atlantic white-sided dolphins *(Lagenorhynchus acutus)*, and 16 common dolphins *(Delphinus delphis)*. Full necropsies were performed on many of the animals, and at least Level A was collected on the rest. Tissues and blood were obtained for the National Marine Mammal Tissue and Serum Banks.

Southeast Region Stranding Network

The NMFS Southeast Region stretches from South Carolina to Texas and includes Puerto Rico and the U.S. Virgin Islands. In 1998, the Southeast Region reported 685 marine mammal strandings. This is up from 1997 (608), but still less than 1996 (795). There was an increase of pinniped strandings from three in 1997 to 13 in 1998. In 1998, all of the pinniped strandings in the Southeast Region were harbor seals. The vast majority of Southeast strandings were cetaceans (672). Consistent with previous years, bottlenose dolphins comprised the majority of cetacean strandings (523); however, several other cetacean species experienced substantial increases in stranding rates. Listed with the 1997/1998 stranding numbers for comparison, these were the: pygmy sperm whale *(Kogia breviceps)* (4/39), Gervais' beaked whale *(Mesoplodon europaeus)* (2/14), and Cuvier's beaked whale *(Ziphius cavirostris)* (1/4).

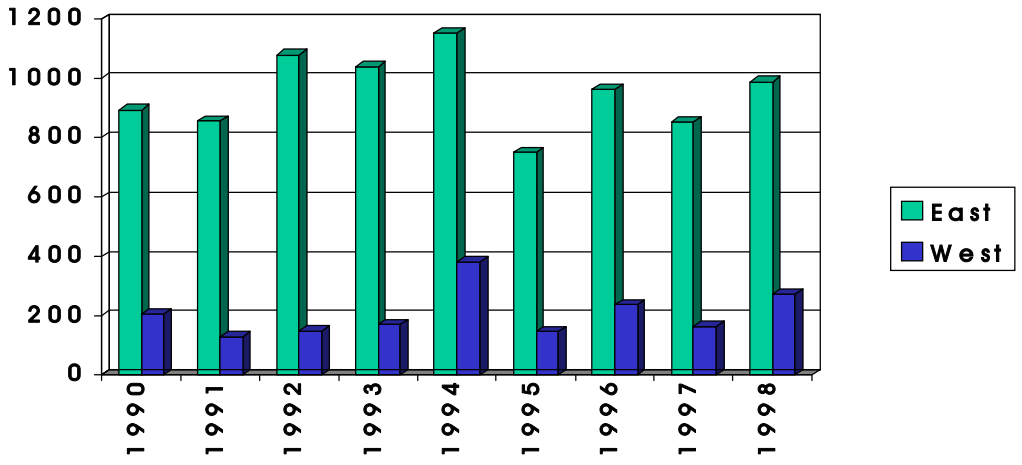
There were 74 live strandings, 32 of which were taken to rehabilitation facilities, six were released back into the wild (four rough-toothed dolphins and two bottlenose dolphins), and one was deemed non-releasable (a bottlenose dolphin) and was transported to the Mystic Aquarium. There were three mass strandings in the Southeast in 1998 including: 1) 12 rough-toothed dolphins *(Steno bredanensis)* (see below), 2) 12 short-finned pilot whales (Northeast Florida in January), and 3) four Gervais' beaked whales (in North Carolina in September). The mass stranding of rough-toothed dolphins occurred on December 28, 1998 on Panama City Beach, Florida just 35 miles west of a similar stranding event that occurred with this species one year prior. During this event, 12 animals initially stranded, the animals were pushed back out to sea, and seven re-stranded. All seven were taken to rehabilitation facilities but either died in transport or shortly after arrival at the rehabilitation centers. The animals were all adults ranging in age from 14 to 35 years with the exception of one year old calf. Fifty-eight % of the stranded animals were females and 16% were males.

Again recognizing that most stranded marine mammals on the East Coast are very decomposed, detection of human interactions is often not possible. There were 55 strandings that exhibited evidence of human interaction, primarily fisheries interactions in North (24) and South Carolina (8), although human interaction was documented in strandings from Texas (5), Louisiana (5), Florida (4), Alabama (2), and Georgia (1) as well.

Southwest Region Stranding Network

The NMFS Southwest Regional stranding network is comprised of two distinct areas, California on the U.S. mainland and the islands of Hawaii, American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, and other islands of the Pacific. In 1998, there were a reported 3,612 strandings in the Southwest Region. This is a significant increase from last year's also elevated stranding count at 2,176, and is the largest El Niño year reported number of strandings in the 1990s. As is typical for the Southwest Region, these strandings were primarily comprised of pinnipeds (3,568) stranding in California. Similar to 1997, the dramatic increase in pinniped strandings [mostly California sea lions *(Zalophus californianus)* (2,576), northern elephant seals *(Mirounga angustirostris)* (409), and harbor seals *(Phoca vitulina)* (313)] for 1998 was due to the continued influence of the El Niño weather event, which raises the water temperature near the coastline, moving the preferred prey items into deeper, less accessible waters. These changes make foraging difficult for newly weaned pups. As a

Figure 3. Cetacean Strandings East Coast vs. West Coast



result, many do not survive the yearling stage. In addition, many young nursing pups do not survive to weaning, as their mothers take extended feeding trips, are not able to nurse them as often, and the pups die due to extreme malnourishment. The forced change in prey items may also make the pinnipeds more susceptible to the introduction of "new" pathogens such as parasites and other disease-causing organisms.

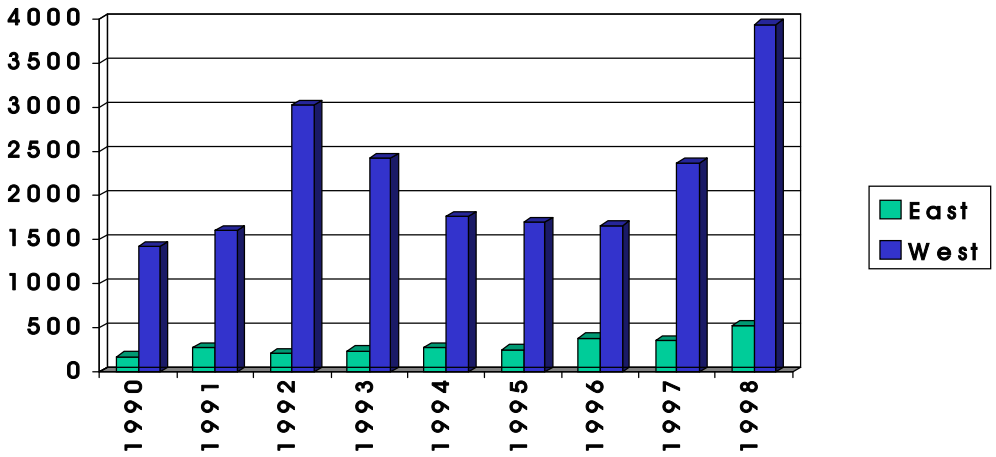
As a result of the large numbers of pinniped strandings, most marine mammal rehabilitation centers were at maximum capacity for much of 1998. This led to the enactment of a 48-hour "wait and see" policy, prior to any rescue attempts, for all beach-stranded pinnipeds for Orange , Los Angeles, and Ventura Counties in California. This policy encouraged stranding network participants to focus their attention and resources on only those animals that required immediate attention. The waiting period did not apply to those animals suffering from human-related injuries, such as gunshot, boat propeller, and fishing gear entanglements. Those animals received priority attention.

After the 48-hour observation period for any given animal, NMFS reevaluated each of the stranding facilities' capacity status, and either recommended that the animal be brought in for treatment if space was available, or left the animal on the beach for a continued watch. The stranding and rehabilitation centers are to be commended for their hard work and dedication in this stressful and overwhelming year.

In addition to the El Niño strandings, there was an unusual mortality event of over 70 California seal lions in Central California associated with a harmful algal bloom (see Unusual Mortality Events section of this chapter). Finally, gray whale *(Eschrichtius robustus)* strandings continued to increase in California from six strandings in 1997 to 30 in 1998. Much of the increase resulted from winter strandings of calves in California.

In 1998, Hawaiian strandings consisted of eight cetaceans: two humpback whales *(Megaptera novaeangliae)*, two melon-headed whales *(Peponocephala electra)*, one pygmy sperm whale *(Kogia breviceps)*, one bottlenose dolphin *(Tursiops truncatus)*, one Cuvier's beaked whale *(Ziphius cavirostris)*, and one unidentified cetacean. Of these, one of the melon-headed whales and the pygmy sperm whale stranded alive. The melon-headed whale was transported to Sea Life Park in Waimanalo on Oahu

Figure 4. Pinniped Strandings East Coast vs. West Coast



for rehabilitation, and the pygmy sperm whale was stabilized overnight and released the following day.

Northwest Region Stranding Network

The Northwest Regional stranding network covers the coasts of Oregon and Washington including the Puget Sound coastline. The NMFS Northwest Region stranding networks reported a total of 392 strandings in 1998, of which 320 were pinnipeds [mostly California sea lions (75) and harbor seals (121)] and 44 cetaceans. This was an increase from the number of total strandings in the Northwest in 1997 (274), and again is most likely related to El Niño.

Sixteen of the stranded pinnipeds exhibited evidence of human interaction, including: California sea lions (9) and harbor seals (7). Of these, six were determined to be the result of fishery interaction, and ten showed evidence of gun shot. Human interaction reports have continued to increase in the Northwest and Southwest Regions. This may be partially due to the increasing pinniped populations on the West Coast of the United States, the increased competition for resources between pinnipeds and humans, and the increased reporting and examinations of carcasses.

Alaska Region Stranding Network

The Alaska Region stranding network covers a tremendous amount of coastline, however, much of it is uninhabited or inaccessible. Therefore the actual number of strandings is likely higher than the reported numbers. In addition, reporting of strandings often reflect incidental sightings, making determination of true annual increases difficult. A total of 72 cetaceans and 40 pinniped strandings were reported to the Alaska Region for 1998. The doubling in cetacean strandings from 1997 (26) can be partially attributed to a mass stranding of beluga whales *(Delphinapterus leucas)* (30) in upper Cook Inlet. No mortalities were reported in this mass stranding.

Disentanglement Network

A specialized subset of the stranding networks on the East Coast of the United States is the large whale disentanglement network. NMFS established a large whale disentanglement program as recommended by the Final Recovery Plan for the Northern Right Whale. This program involves: (a) a multi-agency and institution network to locate, monitor, and safely disentangle marine mammals; (b) maintenance of a database for entanglements, providing data access and periodic reports to users; and (c) development of regional protocols and plans,

including outreach to the general public. In the past, disentanglement efforts have focused on right whales in the Gulf of Maine/Bay of Fundy. In 1998, NMFS expanded the large whale disentanglement network to the Mid-Atlantic and the Florida/Georgia border and included fishers, U.S. Coast Guard and emergency personnel, and other large whale biology teams (for more information see Chapter VII. Conservation and Recovery).

Large whale disentanglement activities are coordinated by NMFS Northeast and Southeast Regional Stranding Coordinators, but are primarily carried out by specially-trained personnel (not members of the stranding networks). The Center for Coastal Studies in Provincetown, MA holds the contract for response and training for large whale disentanglements, although much of the coordination of these efforts is carried out by the NMFS Northeast and Southeast Regional Stranding Coordinators. Basic training was provided in 1998 to commercial fishermen in the State of Maine and to biologists, U.S. Coast Guard personnel, and emergency response personnel in the Mid-Atlantic in December 1998. Additional training for disentanglement was provided to fishers and biologists in Alaska. In addition, caches of disentanglement equipment were placed in the Mid-Atlantic year round and in the Florida/Georgia area during seasonal right whale presence. In 1998, coordination of the disentanglement network in the Northeast and Southeast became the responsibility of the regional stranding coordinators.

On the East Coast in 1998, the network reported 22 whales entangled in gear, including one fin whale *(Balaena physalus)*, one minke whale *(Balaenoptera acutorostrata)*, 15 humpback whales *(Megaptera novaeangliae)*, and five right whales *(Eubalaena glacialis)*. Three of these entanglements were fatal: one fin, one minke, and one humpback. Disentanglement efforts were made on nine animals and resulted in either partial or complete removal of gear on all nine animals.

Stranding Training

Both the Northeast Regional and the Southeast Regional networks had Stranding Workshops which included discussions, presentations and necropsy workshops. The Northeast meeting was hosted by the Virginia Marine Science Museum on March 27-29, 1998. The Southeast meeting was held in St. Petersburg, Florida on March 12-13, 1998 and was jointly hosted by Eckerd College and the Pathobiology Laboratory at the Florida Department of Environmental Protection.

The national stranding training workshop in 1998 was held in Sausalito, California from September 10-12 and was hosted by the Marine Mammal Center. The workshop was entitled “Stranding Response and Investigations: Sampling and Forensics”. Workshop participants from all regions heard presentations from expert marine mammal veterinarians, pathologists, forensic scientists, chemists, biologists, and stranding network personnel. Topics included descriptive pathology, investigation of gunshot wounds and fishery interactions, satellite tagging for post-release monitoring, and others. Hands-on demonstrations included live pinniped handling and medical care provided by the members of the Marine Mammal Center staff. Participants also participated in necropsies on cetaceans and pinnipeds.

Unusual Mortality Events

In response to the deaths of hundreds of bottlenose dolphins on the East Coast of the United States in 1987-1988, Congress added Title IV to the MMPA. Title IV included a number of provisions for dealing with unusual marine mammal mortality events. It called for the establishment of three main components: the Working Group on Unusual Marine Mammal Mortality Events, a contingency plan for such events, a fund to support the response of such events (contingency fund), and a data management system.

Section 304 of the MMHSRA directed NMFS to establish a Working Group on Unusual Marine Mammal Mortality Events, which was formalized in 1992. This group consists of individuals from a range of scientific disciplines, including veterinary medicine, pathology, epidemiology, toxicology, and marine mammal science, who are appointed to the Working Group for three-year terms. The NMFS Office of Protected Resources consults the Working Group when an unusual mortality event is suspected. The Working Group then determines whether such an event is actually occurring and provides

advice on specific actions that should be taken to respond to an event, as well as determine when the event is over. The NMFS Office of Protected Resources coordinates the response to and analysis of the event based on guidance from the Working Group.

The Working Group was consulted during 1998, with one event being deemed an unusual mortality event. Between May 15 and June 19, 1998 more than 70 California sea lions *(Zalophus californianus)* and one Northern fur seal *(Callorhinus ursinus)* stranded on the central California coastline in physical distress. All the animals were in good body condition and displayed similar clinical signs that were predominantly neurological. The animals had severe seizures that either became increasingly frequent resulting in opisthotonus (type of seizure that results in extreme muscle stiffness) then death or became less frequent, the animals showing ataxia and decreased responsiveness to stimuli between seizures and eventually becoming clinically normal. Forty-eight of the 70 animals (67%) died despite treatment. Of the 70 animals, 54 were adult females, 50% of which were pregnant at the time of stranding. The staff and volunteers of the Marine Mammal Center in Sausalito, California responded to the majority of these animals, transporting them to their rehabilitation facility for emergency care. Over the months of May and June 1998, a 3.5 fold increase in numbers of dead beach-cast birds and mammals was detected around Monterey Bay during routine surveys. State, local, and federal agencies (National Ocean Service and NMFS) worked together to understand the cause or origin of this event.

Coincidental to the stranding event, a bloom of *Pseudoniztia australis* (a marine algae that can produce a harmful toxin) occurred in Monterey Bay, reaching its peak on or about May 22, 1998. Histopathological lesions (neuronal necrosis) noted in the stranded sea lions were most severe in the hippocampus and dentate gyri regions of the brain and were typical of lesions caused by domoic acid toxicity in animal models. Analyses of gut contents, serum, urine and kidneys of the affected sea lions showed the presence of domoic acid, which can be produced by blooms of *Pseudoniztia australis*. The combination of clinical signs, histopathological, toxicological, epidemiological and oceanographic changes led the investigative team to diagnose domoic acid toxicity in these sea lions. This event was the first documented case of domoic acid toxicity in marine mammals.

The Working Group held their annual meeting in April 1998, in which they reviewed several issues which had arisen over the last year: the impacts of El Niño on marine mammal mortality, recent die-off investigations, and updates on the Marine Mammal Health and Stranding Response Program.

Contaminants and Biomonitoring Program

The contaminants and biomonitoring program began in 1991 with pilot projects in the Northeast and Southeast. It has expanded since that time to include sampling in all regions of the United States.

The Biomonitoring Program consists of:

1) real-time or retrospective evaluation for contaminants, disease, and health;
2) method development and validation;
3) research;
4) specimen archival; and
5) quality assurance.

The main goals of the biomonitoring component are to provide baseline information on contaminant levels, incidence and types of disease, human-related impacts on populations, and baselines on the health of populations of marine mammals.

Marine Mammal Pathology

In 1998, NMFS and the Armed Forces Institute of Pathology (AFIP) initiated a five-year interagency agreement to provide pathological services for the stranding network, unusual mortality investigations and disease investigations. AFIP personnel continue to participate on the Working Group of Marine Mammal Unusual Mortality Events. During the calendar year 1998, the Department of Veterinary Pathology at the Armed Forces Institute of Pathology issued diagnostic reports of 246 marine mammals consisting of 133 cetaceans, 102 seals

Table 1. Species represented in diagnostic pathology reports in 1998

Number	Species
54	*Balaena mysticetus*
30	*Tursiops truncatus*
12	*Kogia breviceps*
6	*Delphinus delphis*
5	*Stenella coeruleoalba*
5	*Eschrichtius robustus*
4	*Grampus griseus*
3	*Kogia simus*
4	*unidentified*
2	*Mesoplodon europaeus*
2	*Globicephala macrorhynchus*
2	*Globicephala melaena*
1	*Orcinus orca*
1	*Balaenoptera physalus*
1	*Phocoena phocoena*
1	*Megaptera novaeangliae*
1	*Delphinapterus leucas*
56	*Zalophus californianus*
26	*Phoca vitulina*
13	*Cystophora cristata*
4	*Phoca groenlandica*
1	*Erignathus barbatus*
1	*Monachus schauinslandi*
1	*Mirounga angustriostris*
10	*Odobenus rosmarus divergens*
1	*Enhydra lutris*

or sea lions, ten walruses, and one sea otter. The species represented can be found in Table 1.

AFIP personnel participated in the Marine Mammal Commission Workshop on Marine Mammals and Persistent Ocean Contaminants in Keystone, Colorado. AFIP personnel also produced eight presentations at national and international meetings, two publications for peer reviewed journals, and ten abstracts at national or international meetings. In addition to the pathology collaboration with AFIP, NMFS and stranding network participants also collaborated with pathologists at the University of Miami, University of California-Davis, Colorado State University, and the Alaska Veterinary Pathology Service.

Disease

NMFS has continued the working relationship with the National Veterinary Services Laboratory, U.S. Department of Agriculture through the Interagency Agreement signed in 1997. Disease studies included continued evaluation of *Brucella* in marine mammals and retrospective studies in Hawaiian monk seals and Northern fur seals. Results will be available from these studies in 1999.

Contaminants

The contaminants component of the MMHSRP includes biomonitoring, archiving, and quality assurance. The Environmental Conservation Division (ECD) of the Northwest Fisheries Science Center serves as the NMFS lead for the quality assurance and biomonitoring components of the MMHSRP.

In 1998, approximately 420 tissue samples from various matrices (*e.g.*, blood, blubber, liver, lung, milk, kidney) of the following species were analyzed for lipids, chlorinated hydrocarbons or essential and non-essential elements: bottlenose dolphin (*Tursiops truncatus*), California sea lion (*Zalophus californianus*), gray whale (*Eschrichtius robustus*), Hawaiian monk seal (*Monachus schauinslandi*), killer whale (*Orcinus orca*), northern fur seal (*Callorhinus ursinus*), polar bear (*Ursus maritimus*), ringed seal (*Phoca hispida*), rough-toothed dolphin (*Steno Bredanensis*), short-beaked common dolphin (*Delphinus delphis*), Steller sea lion (*Eumetopias jubatus*) and walrus (*Odobenus rosmarus*).

These samples were collected for several projects:

1)ongoing monitoring of contaminants in samples collected during subsistence harvests (*e.g.*, bowhead whale, beluga whale);

2)analyses of tissues from cetacean and pinniped species that are highly endangered and for which there are limited data (*e. g.*, Hawaiian monk seal, killer whale);

3)collection of tissues for the Specimen Bank project (*e.g.*, ringed seal, polar bear, grey seal, beluga whale, walrus);

4)developing or improving current analytical techniques that elucidate the types and levels of contaminants ma-

rine mammals may be exposed to and how they may affect the health of these animals; and

5) a continuing study on northern fur seal in which immune functions and other health parameters will be assessed in relationship to chlorinated hydrocarbon exposure.

Selected activities and accomplishments are summarized below.

Northern Fur Seal. Two collaborative studies were conducted because of concern over the health of northern fur seals (*Callorhinus ursinus*) from the Pribilof Islands, Alaska. The St. Paul Island fur seal population stabilized in the early 1980s, whereas the number of fur seals on St. George Island continued to decline until the mid-1990s. One potential factor for these population trends is that certain toxic contaminants are at levels that may indirectly affect the health of fur seals. The first study, a continuing collaboration with the University of Alaska Fairbanks (UAF), was designed to help determine if there is a relationship between contaminant exposure and immune or health dysfunctions in fur seal pups. In 1998, as part of a continuing study on northern fur seals, approximately 50 blood, blubber and liver samples of fur seals were collected by personnel from UAF and National Marine Mammal Laboratory (NMML) with assistance from Aleut residents and analyzed by the NWFSC for toxic chemical contaminants. The (chlorinated hydrocarbon) CH data were compared to various immune functions and health parameters measured in the fur seals. In addition, ten whole body samples of northern fur seal prey species (*e.g.*, walleye pollock, squid) were collected in 1998 and analyzed for CH concentrations and profiles to determine the transfer of these contaminants from fur seal prey to fur seal mother to her fetus and then to milk and pup until weaning. Preliminary data have shown that the blood of fur seal pups had higher contaminant levels compared to the concentrations in the blood of the dams. In addition, the CH levels measured in the pups of young dams were higher than those measured in the pups of old dams. Furthermore, fur seal pups that contained higher CH levels had lower retinol and thyroxine levels as well as poorer cellular immune responses compared to pups with lower contaminant concentrations.

In a second northern fur seal study, in collaboration with NMML, 80 archived blubber samples of subadult males and juveniles and milk samples of northern fur seals from St. George Island and St. Paul Island, AK were analyzed for CHs by staff at the NWFSC. Preliminary results suggest that the CH concentrations measured in tissues of fur seals from St. George Island were higher or comparable to those found in animals from St. Paul Island. This northern fur seal CH data will be further analyzed in 1999 to determine if the contaminant levels measured in the fur seals are sufficient to negatively impact the seals.

Hawaiian Monk Seal. The Hawaiian monk seal (*Monachus schauinslandi*) was listed as an endangered species in 1976. A recovery plan was implemented in which yearling seals were moved to Midway Atoll from various locations of Hawaii. Approximately 65 blood and blubber samples of Hawaiian monk seals from three sites (Midway Atoll, Pearl and Hermes Reef and French Frigate Shoals) were acquired by the Southwest Fisheries Science Center-Honolulu Laboratory, and were analyzed for selected chlorinated hydrocarbons (CHs), including polychlorinated biphenyls (PCBs) and DDTs. Several PCBs, including moderately chlorinated non-dioxin-like PCBs and certain dioxin-like congeners, were measured in the monk seal tissue samples. However, the CH concentrations in the monk seal tissues were relatively low compared to the levels measured in other pinnipeds from the eastern Pacific (*e.g.*, Alaska, California, Washington). Preliminary statistical analyses (ANOVA) of the CH data from the monk seals indicated that there may be significant differences in total PCB concentrations (based on wet weight) among collection sites, with Midway Atoll seals having higher CH concentrations than the animals from the other two sites. Although these preliminary data suggest that levels of certain organic contaminants are not elevated compared to other pinniped species, the highly endangered status of the Hawaiian monk seal supports caution in evaluation of the level of risk posed by toxic anthropogenic chemicals from this limited data set. Moreover, these analyses focused only on CHs and exposure to other contaminants, such as toxic metals, may be occurring. Future analyses should also include considerations of additional contaminants.

Internet Database. An internal database that had been used for tracking the status of samples received and for reporting chemical concentration data in those samples was modified to enable a subset of the data to be made available over the World Wide Web. This involved designing a web site which would enable users to search the database by several criteria and to display the requested information in a variety of formats, allowing users to organize and print selected data in a format of their choice. The new features of this version of FileMaker were fully utilized, including the provided web server plugin, and the dynamic markup language for providing custom interaction with the database through web pages. This language allows a degree of flexibility in what we can present to anyone wishing to use this database as a resource. The database will contain all currently published data with references (currently, there are more than 200 samples from over 80 animals), and be part of a site that contains information on our methodology, a guestbook to track user interests, and links to other marine mammal resources on the Web. As more data are published, these data (with references provided for the purpose of interpretation) will be added to the database, so that this searchable database of contaminants in marine mammals continues to grow in usefulness to other researchers. Portions of the web site will become publicly accessible in 1999.

National Marine Mammal Tissue Bank

The National Marine Mammal Tissue Bank (NMMTB) was established in 1989 and was formalized in 1992, with the amendments to the MMPA. Marine mammal species that are representative of a specific geographic area or trophic level have been selected in each region of the United States to serve as indicators of the overall health of the marine mammal populations and ecosystems in that area. For the NMMTB, specimens are archived from these representative species, animals involved in unusual mortality events, from stranded marine mammals, animals in capture/release programs, those taken in subsistence hunts, or those killed as a result of human interaction.

Since its inception, NMFS has continued a strong relationship with the National Institute of Standards and Technology (NIST) to support the NMMTB and the contaminants Quality Assurance project. 1998 represented the second year of a five-year interagency agreement in support of the National Marine Analytical Quality Assurance Program, which was established in 1995. As part of this agreement, NIST has established a satellite specimen bank for marine specimens, analytical laboratories, and a Standard Reference Material (SRM) production facility in Charleston, South Carolina. The NMMTB and the Marine Mammal Quality Assurance Project are both included in this agreement. Specimens are collected from Alaska with support and collaboration of the United States Geological Survey/Biological Research Division (USGS/BRD) and Mineral Management Service through the Alaska Marine Mammal Tissue Archival Project (AMMTAP), a component of the NMMTB.

Since its beginning, specimens of blubber, liver, and kidney have been routinely collected for the NMMTB. These tissues are collected and archived using standard protocols specifically designed by the program to ensure sample quality and to maintain sample integrity during long-term storage. As of December 31, 1998, the inventory of marine mammal specimens in the NMMTB collected by both the AMMTAP and the Marine Mammal Health and Stranding Response Program included 1,181 specimens collected from 425 animals representing 28 species. During 1998, 315 specimens were collected from 105. Also in 1998, a procedure was started in which detailed descriptions of field collections made by NIST personnel were produced in NIST Reports of Analysis. Of the 1,181 marine mammal tissue specimens archived in the NMMTB, 434 were collected by the MMHSRP from 148 animals outside of Alaska. These included tissue specimens from 103 individuals representing twelve species of cetaceans and 45 individuals representing six species of pinnipeds. There are 747 marine mammal tissue specimens archived in the NMMTB collected by the AMMTAP from 277 animals in Alaska. These include tissue specimens from 135 individuals representing eight species of pinnipeds including walrus, 104 individuals representing three species of cetaceans and 38 individuals representing two species of fissipeds (polar bears and sea otters).

Protocol Development

During the reporting period, the collection of sea otter *(Enhydra lutris)* tissues began in Southeast Alaska at Sitka. Because of the usual lack of storage fat in these animals, only liver and kidney tissues are currently being banked from these animals. Through coordination with the sea otter researchers from the U.S. Fish and Wildlife Service, Marine Mammals Management Office, and the U.S. Geological Survey- Biological Resources Division, a draft sea otter protocol was written and is currently under review by the NMMTB interagency team. This protocol will be finalized in 1999.

Protocol Training

Two specimen collection and banking protocol training sessions were held during the reporting period for regional stranding network participants. These included training at the Southeast Regional Stranding Workshop on March 12-13, 1998 at St Petersburg, Florida and the Northeast Regional Stranding Workshop on March 27-29, 1998 in Virginia Beach, Virginia.

Quality Assurance Program

The Quality Assurance (QA) program was initiated in 1992 in response to the legislative mandate to improve the quality of chemical contaminant data for marine mammals and has proceeded as a collaborative effort between NIST and NMFS. This program principally involves two approaches: the development of control or standard reference materials using marine mammal matrices (tissue and fluids) and interlaboratory comparisons. Control material and standard reference materials are developed on an as-needed basis. At least annual interlaboratory comparisons are performed with external labs for both organic and inorganic analyses.

Preparation and Analysis of Control Materials

A second liver homogenate control material (Whale Liver Homogenate II) is being developed from liver tissue collected from beluga whales taken in Alaska native subsistence hunts in 1996. Cryogenic homogenization and preparation of this material began in 1997. Aliquots of this material were provided to NIST Gaithersburg, the Northwest Fisheries Science Center, Environmental Conservation Division (NWFSC/ECD) and the Department of Veterinary Anatomy and Public Health at Texas A&M University. Initially, this new beluga whale liver control material was being considered as a candidate for the development of a marine mammal liver SRM; however it will probably not be developed into an SRM, but will continue to be used as a quality control material.

Mercury concentrations on aliquots of Whale Liver Homogenate II have been determined at NIST through use of Instrumental Neutron Activation Analysis and are reported in Report of Analyses 839.05-99-004. Trace element concentrations from the individual laboratories on Whale Liver Homogenate II will be reported in 1999.

Interlaboratory Comparison Exercises

During 1998, an interlaboratory comparison exercise on trace elements in beluga whale liver sample splits was initiated between NIST, NWFSC/ECD, and the Department of Veterinary Anatomy and Public Health at Texas A&M University. The results have been requested from each laboratory and a comparison of results will be provided in 1999. Previous results from exercises on inorganic analysis of marine mammal liver tissue conducted by NIST and NWFSC/ECD were reviewed and summarized in Report of Analysis 839.05-97-003. Elements examined were silver, arsenic, cadmium, copper, iron, mercury, manganese, selenium, vanadium, and zinc. Materials compared included a pilot whale liver, bovine liver, and liver samples from harbor porpoises, beluga whales, bowhead whales, white-sided dolphins, and ringed seals.

Also during 1998, analytical results from an intercomparison of analyses of Cook Inlet beluga whale blubber tissues for PCBs and chlorinated pesticides were received from the NIST Gaithersburg laboratory, the NWFSC/ECD, and Freshwater Institute, Department of Fisheries and Oceans, Canada. These results are being compared and will be reported in 1999.

Development of Standard Reference Material (SRMs)

The experience gained from the preparation and analysis of the pilot whale blubber control material was used to develop SRM 1945 Organics in Whale Blubber, a certi-

fied material that can be used for validating measurements of organic contaminant in marine mammal blubber. Concentrations for 27 PCB congeners and 15 chlorinated pesticide have been certified for this SRM and non-certified values for two additional PCB congeners (PCB 28 and 31) and chlorinated pesticides (dieldrin and B-HCH) are also available. The analytical data for the certification of PCBs and chlorinated pesticides in SRM 1945 are provided. The low relative uncertainties associated with the majority of analyte concentrations (5-10%) and the extensive list of certified analytes makes SRM 1945 a valuable resource for validating analytical methods for the determination of PCB congeners and chlorinated pesticides in marine mammal blubber and other high lipid-containing materials.

Requests for Samples

Requests for samples were received from two researchers outside of either the MMHSRP or the AMMTAP. Blubber samples of potential polar prey were requested by a researcher at the Denver Zoological Gardens, who is conducting a study of vitamin D3 deficiencies in polar bears. The resulting data and a copy of the poster on the results were presented at the 5th Symposium on the Biological Effects of Light in November 1998 in Switzerland. Samples of liver from three bowhead whales were also provided to the Center for Coastal Environmental Health and Bimolecular Research at Charleston.

Twelve presentations, two posters, one formal agency report, three contributions to formal agency reports, and one peer-reviewed publication were produced by NIST staff during 1998.

Chapter XI. Public Education and Outreach Programs

photo by: Michael Payne, NMFS

As a part of implementing its programs and policies, the National Marine Fisheries Service (NMFS) supports numerous public outreach and education efforts through its headquarters office as well as in each of its regions. Some of these outreach efforts are solely NMFS coordinated, but the vast majority of these projects have been undertaken as a part of collaborative efforts between NMFS, other governmental agencies, and/or non-governmental groups to promote common goals and/or policies.

NMFS and its programs affect a variety of people from fishers, to managers, to conservationists, to policy-makers. Public outreach is critical to convey NMFS' messages and announce new programs as well as changes in existing ones. Outreach programs allow the public access to information about federal policies and initiatives in their area of interest. Some of these efforts directly address particular programs, and descriptions of these outreach initiatives can be found in their respective sections of this report.

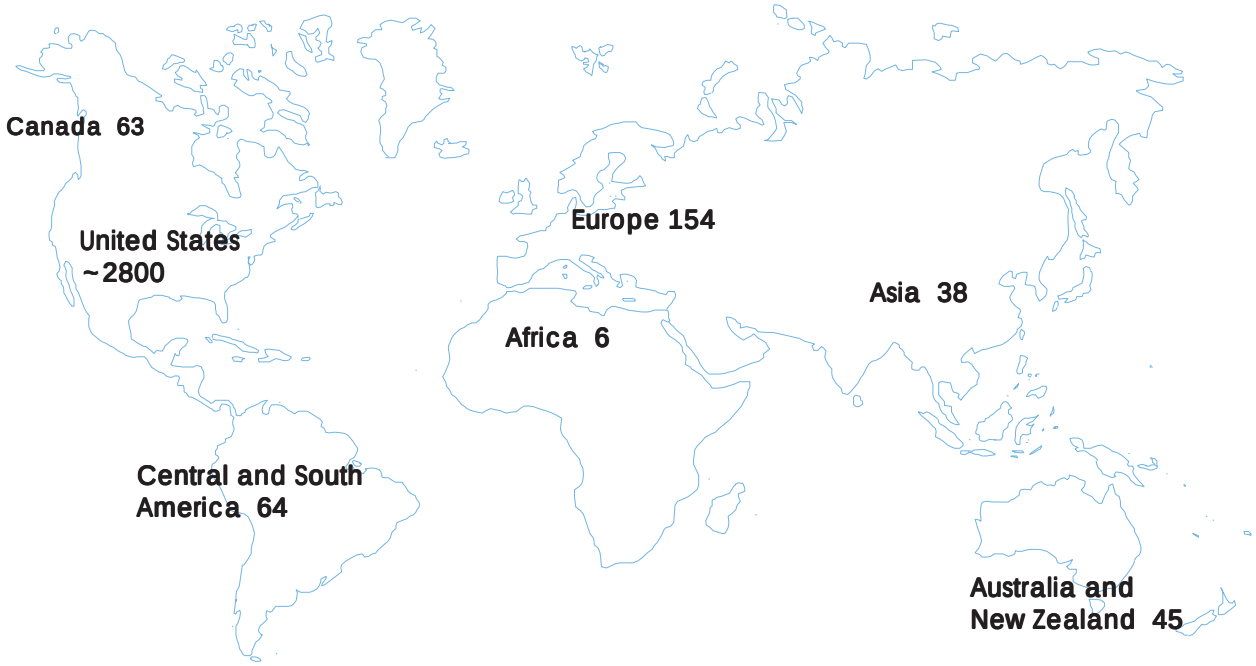
National Efforts

MMPA Bulletin

To provide the public with concise, up-to-date information on its programs, NMFS' publishes the *MMPA Bulletin*. The *Bulletin* is a quarterly publication of the Office of Protected Resources designed to increase public awareness of and participation in MMPA legislative, regulatory, and implementation processes. The first edition, published in September 1994, included a description of the MMPA Amendments of 1994, and subsequent editions have focused on NMFS' efforts to implement the Amendments and other aspects of the MMPA. The *MMPA Bulletin's* readership consists of commercial fishers as well as members of the environmental and marine mammal science communities, state and federal agencies dealing with protected species issues, Alaska Native organizations, public display facilities, and Congress.

The *MMPA Bulletin's* readership has increased from approximately 1,800 in 1996, to 2,400 in 1997, and to over 3,000 in 1998. This increase can be partially attributed to an overall increased interest in marine mammal

Figure 1. *MMPA Bulletin* Readership Worldwide



conservation issues from the general public. NMFS has also worked to increase the *MMPA Bulletin's* readership through posting announcements about the availability of the *MMPA Bulletin* on key internet listservers, such as "MARMAM" and "WILDLIFE HEALTH" as well as on the Office of Protected Resources web site at:

www.nmfs.gov/prot_res/mammals/bulletin.html

Although the vast majority of the readership is in the United States, international interest in the *Bulletin* has recently increased. Individuals from 56 countries around the world receive the *MMPA Bulletin*, with Canada, the United Kingdom, Australia, Brazil, and Germany having the most recipients.

Posters to Remind Fishers to Report Incidental Injuries and Mortalities

The MMPA Amendments of 1994 required all commercial fishers to report any incidental injuries or mortalities of marine mammals to NMFS within 48 hours of returning to port; however, daily logbooks of fishing activity are no longer required (see Chapter III. Reducing Interactions Between Marine Mammals and Commercial Fisheries). To remind fishermen of their reporting responsibilities under the MMPA, the NMFS Office of Protected Resources, the Center for Marine Conservation, and the Norcross Wildlife Association developed a poster for display at fishing ports and marinas in 1997.

The poster depicts a fishing vessel at sea, with the caption:

"Before you head home.... remember to fill out a marine mammal reporting form."

There are two versions of the poster, one depicting a typical East Coast fishing vessel, and one depicting a typical West Coast vessel. The distribution of the posters continued in 1998. NMFS Office of Protected Resources plans to work with the U.S. Coast Guard and the NMFS Office of Enforcement to distribute these posters in 1999.

NOAA Join the "National Watchable Wildlife Program"

The National Watchable Wildlife Program (NWWP) is a unique partnership between federal, state and environmental groups that have been promoting safe and re-

sponsible wildlife viewing guidelines for the past ten years. Organizations that have signed the NWWP Memorandum of Understanding include the U.S. Fish and Wildlife Service, the U.S. Forest Service, the National Park Service, Audubon Society, Defenders of Wildlife, National Wildlife Federation, and other wildlife interest groups. The NWWP produces various public education and outreach materials to teach people how to responsibly and respectfully view wildlife, including an informative state guidebook series that highlights places to view wildlife while educating the public as to why it is harmful to closely approach, disturb, and feed wild animals.

The NWWP has developed guidelines on how to view wildlife to help protect the safety and well-being of both wild animals and people, such as: viewing wildlife from a safe distance and using binoculars for a "close look"; staying clear of nests, dens and rookeries; and never touching or feeding wild animals. To date, over twenty state guidebooks have been completed and several more are in production. In addition, the Center for Wildlife Information (CWI) in Missoula, Montana works closely with NWWP member organizations who are CWI "Partners in Wildlife Stewardship." CWI produces complimentary education and outreach materials such as the "Wildlife Stewardship" brochure and poster series that provides information on how to safely view and photograph wildlife.

Although the NWWP has historically focused on terrestrial species of wildlife, the NWWP's viewing etiquette and wildlife stewardship principles directly apply to marine species as well. In the summer of 1998, both NMFS and the National Ocean Service (NOS) were accepted by the NWWP as "Supporters" of the program. NMFS and NOS participation will help broaden the NWWP to focus efforts on marine species, and will be an opportunity to enhance NOAA's education and outreach efforts to guide the public on responsible wildlife viewing in the marine environment. The NWWP will complement NMFS' current efforts to address the persistent problems such as: (1) people closely approaching, feeding and disturbing marine mammals, sea turtles, sea birds and fish; and (2) engaging in harmful boating and diving/ snorkeling practices that damage coral reef, sea grass, and other marine resources.

In October 1998, NMFS and NOS delivered a joint presentation at the 1998 NWWP conference in Albuquerque, New Mexico that explained the need to apply the NWWP viewing guidelines and stewardship principles to marine species, and ways to meet that objective. NMFS and NOS also participated in the conference's Wildlife Expo by displaying an exhibit booth and handing out education and outreach materials about marine mammals, endangered marine species and NOAA's diverse programs. Several of NOS' National Estuarine Research Reserves sites have already been working with the NWWP for several years. The participation of NMFS and NOS with the NWWP (collaboratively on behalf of NOAA), will help ensure that the wildlife stewardship principles are incorporated throughout the various elements of NOAA. NMFS and NOS have already contributed to the upcoming NWWP guidebook for the Virgin Islands and Puerto Rico, and the NOS National Marine Sanctuaries has developed a "Sea Smart-See Smart" campaign consistent with the NWWP. Plans are currently underway for an overview guidebook focusing on how to safely and responsibly view all species of marine wildlife from whales to corals and a guidebook for the state of Hawaii. The 1999 annual NWWP conference will be held in Ft. Myers, Florida, which will provide an opportunity for NMFS and NOS to highlight marine species and habitats.

"Protect Dolphins" Campaign Continues to Combat Feeding and Harassment of Wild Dolphins

Feeding marine mammals in the wild alters their behavior in ways that put them at increased risk of injury and death, and may impact their ability or willingness to forage for food. NMFS' prohibition on feeding was upheld in 1993 by the U.S. Fifth Circuit Court of Appeals, and is widely supported by the scientific research and environmental communities since provisioning of any species of wildlife is known to be harmful. NMFS is also concerned that "Swim-with-Dolphin" activities risk harassing the animals because they seek out and interact with dolphins in a manner that has the potential to disturb the animals' behavioral patterns. In the Southeast United States, many of these programs are directly facilitated by illegal dolphin feeding.

Throughout 1998, NMFS continued to promote the "Protect Dolphins" campaign to educate the public that feeding and harassing wild dolphins is harmful and illegal under the MMPA (see 1997 MMPA Annual Report). Public awareness is a key factor in effectively addressing the problem since most people who engage in the activities do not realize that they are placing the dolphins and themselves at risk. NMFS continued to work with researchers, public display facilities, and environmental groups to foster a "wildlife stewardship etiquette" and to make the distinction between passive observation and interaction. NMFS encourages passive observation from a safe distance of at least 50 yards (45 m) with binoculars or a telephoto lens as the best way to observe wild dolphins.

In January 1998, NMFS issued a press release as a reminder that it is still against federal law to feed and harass wild dolphins. The reminder was in response to press coverage about a Florida state court ruling on Florida's wildlife law regarding feeding that caused confusion regarding jurisdictional authority over marine mammals. The press release clarified that feeding and harassment are illegal under federal law. However, dolphin feeding and harassment continues to be a serious concern throughout the Southeast United States, in particular Florida, Texas, and South Carolina. The flurry of feeding activity concerns NMFS officials because the average citizen is unaware that offering a dolphin a handout is harmful to the dolphins, dangerous to people, and illegal under the MMPA.

During 1998, outreach and education efforts included:
* reprinting (in collaboration with the National Aquarium in Baltimore) and distributing the brochure entitled "Protect Dolphins – Admire Them From a Distance," which explains why feeding and harassment of wild dolphins is harmful and illegal, and that the best way to view wild dolphins is to passively observe them from a distance of 50 yards (45 m) while using binoculars or telephoto lenses;

* reprinting and distributing a revised metal warning sign for posting in marinas and waterways;

* conducting awareness campaigns by the NMFS Office of Enforcement's "Protected Resources Enforcement Team" and Office of Protected Resources during the Memorial Day, July 4th, and Labor Day weekends in Panama City, Florida (where dolphin feeding and harassment have been a persistent problem); and

* conducting several media interviews with national and local news organizations.

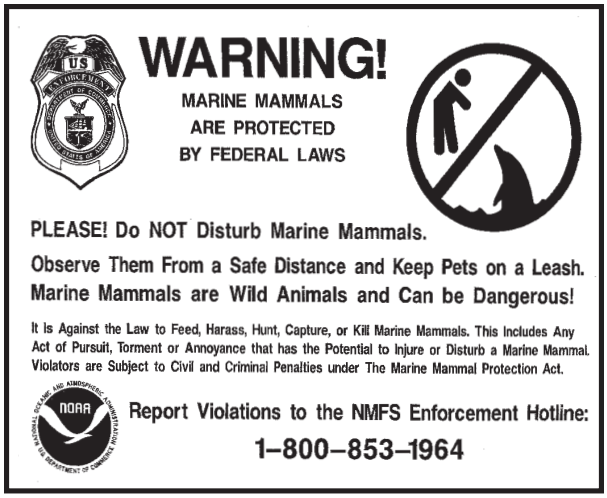
In addition, NMFS worked with the Marine Mammal Commission to conduct a pilot study with researchers from the Woods Hole Oceanographic Institution, Chicago Zoological Society and Duke University Marine Laboratory to evaluate the scope and effects of the public's feeding and interacting with wild dolphins in Florida. The NMFS Office of Protected Resources also supported a NOAA Sea Grant graduate student from the Duke University Marine Lab whose masters' thesis focused on human/wild dolphin interactions in Florida. The data collected from both research projects are still being analyzed, and reports are expected in 1999. The Southeast Fisheries Science Center conducts research to document the status of bottlenose dolphin populations in the Florida panhandle, the area where feeding of wild dolphins is known to be a significant problem.

Regional Efforts

Northeast Region

Outreach activities are integral to all components of the Atlantic Large Whale Take Reduction Plan. In 1998, NMFS continued to work with the Sea Grant offices at the University of Maine and University of Rhode Island to conduct an outreach program in the New England and Mid-Atlantic areas. Sea Grant organized several meetings, workshops, and seminars at key fishermen's forums held in spring 1998.

These outreach efforts will provide the results of gear research to fishermen and serve as a conduit for suggestions from fishermen to the Gear Advisory Group and directly to gear researchers. NMFS will continue to support the Maine Plan Coordinator and will work with Massachusetts and Rhode Island to develop similar dockside outreach efforts in their areas.



NMFS also expanded the Large Whale Disentanglement Network to provide full-time coverage for the entire Gulf of Maine and made significant efforts in Maine in the spring of 1998 to educate fishermen about proper reporting, and operational procedures regarding entangled whales. NMFS anticipates that the fishers training workshops conducted will be good templates for similar training in the Southeast United States and other key areas along the East Coast.

Southeast Region

The Protected Resources Division in the Southeast region is cooperating with Eckerd College by providing space for an unpaid intern who is conducting research on bottlenose dolphin *(Tursiops truncatus)* interactions in proximity to commercial and recreational boating facilities. The research is related to bottlenose dolphin education and outreach, and the student will assist the Division by conducting education and outreach activities with a special emphasis on educating the public as to laws and regulations governing human interactions (*e.g.*, swimming and feeding) with dolphins.

The NMFS Southeast Region Protected Resources Division is also developing a Memorandum of Agreement (MOA) with the Harbor Branch Foundation, a nonprofit marine conservation and research facility in Ft. Pierce, Florida, to develop and conduct a program for the conservation of wild dolphins in Florida. Harbor Branch will receive state funds from the proceeds generated by a special vehicle license plate with a "Protect Wild Dolphins" theme. Harbor Branch is setting up a competitive grant program to allocate proceeds from the licence plate sales to fund research and management programs for bottlenose dolphins on an annual basis. Funds obtained through this competitive process could be used to support the MOA with NMFS.

Southwest Region

Hawaiian monk seals *(Monachus schauinslandi)* resting on Kauai's beaches are often disturbed by beach goers. Recently, the Hawaii Department of Land & Natural Resources' Division of Aquatic Resources established the Kauai Monk Seal Watch Program, a partnership of government agencies, including NMFS and the County of Kauai, and the public to respond to all reports of seals hauled out along Kauai's shoreline. Augmented with community volunteers, MSWP's mission is to sustain and enhance the Hawaiian monk seal and its habitat by instituting a management and monitoring program that encourages community participation and promotes environmental education and cultural awareness. In 1998, NMFS Honolulu Laboratory's Marine Mammal Research Program has continued its active involvement in the MSWP.

The MSWP government-volunteer network seeks to promote education and appreciation of monk seals by providing on-site information when Hawaiian monk seals are hauled up on Kauai's beaches. MSWP volunteers protect the animals by keeping visitors at appropriate distances, fencing off mothers with pups, and posting signs and information flyers in the vicinity of the animals. Volunteers also record seal-human interaction and seal behavior, as well as annotate "scar cards" used for seal identification to be incorporated into the NMFS monk seal database. In the spirit of ethical wildlife watching principles, the MSWP promotes public education and outreach, safe viewing practices, and supports the collection of information to assist in research and management.

Alaska Region

The Alaska Region continued its public outreach campaign to increase awareness of the Marine Mammal Viewing Guidelines. The Alaska Region published brochures and laminated posters describing the recommendations

for responsible marine mammal viewing. This printed material was distributed widely to wildlife viewing operators and associations, other marine operators, the public, and in harbors and ports. The Region also conducted public meetings to present and discuss this information to interested groups. Outreach material from Protected Resources- Alaska Region was also distributed in other public arenas, at fishing industry conventions and in an educational display at the University of Alaska Southeast. Staff in the Protected Resources Division also gave presentations on marine mammals to local school classes and to the Forest Service resource personnel who work on the Alaska Marine Highway System. Staff also supervised a student intern conducting a marine mammal stranding project in the Alaska Region.

Northwest Region

The Northwest Region (NWR) expanded its outreach program in 1998 by revising its web page to include marine mammal information that responded to the most commonly asked questions by the public in areas such as expanding pinniped populations, the Report to Congress on West Coast Pinnipeds, and Makah Tribe whaling. The NWR web site can be found at:

www.nwr.noaa.gov

The NWR also conducted workshops to familiarize State and local officials with the ecology of regional marine mammals and the provisions of the MMPA. Workshops were held for authorities on the Olympic Peninsula, Washington and on the central Oregon Coast. The workshops included a review of the marine mammals commonly encountered in the Pacific Northwest, presentations on marine mammal life history and identification, handling protocols for stranded marine mammals, and a summary of the marine mammal regulations. The NWR also continues to issue seasonal notices to the public on the occurrence of harbor seal pupping during the spring and summer months. These news releases remind the public that seals need to use shoreline habitat during pupping and that live animals found on beaches are to be left undisturbed.

NMFS National Marine Mammal Laboratory

Staff from the National Marine Mammal Laboratory (NMML) participated in many public outreach activities in 1998. They gave presentations to 27 primary/secondary school classes, three university classes, and seven community groups on various topics, including marine mammal biology and ecology; marine mammals of the Northwest United States; aerial, vessel, and land-based survey methods and results; NMML research programs; and career opportunities in marine mammal science. They also participated in eight Family Science Nights at local elementary schools, three career days at local high schools, and a career fair at the University of Washington's College of Ocean and Fishery Sciences; answered interview questions from students and members of the media; hosted 14 students and two teachers in job-shadow programs; conducted three hands-on workshops for junior high school girls; gave tours of the NMML labs, dermestid beetle colony, and skeletal collection to two school groups; supervised five volunteers and an intern who processed specimens and organized and cataloged data; mentored a high school student who completed a Senior Project on marine mammals; and trained two classes of ship-board observers to collect marine mammal sighting data for the Platforms of Opportunity Program.

Two marine mammal educational display boards (created by the Alaska Fisheries Science Center Diversity Panel) and a collection of marine mammal specimens were used in many of the outreach activities. The staff also distributed NMFS marine mammal and fish posters, NOAA Year of the Ocean posters and pamphlets, and the NMFS Science Teacher's Resource Guide to teachers, students, and community groups.

Appendix A. The 1999 List of Category I and II Fisheries

Estimated # of marine mammal species or stocks incidentally injured/killed vessels or persons

Atlantic Ocean, Gulf of Mexico, and Caribbean Fisheries

Category I

Atlantic Ocean, Caribbean, Gulf of Mexico large pelagics drift gillnet	15	North Atlantic right whale Sperm whale Cuvier's beaked whale True's beaked whale Blainville's beaked whale Long-finned pilot whale Atlantic white-sided dolphin Atlantic spotted dolphin Striped dolphin Bottlenose dolphin	Humpback whale Dwarf sperm whale Harbor porpoise Gervais' beaked whale Risso's dolphin Short-finned pilot whale Common dolphin Pantropical spotted dolphin Spinner dolphin
Northeast sink gillnet	341	North Atlantic right whale Minke whale Atlantic white-sided dolphin Bottlenose dolphin Harbor seal Common dolphin Spotted dolphin Harp seal	Humpback whale Killer whale Striped dolphin Harbor porpoise Gray seal Fin whale False killer whale
Atlantic Ocean, Caribbean, Gulf of Mexico large pelagics longline	361	Humpback whale Risso's dolphin Short-finned pilot whale Atlantic spotted dolphin Striped dolphin Harbor porpoise	Minke whale Long-finned pilot whale Common dolphin Pantropical spotted dolphin Bottlenose dolphin
Gulf of Maine, U.S. mid-Atlantic lobster trap/pot	13,000	North Atlantic right whale Fin whale Atlantic white-sided dolphin	Humpback whale Minke whale Harbor seal

Category II

U.S. mid-Atlantic coastal gillnet	>655	Humpback whale Minke whale	Bottlenose dolphin Harbor porpoise
Gulf of Maine small pelagics surface gillnet	133	Humpback whale Harbor seal	Atlantic white-sided dolphin
Southeastern U.S. Atlantic shark gillnet	12	Bottlenose dolphin	North Atlantic right whale
Atlantic squid, mackerel, butterfish trawl	620	Common dolphin Long-and short-finned pilot whales	Risso's dolphin Atlantic white-sided dolphin
Atlantic herring midwater trawl (including pair trawl)	17	none documented	
Mid-Atlantic haul seine	25	Bottlenose dolphin	Harbor porpoise
Gulf of Mexico menhaden purse seine	50	Bottlenose dolphin	
North Carolina roe mullet stop net	13	Bottlenose dolphin	

Appendix A (cont). The 1999 List of Category I and II Fisheries

Pacific Ocean Fisheries

Category I:				
CA angel shark/halibut and other species large mesh (>3.5in) set gillnet	58		Harbor porpoise California sea lion Northern elephant seal	Common dolphin Harbor seal Sea otter
CA/OR thresher shark/swordfish drift gillnet		130	Steller sea lion Dall's porpoise Risso's dolphin Common dolphin Short-finned pilot whale Mesoplodont beaked whales Pygmy sperm whale Northern elephant seal Minke whale Northern fur seal	Sperm whale Pacific white-sided dolphin Bottlenose dolphin Northern right whale dolphin Baird's beaked whale Cuvier's beaked whale California sea lion Humpback whale Striped dolphin Killer whale
Category II:				
AK Prince William Sound salmon drift gillnet	509		Steller sea lion Harbor seal Harbor porpoise	Northern fur seal Pacific white-sided dolphin Dall's porpoise
AK Peninsula/Aleutian Islands salmon drift gillnet	163		Northern fur seal Harbor porpoise	Harbor seal Dall's porpoise
AK Peninsula/Aleutian Islands salmon set gillnet	110		Steller sea lion	Harbor porpoise
Southeast Alaska salmon drift gillnet	439		Steller sea lion Pacific white-sided dolphin Dall's porpoise	Harbor seal Harbor porpoise Humpback whale
AK Cook Inlet salmon drift gillnet	560		Steller sea lion Harbor porpoise Beluga	Harbor seal Dall's porpoise
AK Cook Inlet salmon set gillnet	604		Steller sea lion Harbor porpoise Dall's porpoise	Harbor seal Beluga
AK Yakutat salmon set gillnet	139		Harbor seal	Gray whale
AK Kodiak salmon set gillnet	172		Harbor seal Sea otter	Harbor porpoise
AK Bristol Bay salmon drift gillnet	1,884		Steller sea lion Harbor seal Gray whale Pacific white-sided dolphin	Northern fur seal Beluga Spotted seal
AK Bristol Bay salmon set gillnet	941		Harbor seal Gray whale Spotted seal	Beluga Northern fur seal
AK Metlakatla/Annette Island salmon drift gillnet	60		None documented	
WA Puget Sound Region salmon drift gillnet (Treaty Indian fishing excluded)	900		Harbor porpoise Harbor seal	Dall's porpoise

Appendix A (cont). The 1999 List of Category I and II Fisheries

AK Southeast salmon purse seine	357	Humpback whale	
CA anchovy, mackerel, tuna purse seine	150	Bottlenose dolphin Harbor seal	California sea lion
CA squid purse seine	65	Short-finned pilot whale	
AK misc. finfish pair trawl	4	None documented	
OR swordfish floating longline	2	None documented	
OR blue shark floating longline	1	None documented	

Appendix B. Marine Mammal Authorization Program Mortality/Injury Reports for 1998

Species	Fisheries	Injured	Killed
Beaked whale	Atlantic Ocean, Caribbean, Gulf of Mexico large pelagics drift gillnet	0	9
False killer whale	Atlantic Ocean, Caribbean, Gulf of Mexico large pelagics longline	1	0
Gray whale	CA/OR thresher shark/swordfish drift gillnet	0	1
Minke whale	Atlantic Ocean, Caribbean, Gulf of Mexico large pelagics longline	1	0
	U.S. Mid-Atlantic coastal gillnet	0	1
Sperm whale			
	CA/OR thresher shark-swordfish drift gillnet	0	1
Pilot whale	Atlantic Ocean/Caribbean/Gulf of Mexico large pelagics drift gillnet	0	8
Atl. white-sided dolphin	Atlantic Ocean/Caribbean/Gulf of Mexico large pelagics drift gillnet	0	12
Bottlenose dolphin	Atlantic Ocean, Caribbean, Gulf of Mexico large pelagics drift gillnet	0	1
	U.S. Mid-Atlantic coastal gillnet	0	1
	Gulf of Mexico menhaden purse seine	0	1
Common dolphin	CA/OR thresher shark/swordfish drift gillnet	2	5
	Atlantic Ocean/Caribbean/Gulf of Mexico large pelagics drift gillnet	1	165
	CA angel shark/ halibut and other species large mesh set gillnet	0	2
	Atlantic squid, mackerel, butterfish trawl	0	12
Risso's dolphin	Atlantic Ocean/Caribbean/Gulf of Mexico large pelagics drift gillnet	0	7
	Atlantic Ocean/Caribbean/Gulf of Mexico large pelagics longline	1	0
Striped dolphin	Atlantic Ocean/Caribbean/Gulf of Mexico large pelagics drift gillnet	0	1
Harbor porpoise	AK Southeast salmon drift gillnet	1	0

Appendix B. (cont). Marine Mammal Authorization Program Mortality/ Injury Reports for 1998

Species	Fisheries	Injured	Killed
	Northeast sink gillnet	2	2
Dall's porpoise	WA/OR/CA groundfish trawl	2	0
Humpback whale	AK Southeast salmon drift gillnet	0	0
Unid. small cetacean	AK Kodiak salmon set gillnet	1	0
California sea lion	CA/OR thresher shark/swordfish drift gillnet	3	16
	CA angel shark/halibut/other species large mesh set gillnet	0	2
	WA/OR salmon net pen	4	12
Steller sea lion	WA/OR/CA groundfish trawl	1	3
	CA/OR thresher shark/swordfish drift gillnet	0	1
Harbor seal	New England multispecies sink gillnet	3	8
	WA/OR salmon net pens	3	5
	U.S. Mid-Atlantic coastal gillnet	0	1
	WA/OR/CA groundfish trawl	0	1

Appendix C. Estimates of Total Incidental Dolphin Mortality for U.S. and Foreign Purse Seine Vessels in the Eastern Tropical Pacific Ocean, 1971-1998

Year	U.S. Vessels[1]	U.S. Kill[2]	Foreign Vessels[1]	Foreign Kill[3]	Total Kill[4]
1971	124	246,213	48	15,715	261,928
1972	127	368,600	58	55,078	423,678
1973	133	206,697	68	58,276	264,973
1974	135	147,437	77	27,245	174,682
1975	142	166,645	82	27,812	194,457
1976	155	108,740	94	19,482	128,222
1977	142	25,452	104	25,901	51,353
1978	101	19,366	121	11,147	30,513
1979	93	17,938	121	3,488	21,426
1980	89	15,305	132	16,665	31,970
1981	94	7,890	118	7,199	35,089
1982	89	23,267	97	5,837	29,104
1983	60	8,513	99	4,980	13,493
1984	34	17,732	91	22,980	40,712
1985	36	19,205	105	39,642	58,847
1986	34	20,692	101	112,482	133,174
1987	34	13,992	126	85,195	99,187
1988	37	19,712	95	59,215	78,927
1989	29	12,643	93	84,336	96,979
1990	29	5,083	94	47,448	52,531
1991	13	1,004	90	26,288	27,292
1992	7	431	90	15,108	15,539
1993	7	115	89	3,486	3,601
1994	7	106	75	3,989	4,095
1995	5	0	99	3,274	3,274
1996	6	0	88	2,547	2,547
1997	6	0	92	3,000	3,000
1998	6	24	92	1,853	1,877

[1]Data from Inter-American Tropical Tuna Commission (IATTC).
[2]Data from National Marine Fisheries Service (NMFS).
[3]Derived by subtracting U.S. data from IATTC total mortality estimates of sets made on dolphin during the period.
[4]Data for 1971-78 from NMFS; data after 1978 from IATTC using MPS method.

Appendix D. Cetacean Strandings in 1998

	1998				
Species	NE	SE	SW	NW	AK
Balaenidae					
Northern Right Whale		1			
Bowhead Whale					1
Balaenopteridae					
Blue Whale	1				
Fin Whale	4	1	1		2
Humpback Whale	4	3	4	2	11
Minke Whale	5	2	1	1	
Unid. Balaenopterid	4				
Eschrichtiidae					
Gray Whale			30	4	5
Unidentified Baleen Whale	4	4	2	1	
Physeteridae					
Sperm Whale	1				1
Dwarf Sperm Whale		12			
Pygmy Sperm Whale	4	39	7		
Pyg. or Dwf. Sperm Whale		3			
Ziphiidae					
Blainville's Beaked Whale	1				
Cuvier's Beaked Whale		4	3	1	1
Gervais' Beaked Whale		14			
Stejneger's Beaked Whale					1
Peruvian Beaked Whale			1		
Monodontidae					
Beluga					36
Delphinidae					
Killer Whale				1	2
Pygmy Killer Whale		4			
Melon-Headed Whale			2		

Appendix D(cont).Cetacean Strandings in 1998

	1998				
Species	NE	SE	SW	NW	AK
Delphinidae (cont.)					
Long-finned Pilot Whale	7				
Short-finned Pilot Whale		15			
Atlantic White-sided Dolphin	90				
Pacific White-sided Dolphin			5	1	2
Risso's Dolphin	4	5	3		
Rough-Toothed Dolphin		14	1		
Long-snouted Spinner		1			
Short-snouted Spinner		1			
Atlantic spotted Dolphin		7			
Bottlenose Dolphin	69	523	5		
Striped Dolphin	2	1	2		
Common Dolphin	25	2	35		
Northern Right Whale Dolphin			1		
Unidentified Dolphin	2	9	12		
Phocoenidae					
Dall's Porpoise			2	2	1
Harbor Porpoise	48	4	37	25	2
Unidentified Cetacean			1		5
Unidentified Odontocete	2			5	
TOTAL CETACEAN	**283**	**672**	**147**	**43**	**70**

Appendix E. Pinniped Strandings in 1998

	1998				
Species	NE	SE	SW	NW	AK
Otariidae					
California Sea Lion			2576	75	
Steller Sea Lion			10	7	16
Guadalupe Fur Seal			3		
Northern Fur Seal			21	1	5
Phocidae					
Gray Seal	51				
Harbor Seal	242	13	313	121	13
Harp Seal	107				
Hooded Seal	106				
Northern Elephant Seal			409	24	1
Ringed Seal	1				1
Unidentified phocid	11			5	
Unidentified pinniped			236	77	1
Unidentified otariid				18	2
TOTAL PINNIPED	**518**	**13**	**3568**	**328**	**40**
TOTAL MARINE MAMMALS (cetaceans and pinnipeds)	**801**	**685**	**3612**	**371**	**110**

Appendix F: NMFS Protected Resources Headquarters, Regional Offices and Fisheries Science Centers

NMFS Office of Protected Resources
1315 East-West Highway
Silver Spring, Maryland 20910
phone (301) 713-2322
fax (301) 713-0376
http://www.nmfs.gov/prot_res.html

NMFS Northeast Region
One Blackburn Drive
Gloucester, MA 01930
phone (978) 281-9328
fax (978) 281-9394
http://www.wh.whoi.edu/ro/doc/nero.html

NMFS Northeast Fisheries Science Center
166 Water Street
Woods Hole, MA 02543
phone (508) 495-2361
fax (508) 495-2258
http://wh.whoi.edu

NMFS Southeast Region
9721 Executive Center Drive
St. Petersburg, FL 33702-2432
phone (727)570-5312
fax (727) 570-5517
http://caldera.sero.nmfs/gov

NMFS Southeast Fisheries Science Center
75 Virginia Beach Drive
Miami, FL 33149
phone (305) 361-4284
fax (305) 361-4219
http://www.sefsc.noaa.gov

NMFS Northwest Region
7600 Sand Point Way NE
Seattle, WA 98115-0070
phone (206) 526-6150
fax (206) 526-6426
http://www.nwr.noaa.gov

NMFS Northwest Fisheries Science Center
2725 Montlake Blvd. E., West Bldg.
Seattle, WA 98112
phone (206) 860-3200
fax (206) 860-3217
http://research.nwfsc.noaa.gov/nwfsc-homepage.html

NMFS Southwest Region
501 West Ocean Blvd., Suite 4200
Long Beach, CA 90802-4213
phone (562) 980-4020
fax (562) 980-4027
http://swr.ucsd.edu

NMFS Southwest Fisheries Science Center
8604 La Jolla Shores Drive
P.O. Box 271
La Jolla, California 92038-0271
phone (619) 546-7000
fax (619) 546-7003
http://swfsc.ucsd.edu

NMFS Alaska Region
709 W. 9th St., Federal Building Rm. 461
P.O. Box 21668
Juneau, AK 99802
phone (907) 586-7235
fax (907) 586-7012
http://www.fakr.noaa.gov

NMFS Alaska Fisheries Science Center
7600 Sand Point Way NE, Bldg. 4
Seattle, WA 98115
phone (206) 526-4000
fax (206) 526-4004
http://www.afsc.noaa.gov