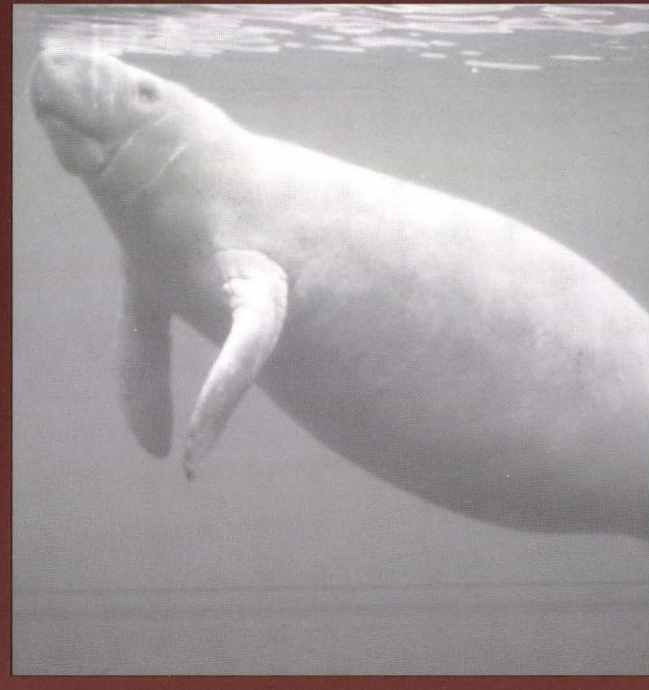
Administration of the Marine Mammal Protection Act of 1972

January 1, 1993 to December 31, 1993



U.S. Department of the Interior • U.S. Fish and Wildlife Service
Washington, DC 20240

Department of the Interior

U.S. Fish and Wildlife Service

Marine Mammal Protection Act

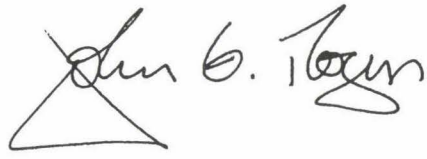
Report of the Department of the Interior

The Marine Mammal Protection Act of 1972, as amended (16 U.S.C. 1361-1407, 86 Stat. 1027 (1972), 95 Stat. 979 (1981), 98 Stat. 440 (1984), 100 Stat. 3741 (1986), 102 Stat. 4755 (1988), and 108 Stat. 532 (1994)) states in Section 103(f) that:

> "Within six months after the effective date of this Act [December 21, 1972] and every twelve months thereafter, the Secretary shall report to the public through publication in the *Federal Register* and to the Congress on the current status of all marine mammal species and population stocks subject to the provisions of the Act. His report shall describe those actions taken and those measures believed necessary, including where appropriate, the issuance of permits pursuant to this title to assure the well-being of such marine mammals."

The responsibility of the Department of the Interior is limited by Section 3(11)(B) of the Marine Mammal Protection Act to those marine mammals that are members of the Orders Carnivora (polar bear, sea otter, and marine otter), Pinnipedia (walrus), and Sirenia (manatee and dugong). Accordingly, published herewith is the report of the Department of the Interior for the period of January 1, 1993, to December 31, 1993, on the administration of the Marine Mammal Protection Act with regard to those mammals.

Issued at Washington, D.C., dated June 4, 1996



Acting Director

Administration of the Marine Mammal Protection Act of 1972

January 1, 1993 to December 31, 1993

U.S. Department of the Interior • U.S. Fish and Wildlife Service
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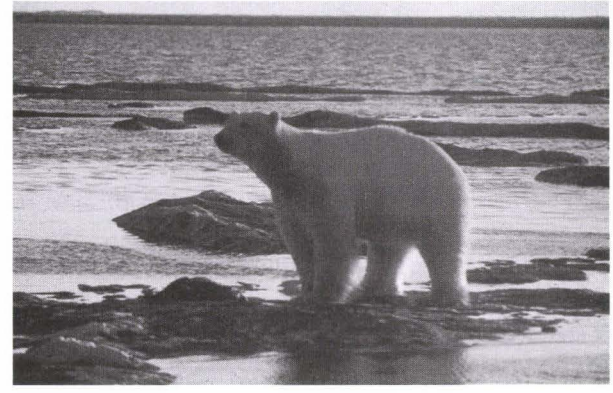
Introduction

Authority

The passage of the Marine Mammal Protection Act of 1972, hereafter referred to as the Act, gave the Department of the Interior (Department) responsibility for manatees, polar bears, walruses, sea and marine otters, and dugong. Within the Department, the Fish and Wildlife Service (Service) is responsible for managing these marine mammals and for enforcing the moratorium on taking and importing marine mammals and marine mammal parts.

The Service administers requests for waiving the moratorium and for the transfer of management authority to States, issues permits, conducts research programs, enforces provisions of the Act, publishes rules and regulations to manage marine mammals, cooperates with the States, and participates in international activities and agreements. In addition, the Service lists and delists species as endangered or threatened and undertakes other Endangered Species Act (ESA)-related responsibilities and maintains a close working relationship with the Marine Mammal Commission (MMC) and its Committee of Scientific Advisors.



Polar bear. U.S. Fish and Wildlife Service photo by Dave Olson.

During the period of time covered by this report, there were no significant changes to the listed status of any of the species of marine mammals whose management is the Service's responsibility.

Species List

Species list and Status of Marine Mammals Under Service Jurisdiction Under the Act and the Endangered Species Act

Species		Marine Mammal Protection Act	Endangered Species Act
Common Name	Scientific Name		
Polar bear	*Ursus maritimus*	Yes	No
Sea otter-Alaska	*Enhydra lutris lutris*	Yes	No
Sea otter-southern	*Enhydra lutris nereis*	Yes	Threatened
Marine otter	*Lutra felina*	Yes	Endangered
Walrus	*Odobenus rosmarus*	Yes	No
Dugong	*Dugong dugon*	Yes	Endangered*
West Indian manatee	*Trichechus manatus*	Yes	Endangered
Amazonian manatee	*Trichechus inunguis*	Yes	Endangered
West African manatee	*Trichechus senegalensis*	Yes	Threatened

* The dugong is listed as endangered throughout its entire historic range except when it occurs in the United States.

Summary of the 1993 Program

Appropriations

For Fiscal Year (FY) 1993, the Service's funding authorization was under authority of Section 116(b) of the Act as adopted in the 1988 amendments (102 Stat. 4755), while the Service's funding authorization for FY 1994 was under Section 116(b) of the Act as adopted in 1994 amendments (108 Stat. 532). Calendar year 1993 covered by this report overlaps FYs 1993 and 1994; funds (in $000) authorized for both years, as well as funds spent in FY 1993 and projected to be spent in FY 1994, are presented.

	Authorized	Expended	Projected
Fiscal Year 1993	$3,500	$3,763	—
Fiscal Year 1994	$8,000	—	$5,221

Distribution of Expenditures

See table on page 3.

Outer Continental Shelf Operations and Environmental Studies

Service activities on offshore oil and gas leasing were considerably diminished in 1993 than in previous years, reflecting the reduced leasing schedule of the MMS. The majority of activity was in the Gulf of Mexico, where marine mammals under the Service's jurisdiction would not be expected to be affected.

The Service reviewed the Program Action and Alternatives Memorandum for Lease Sale #158, Gulf of Alaska. The Service supported the deletion of lease sale blocks in certain sensitive fishing grounds. This lease sale could affect Steller sea lions, northern fur seals, Alaska sea otters, harbor seals, and killer whales.

Research and Development

The Service conducted research under the Act during FY 1993 at several Centers and Field Stations. The Alaska Fish and Wildlife Research Center (AFWR) is responsible for polar bear, walrus, and northern (i.e., Alaska) sea otter research. The National Ecology Research Center (NERC) in Fort Collins, Colorado, is responsible for all other marine mammal research, including the southern sea otter, manatee, and other depleted species. The Cooperative Fish and Wildlife Research Units Center conducts additional research funded by and in support of the needs of the Service, and other bureaus of the Department.

(Note: When the National Biological Survey (later changed to National Biological Service (NBS)), was created in FY 1994, Service research duties were transferred to NBS. With the transfer, some of the responsibilities outlined in the previous paragraph have changed. Responsibility for the southern sea otter was transferred from NERC to AFWR; the responsibility for the manatee was transferred from NERC to the National Fisheries Research Center-Gainesville. One project originally supported by the MMS was transferred to AFWR; another went to the National Wetlands Research Center in Lafayette, Louisiana.)

For each project active during FY 1993, the project title and summary, followed by highlights of FY 1993 accomplishments are given below by species. Previous results and accomplishments can be found in earlier publications.

1. Polar bear

A. Project Title and Summary:

Population definition and estimation of survival, recruitment, and numbers of polar bears in the Beaufort Sea.

Distribution of Expenditures (in $000)

	Actual FY 93	Projected FY 94
Marine Mammal Protection Act		
Research and Development[1]		
Alaskan sea otter	$ 325	$ 450
Walrus	200	353
Polar bear	850	850
Misc. marine mammals (incl. pinnipeds,cetaceans—formerly MMS funds)	-	884
Total Research and Development	$ 1,375	$ 2,537
Management		
Permit activities	$ 40	$ 45
Law enforcement activities	999	988
Other management activities	1,349	1,651
Total Management	$ 2,388	$ 2,684
Grand Total	$ 3,763	$ 5,221
Endangered Species Act		
Section 6 (Grants-to-States)		
California—sea otter	$ 0	$ 0
Florida—manatee	90	0
Total Section 6	$ 90	$ 0
Section 15 (Research and Development)[1]		
Endangered/threatened otters	$ 498	$ 545
Manatee	670	505
Total Section 15 Research	$ 1,168	$ 1,050
Section 15 (Management)		
Endangered/threatened otters	$ 244	$ 361
Manatee	621	500
Hawaiian monk seal[2]	75	75
Total Section 15 Management	$ 940	$ 936
Grand Total	$ 2,198	$ 1,986

1 For FY 1993, amounts for Research and Development under the Act, and Section 15 Research and Development under the ESA represent the Service's Research and Development (Region 8) marine mammal research figures. In FY 1994, the National Biological Survey (NBS) (subsequently, the National Biological Service) was created. FY 1994 amounts for Research and Development under the Act and the ESA represent NBS marine mammal research figures, including former Region 8, former FWS (non-Region 8) marine mammal funds, and former Minerals Management Service (MMS) contracts on marine mammals which were transferred to NBS.

2 Although the National Marine Fisheries Service (NMFS) has primary responsibility for Hawaiian monk seals, the species utilizes the Hawaiian Islands and Johnston Atoll National Wildlife Refuges. Funds reported are spent for monk seal activities on Refuge lands under authority of the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee).

During March, April, and May, polar bears captured in northern Alaska are permanently marked. Critical population parameters are assessed by analysis of mark/recapture data, catch/effort analysis, and mathematical simulations. Selected females are fitted with radio or satellite transmitters.

1993 Activities/Accomplishments:

- Data analyses completed in 1993 revealed that annual survival rates for polar bears in the Beaufort Sea were 0.975 for adults and 0.68 for cubs. Confidence intervals on these estimates were the tightest ever calculated for polar bears. The adult rate is the highest ever calculated.
- Parameters related to recruitment suggest low rates of reproduction in the Beaufort Sea population. Although the population total appears to have nearly doubled during the past 20 years, recruitment is lower than in many other populations and is lower in the Beaufort Sea than it was there 20 years ago. The low recruitment observed appears to be a density-dependent response to increases in total numbers.

B. Project Title and Summary:

Relationships between polar bears, sea ice movement and condition, and pagophilic seals.

High altitude aircraft and satellite imagery are used along with drifting buoy data to classify ice movements and conditions. Foraging methods used by polar bear are determined by radio tracking and snow tracking. Prey species, frequency of kills, habitat types, and hunting methods are recorded.

1993 Activities/Accomplishments:

- The large number of platform terminal transmitter (PTT) tags deployed in 1992 meant that numerous collars were still operational in 1993. Hundreds of relocations were obtained, and multi-year monitoring of radio-collared bears continued.
- General movements studies terminated with completion of this work unit in FY 1993. Analysis of data relevant to movements and distribution of polar bears in the Beaufort Sea was begun in 1993 and is scheduled for completion in FY 1994.

C. Project Title and Summary:

Population definition and estimation of survival, recruitment, and number of polar bears in northwestern and western Alaska.

During March and April, Alaskan polar bears captured in the western portions of Arctic Alaska are permanently marked. Assessment of critical population parameters are achieved through continued analyses of mark/recapture data, catch/effort data, and mathematical simulations. Work also includes the development and implementation of a U.S./Russian polar bear census.

1993 Activities/Accomplishments:

- In 1993, six previously collared females were recaptured and fitted with new satellite collars, and an additional 23 females were captured and fitted with satellite collars.
- The work in the Novosibirsk Islands did not occur on schedule due to logistical difficulties, and was shifted to Wrangel Island. Work on Novosibirsk Islands has been rescheduled for spring 1994, requiring a revised completion date for the unit. The U.S./Russian joint census was rescheduled for fall 1995.
- The data base on polar bear movement patterns was expanded during 1993, with a special effort to expand the Russian capture area into the East Siberian Sea. Movement patterns of East Siberian Sea collared bears do not indicate a distinct separation between bears denning on Wrangel Island and those on the Chukotka mainland west of Cape Shmidt.
- The western bounds of the Chukchi Sea bear population cannot be defined without marking bears in the Novosibirsk Islands.

D. Project Title and Summary:

Inter-relationships between sea ice habitats and polar bear distributions in the Bering and Chukchi Seas in northwestern Alaska.

Remotely sensed data on ice types, distributions, and movements are being analyzed with reference to concurrent locational data from satellite instrumented polar bears in the Bering and Chukchi Seas. Location of denning activity is also being recorded. All locational data is routinely integrated into geographic information systems (GIS).

1993 Activities/Accomplishments:

- Additional digital tapes of Advanced Very High Resolution Radiometry (AVHRR) images of sea ice coverage in the Bering and Chukchi seas were acquired for input into the GIS.
- Data from hydrometeorological stations in Russia will require digitizing, but operational

funds are not available from the Russian government.

- Special Sensor Microwave/Imager (SSM/I) data from satellite-based passive microwave scanners were used to estimate sea ice cover and will be used in 1994 to evaluate sea ice habitat use patterns of polar bears. Initial tests of uses for the SSM/I data indicate that the scale of resolution is coarse, allowing investigation of regional use patterns only. Also, available statistical methods cannot address the temporal and spatial variation of ice cover in studies of habitat selection by polar bears.

2. Alaska sea otter

A. Project Title and Summary:

Biological information necessary to establish a zonal management program for sea otters in Alaska.

In response to real and perceived conflicts between sea otters and commercial and recreational fisheries over shellfish resources, the implementation of a zonal management program for sea otters has been suggested. Movements, mortality, and reproduction of sea otters at Kodiak Island and Prince William Sound are monitored using instrumented sea otters. Genetic and enzyme variation within the sea otter population is determined through the analysis of tissue samples collected from captured sea otters.

1993 Activities/Accomplishments:

- Tissue samples were collected from the final population of sea otters translocated from Amchitka Island to Vancouver Island, which will enable evaluation of the effects of translocations on sea otter genetic diversity.
- Analysis of mitochondrial DNA (mtDNA) and allozymes were completed for tissues collected in 1992 and will continue on new samples. Results of mtDNA analysis continue to suggest that these techniques may be suitable in identifying geographically separate populations that may assist in developing zonal management plans.
- Additional sea otters were fitted with radio transmitters to increase the total number of instrumented otters to 80. Age-specific reproductive information is being gathered in addition to time-activity budgets and food habits. Several manuscripts have been prepared and submitted.
- Preliminary results suggest that reproductive rates of mature female sea otters at Amchitka Island may be below the 0.93 rate observed at Kodiak Island. Pupping intervals may average over 400 days at Amchitka, compared to 365 days at Kodiak.
- Foraging behavior at Amchitka appears greatly influenced by the presence of large numbers of the smooth lumpsucker (Aptocyclus ventricocus) which was extensively preyed upon by otters in 1993. Effects of this new and abundant prey on reproduction, survival, and foraging success remain to be determined by continuation of the project.

B. Project Title and Summary:

Interactions between sea otters and fisheries in Alaska.

Research is being conducted to assess: (1) sea otter diets with an emphasis on the importance of commercial species of shellfish; (2) the impacts of sea otter foraging behavior and activity on sub-tidal benthic communities, status of sea otter populations, and assessment of habitat; and (3) the recovery of the Prince William Sound sea otter population.

1993 Activities/Accomplishments:

- Development of a standardized sea otter survey method continued through the evaluation of suitable viewing platforms, documentation of observer differences, and the conduct of a trial survey in Prince William Sound using data and techniques developed over the last two years.
- A federal permit was obtained to test 15 TDR/radio transmitter packages in sea otters; packages are still under development.
- A new study plan was implemented in 1993 as a cooperative venture with Glacier Bay National Park (GBNP), the University of Alaska, and the NMFS. It is designed to evaluate the relative impact of commercial crab fisheries and sea otter predation on dungeness crab populations in GBNP.
- Visual observations of foraging sea otters in GBNP revealed the following patterns: (1) diving success rates and foraging dive times were comparable regardless of whether the area had been occupied for at least 5 years or more recently; (2) sea otters foraging in areas occupied for more than 5 years recovered a smaller proportion of large prey items; and (3) economically valuable crab species were more frequently taken in areas recently occupied and the densities of

these crab species were greater in areas not occupied by sea otters.

C. Project Title and Summary:

Magnitude, extent, and duration of impacts from the Exxon Valdez oil spill on sea otter populations.

The long-term effects of the Exxon Valdez oil spill on sea otters, including effects on individuals from chronic exposure to petroleum contaminants and effects on populations of ecosystem alterations, are being assessed. Aerial surveys of sea otter occurrence, carcasses, and telemetry data on movements and behavior are studied in order to compare populations in oiled and unoiled habitats; current populations are compared with the long-term data base collected on sea otters in the area.

1993 Activities/Accomplishments:

- Damage assessment efforts related to the Exxon Valdez spill were completed and 18 final reports were submitted and associated manuscripts developed.
- Restoration research was continued that examined age structure in carcasses to determine whether continued damage is occurring.
- A synthesis of estimates of immediate losses of sea otters following the spill indicates that 3,500-5,000 otters died acutely. Studies suggest that damages are persisting and recovery of the population is delayed. Abnormal mortality patterns (a high proportion of prime age carcasses from oiled areas) continues. Otters radio tracked following their release from rehabilitation centers in 1989 have had decreased survival and reproduction relative to non-treated otters in the wild.

3. Pacific walrus

A. Project Title and Summary:

Techniques to monitor movements for population assessment, age/sex composition, behavior, and estimates of populations of walrus.

Distribution and haulout behavior of Pacific walruses are determined using telemetry data on instrumented walruses. This information is necessary to quantify biases in the joint US-Russian walrus survey results.

1993 Activities/Accomplishments:

- A review of the walrus research program was conducted by a group of marine mammal experts in May 1993, and key areas of future research needs were identified. Plans for FY 1994 include completion of the review process for the walrus research project with the aim of developing new project objectives and study plans to address them.
- The following manuscripts of research results are in preparation—"Chemical immobilization of Pacific walruses," "Performance of satellite transmitters on Pacific walruses, 1987-1991," "Detecting Pacific walrus population trends with aerial surveys," "Autumn distribution of Pacific walruses resting on ice in the northwest Chukchi Sea," and "Estimation of the number of Pacific walruses in Bristol Bay, AK, in summer."

4. Miscellaneous Marine Mammals

(work units which study several marine mammal species)

A. Project Title and Summary:

Use of DNA to define populations of birds, mammals, and fish of Alaska.

DNA analyses of animal populations are evaluated to assess their usefulness in quantifying genetic relationships among animal populations. Animal movement patterns are compared with genetic patterns to determine information about current and past levels of gene flow and differentiation of subpopulations. Studies are conducted on sea otters, polar bears, and walruses.

1993 Activities/Accomplishments:

- A new Principal Investigator was hired in 1993. The tissue study on polar bears has been completed; a manuscript has been submitted on the walrus work; collection of tissue samples of sea otters continues in cooperation with the Canadian Wildlife Service. Work on this project is nearing completion.

B. Project Title and Summary:

Population status and trends in marine mammals in Alaska.

Although this work unit is still in development, it will include work on physiological and biochemical measures of condition, survey methodologies, and population models in marine mammals. Initial work will focus almost exclusively on walrus.

1993 Activities/Accomplishments:

- This work unit is being initiated in FY 1994 and thus it is too early to report any accomplishments.

C. Project Title and Summary:

Alaska Marine Mammal Tissue Archival Project. (Note: At the beginning of FY 1994, the NBS assumed the administration of this project for the MMS.)

The study collects and archives representative marine mammal tissues for future contaminant analyses and documentation of long-term trends in environmental quality, potentially associated with oil and gas development in Alaskan waters. Collections are limited to freshly-killed specimens taken under rigorously controlled conditions by researchers associated with ongoing programs or subsistence hunters. Tissue samples are archived with the National Biomonitoring Specimen Bank, National Institute of Standards and Technology. Tissue aliquots are analyzed for quality control and the results published in annual reports and refereed journals.

1993 Activities/Accomplishments:

- Work is proceeding as scheduled. Samples have been collected from a variety of marine mammals including ringed, spotted, harbor, bearded, and northern fur seals; Steller sea lion; beluga and bowhead whales; and Pacific walrus.
- The project has not analyzed every archived sample. However, aliquots of some of the samples have been analyzed for chlorinated hydrocarbons and heavy metals in order to monitor changes in the samples during storage and to determine the baseline levels of contaminants in a few of the species. Although analysis has been quite limited at this time, existing results suggest that the beluga whale warrants further attention regarding contaminant loads, particularly PCBs and chlorinated pesticides in its blubber.

D. Project Title and Summary:

Distribution and abundance of marine mammals in the North-Central and Western Gulf of Mexico. (Note: At the beginning of FY 1994, the NBS assumed the administration of this project for the MMS.)

The goal of this project is to determine the seasonal and geographic distribution and movements of cetaceans in areas potentially affected by future oil and gas activities along the continental slope in the nor thcentral and western Gulf of Mexico. This is being accomplished through the use of systematic aerial and shipboard visual surveys, shipboard acoustic surveys, conventional and satellite telemetry of sperm whales, environmental data gathering on habitat use patterns, and behavioral descriptions to assess age and sex configurations, preferred areas and times of travelling, resting, socializing, feeding, and to calibrate aerial surveys.

1993 Activities/Accomplishments:

- This project is proceeding on schedule. An Interim Report is expected in April-May 1994. A Draft Final Report is expected in November 1994.

5. Manatee and dugong

A. Project Title and Summary:

Develop a generalized microcomputer capability for field offices to address large-scale resource assessment problems.

This activity is part of a larger effort to develop a prototype decision support tool that is compatible with existing PC standards currently at Service field offices. The prototype will be evaluated in an operational setting on several large-scale resource problems, such as support of Section 7 consultations on the Florida manatee, and to track location, status, and success of mitigation activities.

1993 Activities/Accomplishments:

- Work within this unit in FY 1993 which involved manatees switched to upgrading video technology and software to improve the centralized manatee photoidentification catalog.
- The work unit was completed in FY 1993.

B. Project Title and Summary:

Ecological studies of manatees and dugongs.

Estimates of manatee population size and status are obtained using telemetry data from instrumented manatees. The potential of selected surveys to serve as indices of population density and movement are being evaluated, and the status of the entire Order Sirenia is being assessed.

1993 Activities/Accomplishments:

- Radio tracking studies of manatee movements, migrations, and habitat use in eastern Florida and Puerto Rico continue to provide new information on high-use regions, travel routes, reproduc-

tive events, and mortality, which is used by the Florida State government to regulate boating activities. Ten of the 13 "key" counties now have approved manatee protection speed zones. Manatee Protection Plans will be implemented and revised over the next three years.

- Annual manatee survival estimates were obtained from data in the Manatee Individual Photo-identification System for three regions in Florida (Crystal and Homosassa rivers, Blue Spring, and the east coast). Survival rates are high enough at Crystal River and Blue Spring (> 95 percent) to allow for population growth, while east coast estimates are somewhat lower (approximately 90 percent). Preliminary population viability analysis indicates that Florida manatees have a high probability of surviving another 1000 years, provided that mortality rates do not go up and reproductive rates do not fall.
- Changes in seagrass biomass, density, and species composition were monitored in the Banana River for a third year. Substantial recovery of seagrasses protected from grazing occurred during the second year. Shoal grass appears to be more graze-resistant or resilient than manatee grass.
- The computerized catalog of features on individual manatees was updated into a more efficient photo-CD based system, the Manatee Individual Photo-identification System (MIPS).
- Based on testing in the Banana River in summer 1993, the use of strip-transect aerial surveys with two observers to assess trends in manatee abundance shows promise in areas where water clarity is relatively good, but not for areas where clarity is poor.

6. Southern sea otter

A. Project Title and Summary:

Ecological studies of sea otters and other marine mammals.

Fall and spring range-wide censuses of sea otters in California and Washington and monthly beach walks and censuses in selected areas are conducted. Analysis of this data is used to determine the social structure and patterns of dispersion of sea otters in central California, describe the dispersal characteristics of sea otters in central California, and determine trends in the size, population growth rate, and distribution of sea otter populations in California and Washington.

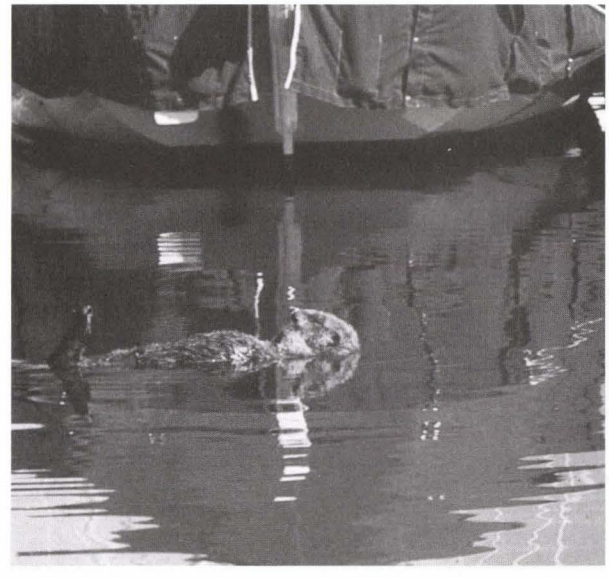
1993 Activities/Accomplishments:

- The mortality rate of dependent pups in the California sea otter is about 50 percent. Although the cause is unknown, this mortality accounts for much of the depressed rate of increase by the California sea otter population.
- Organic contaminant levels (mainly PCBs and DDT+metabolic products) have been found to be high in sea otters from California, and the western Aleutian Islands, but very low in southeast Alaska. Results from California are not surprising because of known high levels of organic contaminants in the California Current. High levels of contaminants in the western Aleutian Islands is surprising and the source is being investigated.
- Spectral analysis has shown that the California sea otter has a broad vocal repertoire, and that certain calls are individually recognizable.

B. Project Title and Summary:

Interactions between sea otters and nearshore ecological communities.

Monthly, seasonal, and inter-annual variation in surface kelp canopies and demographic characteristics of red abalone and other biotic components of sea otter habitats are analyzed and compared with areas not currently supporting sea otters in order to determine the preferred prey species and activity patterns of sea otters, and to clarify the substantial interactions that take place between sea otters and invertebrates and plants in their communities.



California Sea Otter. U.S. Fish and Wildlife Service photo by Jim Leupold.

1993 Activities/Accomplishments:

- The predicted effects of sea otters on kelp abundance (i.e. enhancement) has been found to occur broadly throughout Alaska and British Columbia.
- The abundance of benthic-feeding sea ducks (e.g. eiders and scoters) has been found to correlate negatively with the distribution of sea otters in western Alaska. Duck population declines also have been documented following the recovery of sea otter populations at Attu and Adak Islands in the western Aleutians, Kodiak Island, and Prince William Sound.

C. Project Title and Summary:

Translocation of sea otters.

Capture, transport, and release of sea otters to San Nicolas Island from Morro Bay, California, was undertaken in order to: (1) establish a viable colony of sea otters, (2) determine changes in distribution and abundance of sea otters in the parent and translocated populations, (3) determine changes in behavior and population parameters of sea otters at San Nicolas Island as the population grew and reached equilibrium density, and (4) establish criteria for determining the success of sea otter translocations as a management tool. In mid-July 1991, however, plans to reintroduce additional sea otters to San Nicolas Island were terminated, thereby forcing a reduction in research activities. Research is limited to monitoring the abundance, distribution, and reproductive success of the small colony remaining at San Nicolas Island.

1993 Activities/Accomplishments:

- As of January 1994, there were about 15 independent sea otters and one small pup at San Nicolas Island. This is the highest number of independent sea otters recorded since February 1991. It is too early to conclude that this is an indication of a long-term population increase.
- As of FY 1994, work in this work unit was combined into the two southern sea otter work units described above.

Enforcement

The Service's Division of Law Enforcement investigates known, alleged, or potential violations of the Act involving illegal take or importation of marine mammals or their products for which the Service is responsible. In addition, it assists the NMFS by making apprehensions and conducting investigations in cases involving endangered or threatened species under that agency's jurisdiction. Results of these efforts are referred to the NMFS for its consideration and appropriate action. However, under an NMFS/Service Memorandum of Understanding, the Service retains authority over those investigations that involve endangered or threatened species under the jurisdiction of the Department of the Interior. Violations are referred to the Department of the Interior's Office of the Solicitor for civil action or the Department of Justice for criminal enforcement action.

Forensic scientists at the Clark R. Bavin National Fish and Wildlife Forensics Laboratory (Laboratory) in Ashland, Oregon, continued to provide forensic support to investigators from throughout the world involved in marine mammal protection. The morphology section at the Laboratory examined 71 marine mammal items during 1993 to assist investigators in establishing species identification. The items were examined as part of seven separate investigations and involved seal mandibles, whale teeth, sea lion teeth, polar bear teeth, seal skins, and whale baleen.

Working with reference biological tissues from manatees collected by personnel at the Caribbean Island National Wildlife Refuge and by members of the Caribbean Mammal Stranding Network, Laboratory scientists, in conjunction with a doctorate candidate at Portland State University, examined the genetic structure of populations of manatees and their biographical variations using DNA technology. This information has potential management and enforcement applications.

A species specific nucleic acid sequence in polar bear DNA was found by Laboratory scientists and that sequence has been used to distinguish between polar bear DNA and tissue originating from any of the other seven species of bears. Subsequently, a more rapid test to determine the species of origin of bear parts and products is being developed by amplifying a certain sequence of bear DNA and by enzymatically cleaving that sequence into fragments characteristic of the species of origin.

The Service's Pacific Region increased public outreach efforts during 1993 designed to educate the public about the Act and other wildlife protection statutes. The popular leaflet titled, "Enjoy Our Wildlife in the Pacific," was reprinted in four languages (English, Japanese, Palauan, and Chamorroan). Designed to inform tourists about wildlife trade restrictions, the leaflet includes infor-

mation on marine mammal species including dugong and whales.

The Pacific Region also managed the National Suitcase for Survival and Cargo for Conservation outreach programs during 1993. Initiated in 1990, Suitcase for Survival is a cooperative project designed to teach young people ways in which they can help save threatened wildlife by being an environmentally educated consumer. Participants in the project include the Service, National Fish and Wildlife Foundation (Foundation), World Wildlife Fund, and the American Association of Zoological Parks and Aquariums (AAZPA), using luggage donated by the American Tourister company. The Service fills the suitcases with educational materials, slides, and confiscated wildlife products, then provides them to AAZPA members who, in turn, loan the materials to local schools. Cargo for Conservation is a similar project developed between the Service and the Foundation using boxes donated by the Union Camp Corporation. The Cargo for Conservation boxes are donated directly to museums, nature centers, and schools throughout the United States. Educational material on threatened marine mammals is an important aspect of each project.

Service wildlife inspectors in the Pacific Region continued to closely monitor wildlife entering the country to detect the illegal importation of marine mammals and marine mammal products. Emphasis was placed on the designated wildlife ports of Seattle, Portland, San Francisco, Los Angeles, and Honolulu. Ports of entry on the Washington-Canada border, the California-Mexico border, and at Agana, Guam, also received attention. Approximately 29 separate incidents involving the illegal importation of marine mammals were reported in 1993. Seizures primarily involved products manufactured from whale ivory, whale baleen, walrus ivory, polar bear skins, and seal skins.

Service special agents continue to actively investigate reports of illegal taking of southern sea otters along the California coast. The southern sea otter is listed as a threatened species under the ESA. A commercial fisherman was the subject of a joint Service/California Department of Fish and Game (CDF&G) investigation involving illegally set gill nets off the central California coast. The gill nets had been set inside a closed (fathom restriction) area and abandoned. When retrieved, the nets had killed one sea otter and two harbor seals. The subject pled guilty in State court to charges of fishing in closed waters and failure to display buoys, and received a $2,500 fine and 30 days in jail (suspended). In addition, CDF&G has revoked the person's commercial fishing license for life. Subsequent to the State disposition, the Service's Regional Solicitor filed a civil penalty against the person for the unlawful take of the sea otter. The person has agreed to pay a penalty of $2,500 as settlement.

The "take" of a sea otter, relating to an oil spill near Avila Beach, California, is currently under investigation. The Service is waiting for reports from the CDF&G's Oil Response Unit, to make a determination of possible negligence by the oil company. The spill resulted from underground pipes that broke allowing oil to flow into coastal stream beds and, eventually, into the ocean. Preliminary investigation has indicated the oil company may not have followed State guidelines for pipeline maintenance and inspection. The investigation is continuing.

The "take" of a southern sea otter in Monterey Bay, California, by an individual operating a personal watercraft (jet ski) was reported last year and has resulted in a civil penalty. A $500 penalty was paid on March 1, 1994, pursuant to a settlement agreement. It is noteworthy that this incident and others involving marine mammals and personal watercraft led to significant restrictions on the use of such equipment within the newly formed Monterey Bay National Marine Sanctuary. The personal watercraft "industry" swiftly responded by filing a lawsuit against the Department of Commerce claiming the regulations to be overly restrictive and unfair, and the industry has prevailed during the first round of court action. Continued litigation is anticipated.

Three separate incidents involving the illegal shooting of southern sea otters along the California coast were investigated. Suspects have not been identified in any of the cases.

An investigation into allegations that employees working on commercial sport fishing vessels are killing and injuring protected species of birds (brown pelicans) has resulted in State charges against two subjects for shooting a harbor seal during a recent trip. A Service special agent and a California game warden, acting in a covert capacity, were on-board the vessel when the shooting occurred and, in fact, were able to video tape the incident with a concealed camera. The matter has been set for trial in the spring of 1994.

Marine mammal parts and products were seized in Hawaii, Oregon, and California during 1993 pursuant to the execution of Federal search warrants or in response to information developed during covert contacts. The seizures involved illegally possessed walrus parts in Oregon and California, and Alaska

Pacific walrus. U.S. Fish and Wildlife Service photo.

sea otter pelts in Hawaii. Prosecution is pending in each case. One of the suspects had been apprehended and prosecuted for a similar violation in 1982. In a second case, the suspect was also found to be in illegal possession of eagle, owl, and hawk feathers, and narcotics.

A Tacoma, Washington, resident pled guilty in U.S. District Court in Juneau, Alaska, to having offered for sale four Alaska sea otter hides. The individual acquired the hides in southeast Alaska and transported them to the Seattle area, where he offered them to agents acting in a covert capacity. The individual was fined $25, and sentenced to serve nine months in jail, and two years probation.

A Seattle, Washington, resident pled guilty in U.S. District Court to one count of sale of 62 Alaska sea otter hides. He was sentenced to six-month house arrest, and put on probation for two years. This subject was acting on behalf of an Alaskan Native.

Several reports were received regarding Alaskan Natives selling in the Seattle area sea otter blankets that were loosely stitched together. The apparent purpose of the loose stitching was to enable a purchaser to separate the pelts so that they could be made into jackets and other articles by non-Natives. Some were allegedly being offered for export. All of the reports were fragmentary, and not enough information was gained to identify the subjects involved.

Seven hunters from Little Diomede Island were charged with "wasteful take" of marine mammals in a case involving the take of approximately 100 walrus. All seven hunters pled guilty and received jail sentences ranging from eight to 21 months. In addition, sentencing for each included one year probation following their release from jail.

Two incidents involving aircraft harassment of walrus on the Togiak National Wildlife Refuge were investigated during 1993. In one case, the defendant pled guilty and was fined $500; there was insufficient evidence in the second case to prosecute.

A hunter from St. Lawrence Island was cited for "wasteful take" of walrus when, upon his return from the hunting grounds, it was discovered that he was in possession of three walrus heads and no meat. The hunter was fined $500.

A Nome, Alaska, businessman paid a $1,000 fine when he was convicted for the illegal importation and sale of walrus ivory from Russia. This was his second conviction for violating provisions of the Act.

Public outreach efforts in northwest Alaska concerning the wasteful take of marine mammals included meetings with representatives from local villages, radio and television broadcasts of enforcement plans, and news releases to local newspapers explaining planned upcoming law enforcement protection efforts.

Continued prosecution of the 18-month undercover case, "Operation Whiteout," involving the illegal trade of marine mammal parts, has resulted in the conviction of 30 subjects to date. Sentencing thus far has resulted in fines totalling $21,770, restitution to the Service in the amount of $43,179, and incarcerations totalling 19.75 years, with 23.33 years supervised probation. It is expected that an additional 20 subjects will be charged in this investigation.

Permits and Registrations

The Act prohibits the take or import of marine mammals and marine mammal products although exceptions may be made under permits for scientific research, public display, or to enhance the survival or recovery of a species or stock. In order to enable marine mammal hides to be tanned and to facilitate trade of products among Alaskan Natives, registered agent/tannery permits may be issued to non-Alaskan Natives (i.e., persons other than Alaskan Indians, Eskimos, or Aleuts). Registered agents may purchase and sell raw parts and tanned skins from and to Alaskan Natives or other registered agents. Raw parts may be transferred (not sold) to registered tanners for further processing. Registered tanners may transfer (not sell) parts received for processing to Alaskan Natives or registered agents, only.

Section 104 of the Act authorizes the Director of the Service, acting on behalf of the Secretary of the Interior, to issue permits for the activities identified

above. Applicable provisions are found in Title 50 of the Code of Federal Regulations—50 CFR 18.23(d) for registered agent/tannery permits and 50 CFR 18.31 for scientific research or public display permits. Regulations will be developed for issuance of permits for enhancement of the survival or recovery of a species or stock.

During 1993, three new permits and three amendments were issued for scientific research, and one permit was issued to enhance survival or recovery. Five permits were issued for public display. Thirteen parties either registered or renewed their registration as agents and/or tanneries.

The following is a brief description of permit actions taken in 1993.

Scientific Research Permits

1. Permit PRT-766818 was issued effective 05/22/93 through 09/30/95 for the NBS, Alaska Fish and Wildlife Research Center, Anchorage, Alaska, authorizing the take of 200 northern sea otters (Enhydra lutris lutris) and 50 southern sea otters (E. l. nereis). Through the use of time-depth recorder (TDR) technology the research will provide an estimate of the maximum depth of sea otter foraging and a profile of the distribution of foraging activity within a defined band, and relate dive profile data with dietary and habitat utilization data. Authorized activities include capture, recapture, sedation, collection of blood, urine and fat samples, flipper tagging, injection of subcutaneous transponder chip and tetracycline, and surgical implantation of 100 northern sea otters and 15 southern sea otters with a TDR/transmitter package.

2. Permit PRT-776866 was issued jointly by the NMFS and the Service on 06/02/93 to the NMFS, Alaska Fisheries Science Center, National Marine Laboratory, Seattle, Washington, authorizing aerial surveys for spotted seals (Phoca largha) in waters off Alaska and in the Bering Sea over a 3-year period. The permit was issued jointly to allow for the incidental harassment of other marine mammals during flights, including walrus.

3. Permit PRT-773494 was issued effective 12/30/93 through 05/30/98 for the Florida Department of Natural Resources, Florida Marine Research Institute, St. Petersburg, Florida, authorizing take activities and the export of skeletal remains and tissue samples with wild West Indian manatees and rescued, rehabilitated, and released manatees for scientific research purposes. The research is aimed at providing a better understanding of mortality and seasonal movement patterns, habitat requirements, population trends, and biomedical characteristics so as to better manage the species throughout its range. Authorized activities include attaching platform terminal transmitter (PTT) tags on up to 60 wild and 30 rescued manatees per year; implantation of integrated transponder (PIT) tags in up to 80 manatees (60 wild caught and 20 rescued) per year; freeze branding with liquid nitrogen in place of a PIT tag on up to 80 manatees per year; tail notching up to 20 manatee calves incidentally captured with adults per year; collection of samples of blood, milk, urine, tissue and feces from up to 60 wild and 20 rescued manatees per year; and recapture of each animal up to 10 times per year for replacement, adjustment, or removal of radio tags.

4. Permit PRT-740507 was amended effective 09/27/93 through 04/30/94 for the NBS, Alaska Fish and Wildlife Research Center, Anchorage, Alaska, authorizing the import of blood samples collected from live sea otters in Canada and Russia while conducting research with foreign counterparts. Samples will be used to analyze serum chemistry, hormones, and genetics for scientific research purposes.

5. Permit PRT-690715 was amended effective 11/23/93 through 8/31/94 to the NBS, Alaska Fish and Wildlife Research Center, Anchorage, Alaska, to take up to five walrus (Odobenus rosmarus) on the west coast of Alaska and the Bering and Chukchi Seas to aid in the understanding of population dynamics of the species. This amendment changed the name of the permittee from the Service to the NBS.

6. Permit PRT-690038 was amended effective 11/23/93 through 10/31/95 to the NBS, Alaska Fish and Wildlife Research Center, Anchorage, Alaska, to take up to 200 polar bears (Ursus maritimus) on the north and west coasts of Alaska, Beaufort and Chukchi Seas, and high seas and areas adjacent to aid in the understanding of population dynamics of the species. This amendment changed the name of the permittee from the Service to the NBS.

Enhancement of Survival or Recovery Permits

1. Permit PRT-770191 was issued effective 01/08/93 through 01/31/98 for the Service, Jacksonville Field Office, Jacksonville, Florida, authorizing take activities with an unspecified number of West Indian manatees for the purpose of enhancing the survival and recovery of this species consistent with the Service's recovery plan developed under the ESA. Authorized activities include rescue, providing medical treatment (including routine sampling for diagnostic and treatment purposes), rehabilitation and, if feasible, release to the wild. Dead specimens may be salvaged. The permittee may issue Letters of Authorization to any Federal or State agency, public or private institution, or other person as may be necessary to carry out activities pursuant to this permit. In accordance with the Act, public display of manatees is authorized under this permit only if it is incidental to rehabilitation activities.

Public Display Permits

1. Permit PRT-765191 was issued 01/08/93 for the Niigata City Aquarium, Japan, authorizing the take (harass, capture, handle, transport, and maintenance) of one male and three female Alaska sea otters for the purpose of public display.
2. Permit PRT-765480 was issued 01/09/93 for the Noboribetsu MarinePark Aquarium, Japan, authorizing the take (harass, capture, handle, transport, and maintenance) of one male and four female Alaska sea otters for the purpose of public display.
3. Permit PRT-765481 was issued 01/09/93 for the Osaka Aquarium "Kaiyu-Kan," Japan, authorizing the take (harass, capture, handle, transport, and maintenance) of one male and four female Alaska sea otters for the purpose of public display.
4. Permit PRT-765594 was issued 01/09/93 for the Yomiuri Land Marine Aquarium, Japan, authorizing the take (harass, capture, handle, transport, and maintenance) of one male and four female Alaska sea otters for the purpose of public display.
5. Permit PRT-776441 was issued 07/12/93 for the Virginia Department of Game and Inland Fisheries, Richmond, Virginia, authorizing the import of one polar bear hide from the Department of Natural Resources, Manitoba, Canada, for the purpose of public display to be used in their educational program on North American bears developed for school audiences. The polar bear was taken as a problem/nuisance bear by the Chief of Game and Fur, Department of Natural Resources, Manitoba, Canada.

Registered Agent/Tannery Permits

1. Permit PRT-773799, John S. Stames, D.B.A. Arctic Enterprises, Anchorage Alaska was registered as an agent on 03/02/93.
2. Permit PRT-776571, Daniel Leslie Magone, Dutch Harbor, Alaska, was registered as a tannery on 03/23/93.
3. Permit PRT-781949, Robert T. Anderson, Gambell, Alaska, was registered as an agent on 10/21/93.
4. Permit PRT-769121, Fennish Gardner, Anchorage, Alaska, was registered as an agent on 01/08/93.
5. Permit PRT-751287, renewed the registration of Ron Alleva, Anchorage, Alaska, as an agent on 05/10/93.
6. Permit PRT-755879, renewed the registration of The Cutting Edge, Bethel, Alaska, as an agent on 05/01/93.
7. Permit PRT-756124, renewed the registration of Shishmaref Traditional Industries, Shishmaref, Alaska, as a tannery on 04/23/93.
8. Permit PRT-722615, renewed the registration of Johnny L. Palmer, Ketchikan, Alaska, as an agent on 06/08/93.
9. Permit PRT-742069, renewed the registration of Gary B. Jones, Anchorage, Alaska, as an agent on 08/09/93.
10. Permit PRT-748545, renewed the registration of Alaskan Treasures, Anchorage, Alaska, as an agent on 02/24/93.
11. Permit PRT-717725, renewed the registration of Alaska Native Cultural Arts Exchange, Anchorage, Alaska, as an agent on 08/09/93.
12. Permit PRT-691228, renewed the registration of Vancouver Taxidermy and Royal Fur Dressing Inc., Vancouver, Washington, as an agent/tannery on 02/03/93.

13. Permit PRT-671391, renewed the registration of Frontier Tanning Company, Anchorage, Alaska, as an agent/tannery on 09/04/93.

International Activities

US-Russia Environmental Agreement: Marine Mammal Project

The Service, in partnership with the NMFS, the Alaska Department of Fish and Game (ADF&G), the All-Russian Institute for Fisheries and Oceanography (VNIRO), and the Russian Academy of Sciences, led a comprehensive program of laboratory and field research in 1993. Two American scientists and 17 Russian scientists took part in 7 exchanges.

During February and March, a Russian scientist from Kamchatka carried out northern fur seal laboratory studies at the National Marine Mammal Laboratory in Seattle, and cooperated on a joint publication on the early growth and survival of northern fur seal pups.

In June, a researcher from the Hubbs Marine Research Institute in San Diego travelled to Moscow to collaborate with staff of the Koltzov Institute of Developmental Biology in work on age determination of elephant seals through tooth analysis.

An ADF&G biologist travelled to Kamchatka in July to continue studies on satellite-linked radio tagging of larga seals with personnel from the Russian Academy of Sciences.

A Russian biologist from Kamchatka joined U.S. specialists for three weeks in September in conducting harbor seal surveys in southeast Alaska.

The fourth in a series of U.S.-Russia Sea Otter Workshops was held in Wasilla, Alaska, in October. Eight Russians attended.

A Russian sea otter habitat specialist from Kamchatka visited Seattle in October-November for discussions with U.S. colleagues.

An eight member Russian delegation visited Anchorage in December to attend the annual U.S.-Russia Marine Mammal Working Group Meeting to review work completed in 1993 and plan joint work for 1994.

Status Reports

Polar Bear

Harvest Summary

The Marking, Tagging, and Reporting Program conducted by the Service's Marine Mammals Management Office in Anchorage, Alaska, continued to collect information about polar bears taken by Native hunters in coastal villages for subsistence purposes. The Alaska kill during the period from July 1, 1992, to June 30, 1993, totaled 70 bears and was comprised of 44 males, 17 females, and 9 for which the sex was not known [Table 1]. The kill was 40 percent below the 13-year average (117 bears). This was the third consecutive year of below average harvest. The sex ratio of males to females for known sex animals was 72:28. The long-term harvest sex ratio is 66:34. The harvest was evenly divided between the Chukchi Sea (49 percent) and the Beaufort Sea (51 percent) population stocks.

The harvest occurred in all months with a peak in December (21 percent) [Table 2]. Ages based on

Table 1. Alaska Polar Bear Harvest: July 1, 1992 to June 30, 1993.

Village	Male	Female	Unknown	Total
Kaktovik*	3	-	1	4
Nuiqsut*	-	-	-	-
Barrow*	17	6	2	25
Atqasuk*	-	-	-	-
Wainwright*	3	2	2	7
Point Lay	2	-	-	2
Point Hope	5	5	1	11
Kivalina	-	-	-	-
Shishmaref	3	1	3	7
Wales	4	-	-	4
Diomede	4	2	-	6
Savoonga	-	-	-	-
Gambell	3	1	-	4
Totals	44	17	9	70
Percent of Total	(62.8)	(24.3)	(12.9)	(100)

* Denotes villages party to the Inuvialuit Game Council /North Slope Borough (ICG/NSB) Polar Bear Management Agreement.

Table 2. Monthly Polar Bear Harvest, Alaska: July 1992 to June 1993.

	Month												
Village	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Kaktovik*	-	-	1	-	-	-	-	-	-	-	1	1	3[a]
Nuiqsut*	-	-	-	-	-	-	-	-	-	-	-	-	-
Barrow*	1	-	3	5	7	3	3	-	-	2	-	-	24[b]
Atqasuk*	-	-	-	-	-	-	-	-	-	-	-	-	-
Wainwright*	-	-	-	-	3	-	1	-	-	-	3	-	7
Point Lay	-	-	-	-	-	2	-	-	-	-	-	-	2
Point Hope	-	-	-	1	-	4	-	-	5	1	-	-	11
Kivalina	-	-	-	-	-	-	-	-	-	-	-	-	-
Shishmaref	-	-	-	-	-	2	-	1	2	-	-	-	5[c]
Wales	-	-	-	-	-	2	-	-	2	-		-	4
Diomede	-	-	-	-	-	-	2	-	1	1	2	-	6
Savoonga	-	-	-	-	-	-	-	-	-	-	-	-	-
Gambell	-	-	-	-	-	1	-	-	3	-	-	-	4
Totals	1	-	4	6	10	14	6	1	13	4	6	1	66
Percent	(1)	(0)	(6)	(9)	(15)	(21)	(9)	(1)	(19)	(6)	(9)	(1)	(100)

* Denotes villages party to the IGC/NSB Agreement.

[a] Month of kill not available for 1 bear taken in Kaktovik.

[b] Month of kill not available for 1 bear taken in Barrow.

[c] Month of kill not available for 2 bears taken in Shishmaref.

tooth analysis will be reported later. The mean ages for the previous harvest year from July 1, 1991, to June 30, 1992, for males was 11.8 years (N=22, where N represents the number of animals) and for females was 8.9 years (N=11). The primary mode of transportation used to harvest polar bears was snowmachine (83 percent). Other forms of transportation used to harvest polar bears included boats (8 percent) and foot (8 percent).

Polar Bear Management Agreement, Beaufort Sea

The 1992/93 season marked the fifth year of the Polar Bear Management Agreement (Agreement) for the Southern Beaufort Sea between the Inuvialuit Game Council (IGC), Northwest Territories, Canada, and the North Slope Borough (NSB), Alaska. During the reporting period, 36 polar bears were harvested by residents of Kaktovik (4), Barrow (25), and Wainwright (7) [Table 1]. The number of bears harvested by these Alaskan villages party to the Agreement was within the NSB's sustainable yield harvest allocation of 38 animals. Likewise, Canadian hunters harvested fewer bears (34) than their IGC allocation of 38 animals. The reported ratio of male to female bears, as identified on reporting forms, was 74:26. Sex was unknown for five bears harvested during this period.

The quota of 38 bears for each jurisdiction and the 33 percent female harvest proportion has been exceeded only once in the five years that the Agreement has been in effect. Although the sex ratio of the total Alaska harvest from 1988 to 1993 (74:26) is well within the limits set by the Agreement, sex is unavailable for 15 percent of the harvest. Approximately 30 percent of the adults harvested were greater than 10 years old. The mean age for females was 8.3 years and the mean age for males was 7.8 years.

Through the efforts of the NSB Department of Wildlife Management, terms of the Agreement are widely known by hunters from villages under the Agreement. The increased number of polar bear sightings near villages in the past two years will probably continue if populations remain stable and healthy. To protect villagers and prevent increased harvest of problem bears, the NSB conducted bear monitoring programs in Barrow, Kaktovik, Point Lay, and Wainwright. The Service presented the Regional Director's Special Commendation Award to the Mayor and the Department of Wildlife

Management of the NSB, in recognition of their support and actions taken to protect bears and humans, when numerous polar bears gathered in the fall of 1992 near Barrow to feed on the remains of whale carcasses. Two problem bears were captured and removed to remote locations, only to become problems later at Oliktok Point and Barrow where they were killed. Removal of attractants and deterrent programs to prevent bears from getting food should be encouraged due to the costs of translocation and the high potential for translocated bears to become problems elsewhere. As part of an information and education program, efforts continue to be made to inform the public about physical and behavioral modifications that can be taken to minimize bear/human interactions.

Complete sex and age information was available for approximately 40 percent of the harvest from the Alaskan region. Current population data for the southern Beaufort Sea suggests that to maintain a stable population and a harvest of 38 bears per jurisdiction based on sustainable yield, only 4.5 percent of the population, of which 1.5 percent can be female, can be harvested. Although a number of family groups have been harvested in the past five years, the NSB and the Service continue to encourage hunters not to harvest females with cubs, denning bears, or single animals found inland during the den initiation period in the fall. Recommendations to improve the level of reporting compliance, including enforcing the regulation that hides and skulls be presented to a local tagger within 30 days, were discussed.

Review of NBS population data for the southern Beaufort Sea indicates steady population growth since the early 1970's. Population data and estimates are being reanalyzed. There was discussion on the analysis of current population data and the need to revise and continue the mark/recapture program for another 2 to 3 years in order to develop a more accurate population estimate. A decision will follow the reanalysis of the existing data.

Polar Bear Conservation Plan

A draft Conservation Plan for Polar Bear in Alaska was completed in December 1992 and made available for public comment during a 45-day period ending February 28, 1993. Public comments were evaluated during March and a revised draft plan was completed in April 1993. In response to the MMC and concerns from Alaskan Natives, the Conservation Plan has undergone a substantial revision. All options in the Conservation Plan that required amendments to the Act were removed. The part of the Conservation Plan that remains largely intact are the various tasks identified in previous drafts for information needed to carry out the mandates of the Act. In addition to management and research studies, the focus on education and outreach for both the Alaskan Native community and the public at large remains a key feature of these plans. Greater emphasis has been placed on cooperative relationships between the Service and various Alaskan Native organizations that deal with marine mammal conservation.

Under provisions of the Act, final regulations to authorize the incidental, nonlethal take of small numbers of polar bears during oil and gas activities in the Beaufort Sea region (excluding the Arctic National Wildlife Refuge) were published on November 16, 1993, (58 FR 60402), and became effective on December 16, 1993. A provision in the final regulations requires the Service to develop and begin implementation of a Polar Bear Habitat Conservation Strategy (PBHCS) within 18 months of the effective date of the regulations. Protection of habitat is advocated in Article II of the 1973 international Agreement on the Conservation of Polar Bears and language of the Act. An integral part of the PBHCS is the collection of local Native knowledge and scientific information on habitat use by polar bears in Alaska.

International Activities

In October 1992, the Service signed a protocol of intent to develop a Polar Bear Bilateral Management Agreement with the Russian Ministry of Ecology and Natural Resources. Discussions regarding the process, content, and potential effects of a bilateral agreement were undertaken with Alaskan Native organizations during 1993. Following these discussions it was decided that the working group for the bilateral agreement would include representatives from Alaskan Natives and Native groups from northern Russia as well as the U.S. and Russian governments. In addition, it was decided that the Polar Bear Bilateral Management Agreement should: (1) address habitat protection as a key component; (2) be based on sound scientific data on population dynamics, distribution, important habitat areas, harvest statistics, and contaminants; and (3) establish maximum sustainable harvest levels and protocols for establishing harvest guidelines.

Although precise scientific information on the population size and sustainable yields is currently unavailable, the NBS and Service are cooperatively working toward developing a census methodology

for the Chukchi Sea population stock. The survey to test census methodology was rescheduled to June 1994, since anomalous ice conditions prevented completion of work during September and October 1993. The establishment of an Alaska Native Polar Bear Commission will facilitate the development of future conservation agreements and management proposals for the shared stock of polar bears inhabiting the Chukchi, Bering, and Beaufort Seas. Service personnel travelled to Wrangel Island in April and assisted in studies on the survival and dispersal of females from denning areas.

Meetings

A Service representative attended the organizing committee meeting for the Tenth Conference of the International Association for Bear Research and Management to be held in Fairbanks in July 1995. The Service presented several papers at the 11th International Union for the Conservation of Nature and Natural Resources (IUCN) Polar Bear Specialist Group Meeting in Copenhagen, Denmark, in January 1993. The Service participated in the Canadian Federal-Provincial Polar Bear Technical Committee in Winnipeg, Manitoba, Canada, in February 1993. The annual meeting promotes the exchange of information on research and management activities. Two posters on the characteristics of the Alaska polar bear harvest and the Conservation Plan were presented at the Tenth Biennial Conference on the Biology of Marine Mammals in Galveston, Texas, in November 1993. Briefings on polar bear, sea otter, and walrus programs were presented at the Annual Meeting of the Marine Mammal Commission that immediately followed the scientific meeting in Galveston, Texas.

Public meetings on the Conservation Plan were held in Barrow, Point Hope, and Wainwright in January, and in Anchorage, Shishmaref, Wales, and Little Diomede in February. The Conservation Plan and potential Polar Bear Bilateral Agreement were discussed at meetings with Native representatives in Kotzebue in June 1993, and at the Eskimo Walrus Commission Meeting in September 1993.

Following the investigation of a polar bear mauling at Oliktok Point, the Service, Federal and State agency representatives, and private contractors met with representatives from ARCO and BP Exploration to review ways to minimize polar bear/human interactions and discuss safety precautions. The form to record polar bear sightings and bear/human encounters associated with monitoring activities was revised by Service, ADF&G, and NBS personnel, and representatives from ARCO and BP. Efforts are continuing to standardize this form and institute a program to analyze information obtained from this bear monitoring program. Industry representatives have been receptive and helpful in collecting these types of information. The MMS's manual entitled, "Oil and Gas Operations in Polar Bear Habitats," was completed.

A number of informational slide shows on polar bear management activities were presented to school students and residents of rural villages.

Sea Otter-Alaska

Management of sea otters in Alaska involved several major issues in 1993: (1) collaborative work between the U.S. and Russia; (2) development of the Sea Otter Conservation Plan; (3) development of a Memorandum of Agreement between the State of Alaska, the Alaska Sea Otter Commission, and the Service; (4) continuing work on the development of a survey methodology to census sea otters; (5) initial work on a biological sampling program; (6) Exxon Valdez oil spill reports on sea otter injury assessment; and (7) increasing harvest levels of sea otters by Alaskan Natives.

Sea Otter Conservation Plan

A Sea Otter Conservation Plan is being developed to guide future research and management activities on sea otters in Alaska. The first draft conservation plan and a "user-friendly" plan summary were developed in December 1992. Substantive public comment was received throughout 1993. Public meetings were held in villages throughout southeast and southcentral Alaska. Major changes were made during 1993 in response to public comment. These changes included further clarification and increased support for Native involvement in sea otter management and conservation, less emphasis on changes to the Act, and recognition of the role of the NBS in sea otter conservation activities. A final draft Sea Otter Conservation Plan was completed in December 1993 and submitted for a limited review by interested parties. The final plan will be completed in early 1994.

Fourth U.S.-Russia Workshop

The Fourth U.S.-Russia Workshop on Sea Otter Biology was hosted by the Marine Mammals Management Office and the NBS from October 18-22, 1993, in Wasilla, Alaska. Twenty presentations on various aspects of sea otter research and management were presented by workshop attendees.

Participants included 26 U.S. biologists and 7 Russian biologists. A protocol was developed for collaborative work to be conducted in 1994 and 1995.

Memorandum of Agreement

The Service, the ADF&G, and the Alaska Sea Otter Commission (ASOC) worked together throughout 1993 to develop a Memorandum of Agreement (MOA) to help conserve and manage sea otters in Alaska. The agreement is intended to enhance open communication and information exchange, including biological, management, and socioeconomic information among the three organizations. Signing by the three parties is expected in early 1994.

Sea Otter Survey Technique

The Service continued to provide assistance to the NBS in the field testing and evaluation of a sea otter aerial survey methodology designed to correct for biases present in other survey techniques and to provide a reasonably precise and cost-effective method for continuing survey work throughout the State. Service staff participated in field-testing the procedure during the 1993 field season to determine sighting probabilities and inter-observer variation. The results of the 1993 field testing will be used to develop an observer training program and actual field implementation in 1994.

Biological Sampling Program

Preliminary work began on the development of a biological sampling program. The Service, in coordination with the ASOC and the NBS contacted Native hunters to explore the feasibility of getting fresh biological samples from carcasses taken as part of the Native sea otter harvest. Plans are underway to implement a pilot project. Specific objectives of the pilot project are to: (1) assess the feasibility of initiating a long-term biological sampling program; (2) obtain baseline data on the contaminant burden in sea otter tissue; and (3) determine the age and reproductive status of sea otters harvested by Natives. Additional objectives will be carried out through the NBS and the ASOC.

Exxon Valdez Oil Spill

Service staff continued to work on finalizing oil spill damage assessment and restoration reports throughout 1993. Specific projects that the Alaska staff continued involvement with included: (1) evaluation of sea otter first-year survival in oiled and unoiled habitats of Prince William Sound; (2) sea otter foraging behavior and hydrocarbon levels in prey sampled in oiled and unoiled areas of Prince William Sound; and (3) boat-based population surveys of sea otters in Prince William Sound. These reports will be finalized in 1994.

Native Harvest of Sea Otters

In 1993, 1,153 sea otters were reported tagged as part of the Native subsistence harvest. Several villages reported substantial increases in numbers of otters killed compared with the past three years. The increased harvest likely resulted from the increased awareness of the legality of Native sea otter harvest. Products being marketed by Alaskan Natives included hats, gloves, slippers, parkas, and other arts and crafts. Additionally, some Native hunters were exploring the possibility of overseas markets for sea otter products. Without an overseas market, the harvest rate may be exceeding the demand for sea otter products. Many pelts are being saved for future use.

Walrus

Habitat Issues

The Service continued its cooperative work with the ADF&G, the Eskimo Walrus Commission (EWC), the North Pacific Fishery Management Council (NPFMC), and the NMFS on northern Bristol Bay walrus habitat issues. This included the continuation of the seasonal bottomfish fishery closure by the NMFS to prohibit fishing for yellow-fin sole closer than 12 nautical miles to walrus hauling-out sites on the Walrus Islands State Game Sanctuary and at Cape Peirce (Togiak National Wildlife Refuge). This closure was implemented in 1990 because compelling circumstantial evidence indicated that the fishery operations were causing airborne and waterborne acoustic disturbance to walrus, likely contributing to a significant decline in haulout numbers. Ten violations of the fishery closure zone occurred in 1992; substantial fines were assessed in several cases. No violations were recorded by the NMFS in 1993.

Concern about human-caused disturbance to walrus on Round Island (Walrus Islands State Game Sanctuary) led to a Cooperative Agreement in 1993 between the Service and the ADF&G. A behavior study was initiated in 1993 by staff of both agencies and a draft Technical Report entitled, "Round Island Walrus Behavior Study," was produced. The draft document was undergoing review in 1994. During the first season (May to August), preliminary data were collected on walrus behavioral

responses to some types of human disturbances (e.g., small boats, visitors, and aircraft). Similar studies are planned for the 1994 and 1995 seasons to increase sample sizes on Round Island and to expand to other Bristol Bay haulout sites, particularly Cape Peirce, for use in long-term management decisions.

Another issue concerning walrus habitat is a proposal for subsistence hunting of walrus on Round Island. In 1991, the Togiak Traditional Council (TTC) requested a permit from the Alaska Board of Game for access to Round Island to harvest up to 10 male walruses during October. While walrus hunting by Alaskan Natives for subsistence and handicraft purposes is permitted under the Act and is not limited as long as the walrus population is not depleted and the harvest is non-wasteful, the State of Alaska has indirectly prevented hunting at Round Island by restricting access to the island since 1960 when it became part of the Walrus Islands State Game Sanctuary (Sanctuary). The Service has maintained this to be a State access question. A State appointed Task Force (with Service participation) prepared recommendations in 1992 on how hunting should be conducted to minimize disturbance to the walrus population if it was permitted. However, late in 1993 the State denied the TTC's request.

Related to the above subsistence harvest issue, a walrus shooting incident occurred on Round Island in 1993. In June, an ADF&G biologist observed two Alaskan Natives from Togiak firing several shots into a hauled-out group of walrus. The State investigated and cited the two individuals for entering the Sanctuary without a permit and for discharge of a firearm. A hearing was still pending at the end of 1993.

Walrus Conservation Plan

The Service began to develop a long range Walrus Management Plan in 1989. A planning team comprised of a broad spectrum of interested parties and walrus experts developed a draft outline for the plan and a preliminary task schedule for completing the plan. Progress on the plan was delayed due to other higher priority tasks in 1990 and 1991 (e.g., the Exxon Valdez oil spill, the 1990 US-USSR population survey). The Service, with the assistance of the MMC and the EWC, made substantial progress in 1992 with a Draft Plan and an Executive Summary (a brief synopsis) being completed and distributed for public comment in January 1993. Meetings to discuss the Draft Plan were held in six coastal villages in northwestern Alaska and Anchorage in early 1993. Considerable feedback from the Draft Plan and the Executive Summary was received. These comments were considered and many of them incorporated into a Draft Final Management Plan released for additional public comment in April 1993. Unresolved public concerns led to preparation of a revised draft Final Conservation Plan, advocating a more cooperative approach to management based on the Act as it now stands, without proposed amendments. The revised draft was issued in late December 1993 for a limited review. A final Walrus Conservation Plan was issued in June 1994.

Harvest Monitoring

The Service has monitored the spring walrus harvest in six villages in the Bering Sea since 1979, with the exception of 1990 and 1991 due to a lack of funds. A revised and more cooperative program was initiated in the spring of 1992 in four villages. The program monitors the level of harvest and collects life history data (age, reproductive condition, contaminant, and other samples) to provide management agencies, hunters, and conservation organizations with information about how the harvest might affect the walrus population. Because Service biologists are stationed in the villages during the harvest season, biological samples can be collected which cannot be collected through the Marking, Tagging, and Reporting Program (MTRP). The 1993 Walrus Harvest Monitoring Program (WHMP) followed the policies of 1992 which included: (1) hiring and training of Native people to work as Village Monitors participating with Service biologists in the collection of data; (2) requesting Native hunters to voluntarily provide samples (teeth, reproductive tracts) from all walrus harvested; and (3) a commitment by the Service to analyze samples and report results back to Native users prior to the next harvest season so that hunters could use the information to make informed decisions about the level and structure of the upcoming harvest. Hunter participation in 1993, the second year of the revised WHMP, was encouraging with teeth being provided from about 30 percent of the non-calf harvest. Additional help will be solicited to increase the sample size of reproductive data; reproductive tracts were provided from only about 17 percent of the females taken in the villages monitored [Table 3]. The program is scheduled to continue at the four villages in 1994.

The reported 1993 spring walrus harvest at the four villages was 726 animals [Table 4]. This compares to the State-wide, year-round total of 1,007 animals as reported through the MTRP. Contributing factors to the low harvest numbers in 1993 compared to previous years were early ice break-up and the

Table 3. Summary of 1993 Samples Contributed By Hunters In Four Villages Participating In The Walrus Harvest Monitoring Program In Northwestern Alaska. Percentages of Totals Shown In Parentheses.

Village	Total Adults[a]	Teeth Samples	Adult Females[b]	Female Reproductive System Samples
Gambell	385	75 (19.5)[c]	231	20 (8.7)
Savoonga	151[d]	102 (67.5)[e]	12	5 (41.7)
Diomede	83	39 (46.0)	61	21 (34.4)
Wales	15	5 (33.3)	10	0[f]
Totals	634	221 (35.4)	314	46 (14.7)[g]

[a] Includes subadults but not calves and yearlings.
[b] Adult females does not include yearlings or calves.
[c] About 63 percent of the tooth samples were taken from jaws provided by hunters.
[d] Does not include an estimated 49 walrus reported taken at camps.
[e] About 17 percent of the tooth samples were taken from jaws provided by hunters.
[f] Reproductive system samples were not requested from Wales hunters.
[g] Percent calculation excludes Wales females.

Table 4. Summary of 1993 Spring Harvest of Four Villages Participating In The Walrus Harvest Monitoring Program In Northwestern Alaska. Percentages of Totals Shown In Parentheses.

Village	Males	Females	Calves	Unknown	Total
Gambell	146 (31.7)	239 (51.8)	67 (14.5)	9 (2.0)	461
Savoonga	139 (89.7)	12 (7.7)	3 (1.9)	1 (0.6)	155[a]
Diomede	22 (23.7)	61 (65.6)	6 (6.5)	4 (4.3)	93
Wales	5 (29.4)	10 (58.8)	1 (5.9)	1 (5.9)	17
Totals	312 (43.0)	322 (44.4)	77 (10.6)	15 (2.1)	726

[a] Does not include an estimated 49 walrus reported taken at camps.

fact that many hunters were whaling longer than usual and were therefore not hunting walrus.

Contaminants Monitoring

In May 1993, the Service issued a Technical Report (#R/7-MMM 93-1) presenting results of a continuing study to monitor levels of heavy metals in the tissues of Pacific walrus harvested in the spring by Alaskan Natives. Analyses for metals and metalloids were conducted on 50 kidneys and 53 livers collected from 1986-1989 in Gambell, Savoonga, and Diomede. Mean cadmium concentrations (kidney – 166.5 mg/kg dry wt., liver—27.6 mg/kg dry wt.) were not significantly higher than previously reported for walrus although they continued to exceed levels thought by the Environmental Protection Agency to interfere with organ function in domestic animals. Mean mercury concentrations (liver—4.17 mg/kg dry wt., kidney – 1.10 mg/kg dry wt.) were not found to be significantly higher than reported previously. It is uncertain what these results mean to the health of walrus. This report was forwarded to the State of Alaska's Division of Public Health for review. Their conclusion was that the Division "continues to recommend no restrictions on consumption of walrus…."

To continue the monitoring study and to begin to address the question of what these contaminant levels mean to walrus organ function, approximately 50 paired samples for both contaminant and histopathology analyses were collected through the 1993 walrus harvest monitoring program (similar samples were taken in 1992). These samples have been archived for future analysis.

An additional 220 liver and kidney samples were taken from Pacific walruses during the 1991 joint

Table 5. Villages With MTRP Taggers and Species Tagged.

Village	Species*	Village	Species*	Village	Species*
Adak	SO	Kake	SO	Platinum	W
Akhiok	SO	Kaktovik	PB/W	Point Hope	PB/W
Akutan	SO	Karluk	SO	Point Lay	PB/W
Anchorage	SO/PB/W	Kenai	SO/W	Port Graham	SO
Angoon	SO	Ketchikan	SO/W	Port Heiden	SO/W
Atka	SO	King Cove	SO	Port Lions	SO
Barrow	PB/W	King Island	W	Quinhagak	W
Bethel	SO/W	King Salmon	SO/W	Sand Point	SO/W
Brevig Mission	W	Kipnuk	W	Savoonga	PB/W
Chefornak	W	Kivalina	PB/W	Seldovia	SO
Chenega Bay	SO	Klawock	SO	Seward	SO
Chevak	W	Kodiak	SO/W	Shishmaref	PB/W
Chignik	SO	Kongiganak	W	Sitka	SO/W
Clarks Point	W	Kotzebue	PB/W	St. George	W
Cold Bay	SO/W	Koyuk	W	St. Paul	SO/W
Cordova	SO/W	Kwigillingok	W	Stebbins	W
Dillingham	SO/W	Larsen Bay	SO	Tatitlek	SO
Egegik	SO/W	Little Diomede	PB/W	Teller	PB/W
Elim	W	Manokotak	W	Togiak	W
Emmonak	W	Mekoryuk	W	Tooksook Bay	W
English Bay	SO	Naknek	W	Tuntutuliak	W
Fairbanks	SO/PB/W	Newtok	W	Tununak	W
Gambell	PB/W	Nightmute	W	Unalakleet	W
Golovin	W	Nikolski	SO	Unalaska	SO/W
Goodnews Bay	W	Nome	PB/W	Valdez	SO
Homer	SO/W	Nuiqsut	PB	Wainwright	PB/W
Hoonah	SO	Old Harbor	SO	Wales	PB/W
Hooper Bay	W	Ouzinkie	SO	Wrangell	SO
Hydaburg	SO	Perryville	SO/W	Yakutat	SO
Juneau	SO/W	Pilot Point	SO/W		

* Species Key: SO = Sea Otter PB = Polar Bear W = Walrus

For names, addresses, and telephone numbers of village taggers, contact the U.S. Fish and Wildlife Service, Office of Marine Mammals Management, Marking, Tagging, and Reporting Program, 1011 East Tudor Road, Anchorage, Alaska 99503. Telephone: (800) 362-5148.

U.S.-Russia research cruise. Laboratory analysis for heavy metals (including methyl mercury) and metalloids were completed for these samples in 1993. A report summarizing these results will be submitted for presentation at the Arctic Science Conference to be held jointly in Vladivostok, Russia, and Anchorage, Alaska, in August 1994.

International Activities

The 12th meeting of the U.S.-Russia Marine Mammal Working Group was held in Anchorage, Alaska, from December 6-10, 1993. A Protocol was completed which includes proposed scientific exchanges for the next one to two years. The 1994 proposals were to be finalized in early 1994 as part of the general

protocol under the U.S.-Russia Environmental Protection Agreement. Both sides agreed on the need for a meeting to discuss issues related to the cooperative walrus population surveys that have been conducted at 5-year intervals, starting in 1975 and the feasibility of a survey in 1995. It was agreed that alternative indices of population status and trends need to be considered. Both sides agreed on the need to initiate discussion of a Bilateral Walrus Conservation Agreement that would address issues regarding walrus research, management, and enforcement. An initial meeting date will be determined by the second quarter of 1994.

Marking, Tagging, and Reporting Program

The Marking, Tagging, and Reporting Program (MTRP) was established in October 1988 to monitor the subsistence harvest of polar bear, sea otter, and walrus by coastal Alaskan Native people. The MTRP collects biological information from the harvest and assists in controlling illegal activities in specified marine mammal parts. During 1993, the Marine Mammals Management Office's MTRP staff traveled to 77 coastal villages to hold village meetings, hire and replace taggers, provide training, and

Table 6. Sea Otters Tagged, By Tagging Location and Calendar Year.*

Location	Pre-Rule	1988	1989	1990	1991	1992	1993	Totals
Adak	0	0	0	0	0	4	0	4
Akutan	0	0	0	0	0	1	10	11
Akhiok	1	0	0	0	0	0	0	1
Anchorage	117	2	37	11	8	25	9	209
Bethel	4	0	0	0	1	0	0	5
Chignik	1	0	9	5	0	0	0	15
Cordova	31	0	12	9	39	13	50	154
Cold Bay	0	0	0	1	0	0	5	6
English Bay	0	0	0	0	0	0	17	17
Fairbanks	0	0	0	0	0	0	2	2
Homer	18	22	9	9	0	0	25	83
Hoonah	0	0	0	0	0	51	230	281
Juneau	10	0	1	26	0	14	21	72
Kenai	0	0	8	6	33	0	0	47
Ketchikan	2	0	0	0	0	194	73	269
King Cove	8	0	0	25	0	8	1	42
King Salmon	0	0	0	0	0	0	1	1
Klawock	57	3	119	10	74	4	220	487
Kodiak	157	0	31	16	5	25	118	352
Larsen Bay	31	0	0	0	17	14	2	64
Mekoryuk	5	0	0	0	0	0	0	5
Ouzinkie	0	0	0	0	0	0	29	29
Perryville	0	0	0	0	0	2	2	4
Pilot Point	1	0	0	0	0	0	0	1
Port Graham	0	3	0	0	1	6	6	16
Port Heiden	1	0	5	0	0	1	0	7
Port Lions	11	0	0	1	0	0	0	12
Sand Point	0	0	1	0	0	0	0	1
Seldovia	0	0	1	0	0	12	20	33
Sitka	44	25	35	47	39	163	146	499
Tatitlek	0	0	0	0	19	27	3	49
Unalaska	0	0	0	0	0	0	5	5
Valdez	0	0	0	0	0	72	102	175
Wrangell	0	0	0	0	0	0	21	21
Totals	499	55	268	166	236	637	1,153	3,014

* Revised February 16, 1994.

Table 7. Sea Otters Tagged By Age, Class, Sex, and Year.*

	Pre-Rule	1988	1989	1990	1991	1992	1993	Total
Adults								
Male	230	44	176	120	149	367	523	1,609
Female	88	9	35	15	44	173	405	769
Unknown	121	0	19	2	23	15	35	215
Subtotal	439	53	230	137	216	555	963	2,593
Subadults								
Male	8	1	15	16	3	35	72	150
Female	8	1	2	9	5	25	54	104
Unknown	14	0	3	0	3	6	4	30
Subtotal	30	2	20	25	11	66	130	284
Pups								
Male	1	0	1	3	0	6	6	17
Female	0	0	0	1	1	5	3	10
Unknown	6	0	1	0	6	2	2	17
Subtotal	7	0	2	4	7	13	11	44
Unknown								
Male	0	0	1	0	2	1	0	4
Female	0	0	1	0	0	1	7	9
Unknown	23	0	14	0	0	1	42	80
Subtotal	23	0	16	0	2	3	49	93
All Ages								
Male	239	45	193	139	154	409	601	1780
Female	96	10	38	25	50	204	469	892
Unknown	164	0	37	2	32	24	83	342
Grand Total	499	55	268	166	236	637	1,153	3,014

* Revised February 16, 1994.

work with hunters to gain better compliance with MTRP regulations. To help inform village residents of these regulations, 21 school presentations were made during the village visits. The MTRP staff hired or replaced 26 taggers and added 6 new villages to the program.

The MTRP currently has 110 taggers and 45 alternates located in 89 villages throughout coastal Alaska [Table 5]. Usually, local Native residents are hired and trained to tag polar bear and sea otter hides and skulls and walrus tusks in the villages where they live. The MTRP employs 48 sea otter, 17 polar bear, and 66 walrus taggers. A few taggers tag more than one species in villages where the harvest numbers are low. Numbered, color coded, locking tags are placed on all polar bear and sea otter skulls and skins presented for tagging. Premolar teeth are extracted for aging purposes from each bear and otter skull. A lead headed wire tag is attached through a hole drilled in the root section of each walrus tusk tagged and a liquid marker is applied to two sides of the tusk. Tag numbers, location and date of tagging, place of kill or find, sex, age, and measurements of specified parts are recorded by the tagger. Harvest data were reported from 65 villages during 1993.

Twenty seven sea otter taggers reported 1,153 otters being tagged in 1993 with several villages reporting substantial increases in numbers of otters killed compared with the past three years [Tables 6, 7, and 12]. The increased harvest resulted from increased awareness of the legality of hunting sea otters. Sea otter hides are used to make hats, gloves, slippers, blankets, and other arts and crafts. A few hunters trade sea otter hides for walrus ivory, polar bear and seal skins, or other items that are used in making crafts. Compliance with the tagging regulation by sea otter hunters appears to be high.

Sixty polar bears were tagged in 9 villages during the 1992-93 hunting season [Tables 8, 9, and 12]. During the last three years, the total number of

bears tagged decreased. Compliance with the tagging rule appears to be good.

Twenty nine walrus taggers reported tagging 1,007 walrus in 1993. Walrus tusks sometimes become separated before they are tagged. In order to accurately account for the harvest, a weight factor variable is added that interprets each record in terms of take. Estimation of the total harvest is made by summing this weight factor. Walrus records where only a single tusk was tagged is given a weight factor of 0.5, because the possibility exists that the second tusk may be tagged at a later date. For analytical purposes, the lower estimate is calculated with the assumption that single-tusk records in the database represent half of one walrus. The upper estimate is calculated assuming that each record represents a whole walrus. If all walrus tusks are tagged as pairs, the upper and lower bounds are equal. As a conservative approach to management, the upper estimate is considered to be the actual figure for the walrus harvest [Tables 10, 11, and 12].

A comprehensive review of the MTRP's first four years of operation was completed in 1993 and will be distributed in 1994. The report examines all aspects of the program from implementation strategies to the present status.

An extensive data base check was concluded in 1993 to ensure the accuracy of all MTRP data entries.

A new type of Ultra-Violet marking fluid is now used to mark walrus ivory for village identification. The previous type of fluid was found to be unreliable and its use was terminated. The new fluid allows field identification of a village code without having to send the ivory to a laboratory for identification.

The use of additional "beach taggers" was tried during the 1993 spring hunt in Gambell, Savoonga, and Little Diomede. This was intended to assist the hunters in getting their tusks tagged immediately upon return to their villages. In most cases it was not possible to tag the tusks because they were still in the skull when the hunters returned. Also it was difficult to insure that a tagger would be available

Table 8. Polar Bears Tagged, By Tagging Location and Harvest Year [a] [b]

Location	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	Total
Anchorage	2	0	3	4	4	0	0	13
Barrow	12	31	14	14	22	23	11	127
Brevig Mission	0	0	1	0	0	0	0	1
Fairbanks	1	0	0	0	0	0	0	1
Gambell	25	13	10	11	4	4	16	83
Kaktovik	6	8	0	0	0	2	5	21
Kivalina	5	1	5	3	2	0	0	16
Kotzebue	0	0	4	0	0	0	0	4
Little Diomede	15	9	6	3	6	6	0	45
Nome	3	0	1	0	0	0	0	4
Nuiqsut	3	2	0	0	0	0	3	8
Point Hope	9	8	22	14	7	11	0	71
Point Lay	2	2	0	0	0	2	0	6
Savoonga	13	13	9	12	6	0	0	53
Shishmaref	13	23	14	6	3	5	1	65
Wainwright	9	13	7	6	3	4	5	47
Wales	5	9	3	3	2	3	0	25
Total	123	132	99	76	59	60	41	590

[a] Harvest year is from July 1 to June 30 of the following year.
[b] Revised February 16, 1994.

Table 9. Polar Bears Tagged By Age, Class, Sex, and Harvest Year.[a b]

	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	Total
Adults								
Male	12	5	29	41	25	21	11	144
Female	8	3	12	6	5	11	6	51
Unknown	0	0	0	0	0	2	1	3
Subtotal	20	8	41	47	30	34	18	198
Subadults								
Male	1	2	27	13	12	13	12	80
Female	0	0	7	6	13	1	1	28
Unknown	0	1	0	0	0	1	1	3
Subtotal	1	3	34	19	25	15	14	111
Cubs								
Male	2	0	4	2	1	5	6	20
Female	0	0	2	0	0	2	1	5
Unknown	0	0	0	0	0	2	1	3
Subtotal	2	0	6	2	1	9	8	28
Unknown								
Male	58	78	6	5	0	2	0	149
Female	39	31	1	1	3	0	0	75
Unknown	3	12	11	2	0	0	1	29
Subtotal	100	121	18	8	3	2	1	253
All Age Classes								
Male	73	85	66	61	38	41	29	393
Female	47	34	22	13	21	14	8	159
Unknown	3	13	11	2	0	5	4	38
Grand Total	123	132	99	76	59	60	41	590

[a] Harvest year is from July 1 to June 30 of the following year.
[b] Revised February 16, 1994.

on the beach at all times of the night and day. While the beach tagging was not successful, having additional taggers in the villages made it easier for hunters to get their ivory tagged at a later date.

Hunter success varied greatly from village to village and between hunters. Many hunters reported poor weather and marginal ice conditions during the walrus migration. Often the villagers could hear or even see the walrus, but because of unfavorable ice conditions hunters were unable to get close to them.

Compliance with the MTRP regulations by walrus hunters needs improvement, despite an aggressive campaign by the MTRP staff and Service Law Enforcement agents to increase compliance. Village meetings, radio and newspaper announcements, letters, and posters were utilized to encourage the hunters in all villages to have every kill recorded. The most common reason for ivory not being tagged was that hunters carve their own harvested ivory. Some hunters do not see the use of tagging their ivory if they are going to use it themselves. When raw ivory was sold to the village store, compliance with the rule was high.

Assessment of compliance is subjectively based on personal observation and discussions with village taggers and others. The Service has not determined a feasible way to quantify the levels of compliance. Enforcement of the MTRP regulation has been limited to only a few cases and those were related to other enforcement actions. However, information from the MTRP data base was valuable in several enforcement actions in 1993. In most cases, enforcement has had a positive effect and heightened awareness. However, in at least one instance, village enforcement action resulted in resistance and some of the information that the MTRP was receiving is no longer offered by the hunters.

Table 10. Walrus Harvest Estimate, From MTRP Data, By Tagging Location and Year.*

Location	Pre-Rule	1988	1989	1990	1991	1992	1993	Totals
Anchorage	289	0	37	19	19	0	0	364
Barrow	1	1	9	7	23	21	18	80
Bethel	12	0	10	15	15	21	10	83
Brevig Mission	3	0	0	6	1	24	4	38
Chevak	11	0	2	1	2	4	4	24
Clarks Point	8	0	1	0	14	5	0	28
Cordova	13	0	0	0	0	0	0	13
Cold Bay	0	0	0	0	0	1	1	2
Dillingham	25	0	10	15	5	8	1	64
Egegik	0	0	0	0	0	1	0	1
Elim	0	0	0	3	4	0	1	8
Emmonak	0	0	0	0	0	0	1	1
Fairbanks	9	0	2	0	0	0	2	13
Gambell	12	4	188	756	629	403	440	2,432
Golovin	1	0	0	0	1	3	0	5
Goodnews Bay	4	0	2	1	1	0	0	8
Homer	0	0	0	0	2	2	2	6
Hooper Bay	3	0	1	14	5	3	0	26
Kaktovik	0	0	0	0	0	0	1	1
Kenai	2	0	0	0	0	0	0	2
Ketchikan	1	0	0	0	0	0	0	1
Kivalina	0	0	46	0	0	1	0	47
King Island	1	0	0	7	77	346	28	459
King Salmon	2	0	0	1	3	2	1	9
Kipnuk	3	0	0	3	0	1	0	7
Kodiak	2	0	0	0	0	0	0	2
Kongiganak	0	0	3	0	3	3	0	9
Kotzebue	30	0	0	0	3	0	0	33
Koyuk	0	0	0	2	5	0	0	7
Kwigillingok	0	0	0	0	1	5	0	6
Little Diomede	0	0	1	236	532	83	82	934
Manokotak	3	0	1	0	0	0	0	4
Mekoryuk	23	0	4	14	49	19	14	123
Naknek	1	0	0	3	1	1	0	6
Nome	48	0	1	15	39	13	10	126
Perryville	0	0	1	0	0	0	0	1
Pilot Point	0	0	0	0	1	0	0	1
Platinum	20	0	9	5	2	10	3	49
Point Hope	3	0	2	5	0	5	5	20
Port Heiden	5	0	0	0	2	4	5	16
Quinhagak	0	0	0	0	3	0	0	3
St. George	1	0	0	1	1	0	0	3
St. Paul	0	0	0	0	1	1	5	7
Sand Point	1	0	0	1	2	0	0	44
Savoonga	418	0	221	198	520	542	251	2,150
Shishmaref	490	0	122	87	35	69	34	837
Sitka	15	0	0	0	6	0	0	21
Stebbins	0	0	1	5	17	0	8	31
Teller	0	0	0	0	0	3	11	14
Togiak	12	1	9	25	6	6	21	80
Tooksook Bay	0	0	0	0	2	0	0	2
Tuntutuliak	0	0	0	0	0	0	1	1
Unalakleet	6	0	1	5	5	0	0	17
Wainwright	4	0	43	0	32	33	40	152
Wales	10	0	10	10	86	15	2	133
Total	1,492	6	737	1,459	2,155	1,657	1,007	8,514

* Revised February 16, 1994.

Table 11. Walrus Harvest Estimate, From MTRP Data, By Age, Class, Sex, and Year.*

	Pre-Rule	1988	1989	1990	1991	1992	1993	Total
Adults								
Male	583	6	349	512	870	687	486	3,493
Female	227	0	213	529	899	728	389	2,985
Unknown	580	0	151	53	59	100	66	1,009
Subtotal	1,390	6	713	1,094	1,828	1,515	941	7,487
Subadults								
Male	24	0	6	21	39	51	16	157
Female	5	0	2	4	16	7	5	39
Unknown	39	0	3	8	6	6	8	70
Subtotal	68	0	11	33	61	64	28	266
Calves								
Male	0	0	0	0	58	1	3	62
Female	0	0	0	0	61	0	2	63
Unknown	1	0	4	331	144	74	31	585
Subtotal	1	0	4	331	263	75	36	710
Unknown								
Male	1	0	1	1	0	0	0	3
Female	0	0	1	0	0	0	0	1
Unknown	32	0	7	0	3	4	1	47
Subtotal	33	0	9	1	3	4	1	51
All Ages								
Male	609	6	356	534	967	739	505	3,715
Female	232	0	216	533	976	734	396	3,088
Unknown	652	0	165	392	212	184	106	1,711
Grand Total	1,492	6	737	1,459	2,155	1,657	1,007	8,514

* Revised February 16, 1994.

Success of the MTRP depends on a village presence by the Service and routine contacts with taggers. Staff will continue to hold village meetings, train and retrain taggers as necessary, work with Native leaders and organizations, and expand the use of informational and educational materials that relate to the MTRP and other marine mammal issues. Because of the extensive exposure of the MTRP staff throughout coastal Alaska, these personnel are often called upon by other Service programs that need an introduction to, or assistance working in, a village. The MTRP staff will continue to provide information that is obtainable only by being acquainted with the residents of the remote villages and familiarity with the traditional village life.

An informal quarterly newsletter will continue to be distributed to all taggers and other interested people. The newsletter has proven to be valuable tool in disseminating pertinent information in a timely manner to a State-wide audience.

Incidental (Small) Take During Oil and Gas Exploration

The Act authorizes the Secretary of the Interior to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals in a specified activity within a specified geographical region if it is found that the total of such taking will have a negligible impact on the species or stock and will not have an unmitigable adverse impact on the availability of such species or stock for subsistence uses. General implementing regulations in the Code of Federal Regulations (at 50 CFR 18.27) provide for development of specific regulations to govern incidental take activities and for issuance of Letters of Authorization (LOA) to applicants proposing to conduct activities under the specific regulations. Regulations can be issued for a period of not more than five consecutive years. LOAs prescribe specific

Table 12. MTRP Tagging Data, By Year With All Villages Combined.

Sea Otters[a]							
Pre-Rule[b]	1988[c]	1989	1990	1991	1992	1993[d]	Total
499	55	268	166	236	637	1,153	3,041
Polar Bears[e]							
Pre-Rule[b]	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94[d]	Total
123	132	99	76	59	60	41	590
Walrus[a]							
Pre-Rule[b]	1988[c]	1989	1990	1991	1992	1993[d]	Total
1,492	6	737	1,459	2,155	1,657	1,007	8,514

[a] Harvested by calendar year, January 1 to December 31.
[b] Harvested before October 26, 1988.
[c] Harvested between October 26 and December 31, 1988.
[d] Preliminary data. Revised February 16, 1994.
[e] Harvested by harvest year—July 1 to June 30 of the following year.

stipulations for each applicant and must be renewed annually.

On December 17, 1991, BP Exploration (Alaska), Inc., for itself and on behalf of Amerada Hess Corporation, Amoco Production Company, ARCO Alaska, Inc., CGG American Service, Inc., Conoco Inc., Digicon Geophysical Corp., Exxon Corporation, GECO Geophysical Co., Halliburton Geophysical Services, Inc., Mobil Oil Corporation, Northern Geophysical of America, Texaco Inc., Unocal Corporation, and Western Geophysical Company, petitioned the Service for the promulgation of regulations. The petition sought regulations which would allow incidental, but not intentional, take of small numbers of: (1) polar bear and walrus in the course of oil and gas exploration activities during the open-water season in State waters and on the Outer Continental Shelf (OCS) in the Beaufort Sea adjacent to the coast of Alaska; (2) polar bears in the course of oil and gas exploration activities in arctic Alaska (onshore and offshore) during the ice-covered period of the year; and (3) polar bear and walrus in the course of oil and gas development and production activities and associated vessel operations in arctic Alaska on a year-round basis.

The Service reviewed the petition and prepared a draft environmental assessment in conjunction with the proposed rule. The three part petition was combined into one action which proposed regulations that would authorize for five years the incidental, unintentional take, of small numbers of polar bear and walrus during oil and gas industry exploration, development, and production activities year-round in the Beaufort Sea and adjacent northern coast of Alaska. The coastal area of the Arctic National Wildlife Refuge was excluded from the petition, and subsequent regulations. The environmental review process led the Service to propose the finding that the projected takings would have a negligible impact on the species or stocks and would not have an unmitigable adverse impact on the availability of such species or stocks for subsistence uses.

On December 30, 1992, the Service published in the Federal Register (57 FR 62283) a proposed rule, notice of public meetings, and request for comments on the BP Exploration (Alaska) Inc. petition. Public meetings were held at four Alaska locations; Anchorage, Barrow, Nuiqsut, and Kaktovik (Barter Island), and a 75-day comment period ended on March 15, 1993.

On November 16, 1993, the final rule was published in the Federal Register (58 FR 60402) and became effective on December 16, 1993. The regulations allow the issuance of LOAs to allow the incidental, unintentional take of polar bear and walrus in the Beaufort Sea and on the northern coast of Alaska.

In response to public comment, and to more fully meet the intent of Article II of the international 1973 Agreement on the Conservation of Polar Bears, the final regulations were issued with an

initial effective period of 18 months (through June 16, 1995) instead of a 5 year period as contained in the proposed rule. For the effective period of the regulations to be extended an additional 42 months beyond the initial 18 month period (for a total of 5 years), the final regulations contained provisions requiring the Service to develop and begin implementing a Polar Bear Habitat Conservation Strategy by June 16, 1995.

In response to requests for LOAs, the following authorizations have been issued in accordance with the Service's final rule of November 16, 1993, identified above:

Company	Activity	Date Issued	Expiration Date
Schlumberger Geco-Prakla	exploration	Jan 10, 1994	Jun 30, 1994
Amerada Hess Corporation	exploration	Jan 10, 1994	Aug 31, 1994
BP Exploration (Alaska) Inc.	exploration	Jan 13, 1994	Jun 30, 1994
BP Exploration (Alaska) Inc.	exploration	Jan 13, 1994	Jun 30, 1994
BP Exploration (Alaska) Inc.	exploration development production	Jan 13, 1994	Jun 16, 1995
Western Geophysical	exploration	Jan 13, 1994	Jun 30, 1994
BP Exploration (Alaska) Inc.	exploration development production	Jan 18, 1994	Jun 16, 1995
ARCO Alaska, Inc.	exploration production development	Jan 18, 1994	Jun 16, 1995
ARCO Alaska, Inc.	exploration	Jan 19, 1994	Mar 01, 1994
ARCO Alaska, Inc.	exploration	Jan 21, 1994	Apr 30, 1994
ARCO Alaska, Inc.	exploration	Jan 21, 1994	May 01, 1994
ARCO Alaska, Inc.	exploration	Jan 21, 1994	May 31, 1994
BP Exploration (Alaska) Inc.	exploration	Feb 08, 1994	Jun 16, 1995

In 1993, no LOAs were issued under the Chukchi Sea regulations that were implemented June 14, 1991, for the incidental take of small numbers of walruses and polar bears during open water exploration for oil and gas in the Chukchi Sea adjacent to the coast of Alaska.

Sea Otter-Southern

The southern sea otter (Enhydra lutris nereis) in California is an extant population of the species that once ranged throughout the northern and eastern Pacific Coast. In the mid-1700's, the sea otter was recognized as a valuable fur-bearing animal, and commercial exploitation began. The historical population in California is estimated to have been 16,000-18,000 individuals. By 1910, the species had been virtually exterminated from its entire range except for remnant populations in Russia, Alaska, the Queen Charlotte Islands in British Columbia, Canada, central California, and the San Benito Islands in Baja California, Mexico. Even though the International Fur Seal Treaty of 1911 promoted protection of sea otters on the high seas, by 1920 the British Columbia and Baja populations were also extirpated.

In 1913, the California State Legislature protected the sea otter from exploitation, although there were apparently very few sea otters left in California. Those that survived were probably concentrated in the Point Sur area. In 1938, 50 otters were noted at Bixby Creek in Monterey County, just north of Point Sur.

Fully protected against take, the population subsequently grew in number and range. By 1970 the population had become reestablished in about 10 percent of its historic California range. However, between the early 1970's and mid- 1980's, little or no growth in numbers was observed, although the range expanded somewhat. In 1977 the southern sea otter, already afforded the protection of the Act, was listed as a threatened species under the authority of the ESA. The sea otter's physiological vulnerability to oil

and greatly reduced population size and distribution, combined with threats of oil spills resulting from increasing tanker traffic near the central coast, were the primary reasons for the southern sea otter listing.

The California Department of Fish and Game (CDF&G) and the Service again conducted a spring and fall survey in 1993. The area surveyed included the entire 220-mile long established range of the southern sea otter population, from Point Ano Nuevo in Santa Cruz County to the Santa Maria River in San Luis Obispo County, plus additional peripheral habitat. The total number of otters counted during the spring 1993 survey was higher than any since these counts began [Table 13]. As a rule, fall counts are consistently lower than spring counts. This may be due to the fact that sea otters are more difficult to observe in the fall owing to their increased dispersal throughout the range, and

Table 13. Comparison Of Southern Sea Otter Counts Conducted Since The Spring Of 1982.[a]

Season	Number Of Independent Otters	Number Of Pups	Total
1982 Spring	1,124	222	1,346
Fall	1,204	147	1,351
1983 Spring	1,156	121	1,277
Fall	1,060	163	1,223
1984 Spring	1,180	123	1,303
Spring[b]	1,151	52	1,203
Fall	No survey		
1985 Spring	1,119	242	1,361
Fall	1,065	150	1,215
1986 Winter[c]	1,231	181	1,412
Spring	1,358	228	1,586
Fall	1,091	113	1,204
1987 Spring	1,435	226	1,661
Fall	1,260	110	1,370
1988 Spring	1,504	221	1,725
Fall	No survey		
1989 Spring	1,571	285	1,856
Fall	1,492	115	1,607
1990 Spring	1,466	214	1,680
Fall	1,516	120	1,636
1991 Spring	1,700	241	1,941
Fall	1,523	138	1,661
1992 Spring	1,810	291	2,101
Fall	1,581	134	1,715
1993 Spring	2,022	217	2,239
Fall	1,662	143	1,805

[a] In 1992, all survey data since Fall 1982 was reviewed and counts were corrected as appropriate.
[b] California Department of Fish and Game aerial survey with ground truth stations.
[c] Experimental.

to the greater abundance of bull kelp during the fall which obscures detectability of otters. In the spring, the giant kelp is more clumped and there is little bull kelp to contend with; therefore, the otters are easier to count. Most otters are found between Ano Nuevo and Avila Beach.

Translocation of Southern Sea Otters

Translocation of southern sea otters to establish a second breeding colony was initiated in 1987. The purposes for establishing a second colony were two-fold: (1) to eliminate the possibility that more than a small proportion of the population would be decimated by any single natural or human-caused catastrophe; and (2) to obtain data for assessing translocation and containment techniques, population status, and the influence of sea otters on the structure and dynamics of the near shore community. The latter information is particularly important in attempting to understand the characteristics and impacts of a sea otter population at its optimum sustainable population level as required by the Act.

Public Law 99-625 provides the authority and establishes the guidelines for carrying out the translocation program. A Final Environmental Impact Statement and rulemaking were distributed by the Service in May 1987. The final rule establishes the boundaries of a Translocation Zone to which otters would be translocated and given protection similar to that of the parent population, and a Management Zone to be maintained otter-free by non-lethal means. The Translocation Zone consists of San Nicolas Island (SNI) and surrounding waters in the Southern California Bight, ranging from 10-19 nautical miles from the 15-fathom contour surrounding SNI. The Management Zone must surround the Translocation Zone separating it from the parent population, yet not infringe upon habitat necessary for recovery of the southern sea otter. The Management Zone includes the remainder of the Southern California Bight south of Point Conception, including the other offshore islands and mainland coast. As such, it implements a significant form of zonal management, as recommended by the MMC in 1980.

Analysis of data obtained during the initial year of translocation provided some insight into factors that are apparently necessary for successful translocation. Translocation strategy changed in line with this information. These changes were discussed in the Service's 1988 Annual Report to Congress. We have learned that the probability of sea otters being lost from the experimental population from either mortality or emigration is high. Analysis of the available data on loss rates of translocated sea otters indicates that the loss rates for juvenile and adult animals are similar. The survivorship of both age classes is such that there is a very low likelihood of a sufficient number of juveniles remaining at SNI long enough to attain sexual maturity. Based on the available data, adults or females with dependent pups must form the nucleus of a successfully breeding colony at SNI. This information has been reviewed by biologists from the Service's sea otter research program and the sea otter recovery program, the Sea Otter Recovery Team, the CDF&G's sea otter program, the NMFS, and staff of the MMC. All concur with the finding and conclusion. In fact, this appears to be similar to the initial growth patterns of the translocated populations of sea otters to Vancouver Island, Canada, and Washington. These reintroductions initially declined to very low numbers from which the populations increased and today number in the hundreds and appear to be established.

During the transplant period (1987-1990) 139 sea otters were translocated to SNI. No otters were captured for translocation since 1990. Thirteen independent sea otters were observed at the island in December of 1993. The number of otters observed at SNI (not including dependent pups) has remained relatively stable at about 13-15 individuals from November 1989 through 1993. Reproduction at the island is continuing and as of 1993, at least nine pups are believed to have been successfully weaned into the colony.

Identification of individual otters, with few exceptions, is difficult due to tag loss. However, based on identification of tags and tag scars during survey efforts, at least six of the otters observed at SNI are animals that were translocated to the island (in 1991, nine were reported).

The 1992 report noted that available information indicated the adult population was declining. Without better ability to identify animals, an accurate explanation of colony status will be difficult. Uncertainty will remain as to whether animals are moving in and out of the translocation zone, pups are being recruited into the colony, and/or if observation error is the source of changing counts.

Status of Colony

One hundred thirty-nine sea otters (31 males, 108 females) were translocated to SNI during the period August 24, 1987, to July 19, 1990. As of December 31, 1993, the disposition of 59 sea otters that are no longer at the island is known or suspected. Thirty-six sea otters left the island and returned to

the parent population, (subsequent observations are not recorded in this section). Three otters have been sighted in the "no-otter" management zone in southern California. Ten were caught in the Management Zone and moved back to their original capture site on the mainland. Three males died at SNI from "stress" related to their capture and transportation. Five females and two males were found dead in southern California; one otter had been shot, two were reported to have drowned in fishing gear, and the others died of undetermined causes. (In past reports, one of the otters now placed in undetermined causes was suspected to have died in fishing gear).

A total of 28 pups are known to have been born at SNI. During this calendar year, six were observed at the island. To date, at least nine pups are believed to have been successfully weaned.

Two groups of translocated otters have been found away from SNI, one at San Miguel Island and one at Point Purisima. In both groups dependent pups were observed. Because San Miguel Island is within the Management (no-otter) Zone, the Service is committed to remove these animals as required under Public Law 99-625. Purisima Point is north of the Management Zone but within an area where no restrictions exist for set-net fishing, and unless restrictions are implemented, this small group may be eliminated. The San Miguel Island group has been nearly eliminated by containment efforts under P.L. 99-625. The Point Purisima group still persists.

Containment

The containment program is designed to prevent sea otters from colonizing the Management Zone through a cooperative effort between the Service and the CDF&G. The containment operation, as outlined in the Translocation Plan and the Service's Containment Plan, consists of three interrelated and interdependent activities: (1) surveillance of the Management Zone, (2) capture of sea otters in the Management Zone, and (3) post capture relocation.

Five sea otters—four independent animals and one dependent pup—were captured in the Management Zone in 1993. Captures were the result of cooperative efforts between the Service and the CDF&G. All captures in 1993 were made by divers trained in rebreather apparatus using Wilson traps attached to underwater vehicles.

In 1993, as in the previous year, capture efforts in the sea otter Management Zone were focused near Point Bennett, San Miguel Island. A group of ten sea otters was observed at San Miguel Island in March/April 1991. Since the group was discovered, eleven independent otters and 3 pups have been captured and removed from the island. One adult male was captured and removed twice. Field surveys indicate that two sea otters may remain at San Miguel Island.

In February 1993, all sea otter containment activities were halted and no attempts were made to capture otters for the remainder of the year. In February, three independent otters and one dependent pup were captured at San Miguel Island and transported to the northern end of the mainland range (Santa Cruz County). Two of the independent otters died shortly after their release. This raised concerns about the requirement that all sea otter containment activities be conducted in a non-lethal manner. An evaluation of the containment techniques used proved to be inconclusive and recommendations were made to continue sea otter containment activities with minor modifications. Recommendations included modifications designed to minimize stress from capture and transport prior to release, time releases for optimal environmental conditions, and additional monitoring of released animals. Sea otter containment activities were not continued however, because funds were not available for the program for the remainder of the fiscal year.

In December 1993, representatives from the Service and the CDF&G met to discuss the status of the translocation and future containment efforts. Follow-up meetings were scheduled for early 1994.

Twenty independent sea otters and four dependent pups have been captured in the Management Zone since 1987. Two otters were captured and removed from the Management Zone twice. Ten of the independent animals were females and ten were males. Eleven of the otters had been translocated to SNI, four had apparently swam down from the mainland range, and nine either swam down from the mainland range or were born in the Management Zone or at SNI.

The containment effort to date appears to have successfully prevented sea otter colonies from becoming established in the designated Management Zone. However, sea otters have entered the Management Zone at a slow rate and containment activities have been labor intensive and costly. The long-term viability of sea otter containment through non-lethal means remains in question.

Containment activities are required to continue unless: (1) the translocation to San Nicolas is deter-

mined to be a failure; (2) the containment effort fails to maintain the Management Zone free of otters; or (3) the Management Zone is eliminated.

Law Enforcement

Sea otters have been intentionally harassed, shot, clubbed, and drowned in legally and illegally set commercial fishing gear in past years. Service law enforcement officers conduct surveillance operations, investigations and seek prosecution of individuals who harm sea otters. Pursuant to P.L. 99-625 and Federal regulations governing the sea otter translocation program, the Service has implemented a law enforcement plan for protecting the SNI colony of sea otters.

Four sea otters were found to have died of gun shot wounds in 1993. It is likely that these animals represent a fraction of southern sea otters killed annually by malicious activities. Service law enforcement agents continue to investigate these shootings. However, evidence required to bring such cases to court is often lacking.

This year, one individual was successfully prosecuted and fined for intentionally trying to run over a sea otter with a jet ski. It appears that he may have hit a resting sea otter. An injured otter was observed in the area but it was never recovered.

A fisherman was caught using gill-nets in an area closed to gill-net fishing. The area was closed to protect sea otters and a drowned sea otter was found in the fisherman's net. The fisherman pleaded guilty to illegal fishing (a State violation) and is currently being prosecuted Federally for the take of a threatened species.

A number of sea otters have been reported in the "no-otter" Management Zone this year. These otters may be the most likely targets of illegal activities. Otters in the Management Zone wander in isolated areas that are difficult to monitor and patrol. They are also unprotected from incidental take in legally set fishing gear. Prompt removal of otters found in the Management Zone has been the goal since the translocation of otters to SNI began. Increased law enforcement activity within the Management Zone has been considered for those cases where capture efforts have been delayed.

A reward for information leading to the conviction of the individual(s) responsible for the death of a sea otter translocated to SNI has never been collected. The otter was found shot and wrapped in chains on a beach near Pt. Mugu in 1987. The case has been closed.

Incidental Take Within the Mainland Range

Several lines of direct and indirect evidence indicate that incidental drowning of sea otters in gill and trammel entangling nets has been a significant source of mortality. The State of California entered into a cooperative agreement with the NMFS to assist with the monitoring program required under the 1988 Amendments to the Act. In both Monterey Bay and Morro Bay, one-to-three NMFS observers are stationed to document incidental take. One sea otter was reported to be killed in these nets in 1993. This animal was found alive, in poor health and entangled with net. While under veterinarian care, the animal died. In summation, from June 1982 to December 31, 1993, a total of 74 otters have been observed or otherwise known to have drowned in legally set commercial fishing nets: 6 in 1982, 6 in 1983, 16 in 1984, 12 in 1985, 3 in 1986, 5 each in 1987 and 1988, 11 in 1989, 9 in 1990, 0 in 1991 and 1992, and 1 in 1993. The net attributed to the 1993 mortality is of unknown source. It may have been legally or illegally set, or a piece of netting set adrift in which the otter became entangled.

In 1992 there was an incident of a dead sea otter recovered by a CDF&G warden in a crab pot located in 30 to 60 feet of water off Point Santa Cruz.

California Senate Bill #2563, which provides additional restrictions on the use of gill and trammel nets in coastal waters, was enacted in 1990 and promulgated on January 1, 1991. This bill prohibits the use of gill and trammel nets in waters shallower than 30 fathoms between Waddell Creek in Santa Cruz County and Point Sal in Santa Barbara County. The 30 fathom contour was selected based on analysis and recommendation by the Service using data obtained during a study by the MMS. The analysis indicated that currently only an extremely small number of sea otters use waters deeper than 30 fathoms. The Service recommended to the NMFS that a 30 fathom closure should be implemented to likely reduce the incidental take of sea otters to near zero. The State legislation has significantly reduced the number of incidental sea otter drownings. The NMFS and the CDF&G will continue observations of the set-net fishery occurring in waters outside this restricted area.

The small group of sea otters, currently found at Purisima Point, are at risk of incidental take. Purisima Point is between Point Sal and Point Conception, an area in which no restriction of gill- or trammel-net fishing exists for the protection of sea otters. Observations of set-net fishing activity in

this area is not convenient and therefore not typically covered by the NMFS's observer program. The Service has requested that the CDF&G enact an emergency closure and close the area to set-net fishing. The CDF&G has chosen not to close the area because there is no direct evidence that sea otters are being taken by the set-net fishery in the area.

The crab/lobster pot fishery continues to be a concern. Sparse data and anecdotal records indicate that southern sea otters are incidentally taken in the pot fishery. Sea otters are known to be taken occasionally in Alaska's crab pot fishery. Alaska's pot fishery utilizes different types of gear and is not directly comparable to the California fishery however. The Service continues to collect data and evaluate incidental take in crab/lobster pots.

Sea Otter Stranding and Mortality

In California, nearly 100 sea otters are found either moribund or dead each year. Many of the carcasses are severely decomposed and it is difficult, if not impossible, to determine the cause of death. In 1992, the Service in conjunction with the CDF&G initiated a new mortality program. Dead sea otters found in a fresh condition are sent to the Service's National Wildlife Health Research Center (NWHRC) in Madison, Wisconsin, for necropsy. The primary purpose of this new program is to enhance knowledge of sea otter pathology.

Fifty southern sea otters collected from January through December 1993 were necropsied at the NWHRC. The deaths of 12 of the 50 animals necropsied were attributable to infectious/parasitic diseases. These diseases included coccidioidomycosis (1 animal), aberrant acanthocephalan parasite migration (6), protozoal encephalitis (2), valvular endocarditis (1), myocarditis (1), and hemorrhagic cystitis with calculus formation (1).

Causes of death in the other sea otters included various types of trauma (8), emaciation and/or mating wounds (7), tumors (3), net entanglement (1), and various conditions of mechanical and/or functional impairment of uncertain cause (10) (e.g., esophageal obstruction, blindness, hemorrhagic gastroenteropathy, etc.). The cause of death in nine animals is undetermined at this time.

The frequency of infectious/parasitic disease mortalities in the southern sea otter is higher than that seen in other endangered mammals or most other endangered species.

Rehabilitation Program

In 1993, the Service took steps to formalize a coordinated program for the rehabilitation of stranded and injured otters and the permanent housing for animals that cannot survive in the wild. The program consists of a small network of aquariums and rehabilitation centers nationwide that provide care and housing for stranded southern sea otters. During 1993, a record number of stranded sea otters received care. Hopefully in 1994, additional facilities will join the network to help provide care and housing for an increasing number of stranded sea otters.

During 1993, the Monterey Bay Aquarium's (Aquarium) rehabilitation program received 23 stranded sea otters. Seven animals died shortly after arrival at the Aquarium. Of sixteen that received medical care, only six survived. A majority of the animals that died before care was provided were sent to the Service's NWHRC as part of the sea otter mortality program. In addition to sea otters received in 1993, the Aquarium also cared for three sea otters acquired in 1992. In summary, nine of the 26 sea otters that the Aquarium handled during 1993 survived, although one died post release.

Of the nine animals that survived, eight were abandoned or orphaned sea otter pups. One pup is currently in the rehabilitation program, two were successfully rehabilitated and released to the wild, and one died after release. The other pups were declared non-releasable and are being housed temporarily at the Aquarium, Sea World in California, and the New York Aquarium.

The Service is currently considering managing this network as part of a program to conserve and maintain a genetic stock representative of the wild population.

Section 7 Consultations

Pursuant to Section 7 of the ESA, the Service reviews proposed Federally funded, conducted, or permitted activities that may affect the southern sea otter and issues Biological Opinions (Opinion) and recommendations to minimize impacts.

The Army Corp of Engineers consulted with the Service regarding the reconstruction of a Monterey Bay breakwater jetty. The Service reported the possibility that some otters may be incidentally or intentionally harassed. An incidental take level was identified and reasonable and prudent measures were provided to reduce the level of take.

Section 6

In 1993, no funds were provided for the southern sea otter.

Oil Spill Activities

The Service's sea otter oil spill contingency plan has been drafted and is currently being revised to incorporate pertinent aspects of the Federal Oil Pollution Act of 1990, and California Senate Bill #2040 creating a new oil spill division within the CDF&G. The ramifications of both Federal and State legislation have yet to be realized or applied to the existing document. The State is actively pursuing the construction of a sea otter rescue and rehabilitation facility (as required by Senate Bill #2040).

On August 3, 1992, approximately 120 barrels of San Joaquin crude oil was spilled in Avila Beach, San Luis Obispo County. A pipeline running to storage tanks atop a near shore bluff ruptured and oil spilled down a steep canyon into the ocean. Approximately 60 otters were in the Avila Beach area at the time of the spill. At least four sea otters came in contact with the oil. Two were found dead, covered with oil; one was captured and died while being transported to a rehabilitation facility (this otter apparently died of coccidioidomycosis although it was oiled at time of capture); and one oiled otter was captured, cleaned and released. A settlement for damage to natural resources is still pending.

West Indian Manatee

The Florida Manatee Recovery Plan, approved by the Fish and Wildlife Service (Service) on July 24, 1989, guides the activities of a multi-agency Manatee Recovery Team. The Recovery Team, made up of representatives of the Service, the Florida Department of Environmental Protection (FDEP) (formerly the Florida Department of Natural Resources), the MMC, non-governmental organizations (such as the Save the Manatee Club, Inc., and the Florida Power and Light Corporation [FPL]), law enforcement agencies (including the Florida Marine Patrol [FMP]) and others, implements the many tasks at hand. Manatee recovery tasks include the following activities:

1. Gain a better understanding of the causes of manatee harassment, injury, and mortality. Minimize or eliminate these hazards wherever possible and enhance the survival of the species.

The salvage and necropsy program provides yearly information on manatee mortality. During 1993, 145 manatee carcasses were recovered and necropsied by FDEP (one additional animal was recovered outside of Florida). The total number of watercraft-related deaths, 35, was down slightly from 1992. Watercraft kill more manatees than any other known human-related cause. Perinatal deaths from natural or undetermined causes were also high with 39 deaths. Five manatees died as a result of being crushed in locks or flood gates during 1993.

To reduce the number of deaths and injuries to manatees from watercraft, FDEP and the Service have been working with 13 key Florida counties to develop Manatee Protection Plans (MPP). MPPs include guidelines for future construction of boat docks, marinas, and other developments in essential manatee habitat, plans for public education, site-specific speed zones, and other manatee protection measures tailored to the needs of each county. Thus far, only Citrus County has gained final acceptance of its plan. The Citrus County Plan was incorporated into their Growth Management plan.

Reducing boat speeds is considered to be the best way to protect manatees from boat collisions in Florida's waterways. Slow, predictable traffic is easier for manatees to avoid. The first step in most MPP's is the development of site-specific speed zones. Based on the NBS's Sirenia Project's telemetry data, FDEP mortality data, and other sources of information, speed zone plans are carefully developed and thoroughly reviewed, often after extended negotiations. As each plan is completed, it is submitted to the Governor and Cabinet for approval, at which time it becomes State law. As of December 1993, site-specific speed zones were completed in 11 of the 13 key counties, and regulatory signs have been posted in 10 of them.

Within National Wildlife Refuges, areas presenting the greatest threat to manatees are posted and maintained. The Crystal River National Wildlife Refuge manatee sanctuaries are posted each year between November 15 and March 31. These sanctuaries were expanded in 1991 and in 1992 by emergency rule. The decision on whether to adopt these sanctuaries was pending in 1993.

Merritt Island National Wildlife Refuge maintains a 15-square-mile, year-round manatee protection area in essential manatee habitat. This area is off-limits to motorized vessels of all kinds. Surveys show manatees have increased their use of the area since boats have been excluded.

Agencies are working together to eliminate water control structure and lock-related manatee deaths. The Service, FDEP, and representatives from the water management districts and the Corps of Engineers (Corps) meet regularly to discuss problems and to design and evaluate possible solutions. Several solutions, including redesigning structure doors, using sonar to detect a manatee's presence, using sound as a warning device, building barriers to exclude manatees, and designing pressure-sensitive reverse mechanisms (similar to that on elevator doors) to prevent manatees from becoming trapped in a closing gate, are currently being installed and tested. In 1993, the Service participated in the review of an installed pressure-sensitive reverse mechanism.

Recovery activities include the rescue and rehabilitation of injured or diseased manatees and transfers of captive animals. FDEP's rescue coordinator, in conjunction with the Service, handles the initial phases of a rescue event. Selected teams "verify" the presence of an injured animal, then rescue teams capture and transport the manatee to a rehabilitation center, if necessary.

Activities in manatee areas are closely regulated by the permitting processes. The Service, under Section 7 and the Fish and Wildlife Coordination Act, reviews all projects located in essential manatee habitat that have any Federal agency involvement. In 1993, the Jacksonville and Vero Beach, Florida, Field Offices consulted on numerous Corps permit applications, U.S. Coast Guard (USCG) permits for high-speed marine events, and a number of other projects with potential impacts to manatees. Since 1982, the Service has written 67 jeopardy Biological Opinions (59 since 1987) for manatees, more than for all other endangered or threatened species combined. As MPPs in each key county are completed, the permitting process will be streamlined. New manatee conditions were developed in conjunction with the Corps and FDEP for recently issued public notices on general permits for docks, marinas, and boat ramps.

Measures to reduce the potential of impacts to manatees from high-speed marine events have been implemented. The Service and FDEP routinely review USCG permit applications for marine events and recommend that applicants be required to adhere to the draft high-speed marine event measures adopted by a 1991 working group composed of racing organizations and agency representatives. The USCG has been supportive in their adoption of Service and FDEP recommendations and routinely denies permit applications when these agencies determine that the proposed event is not in compliance with the measures.

The Service is taking an active role in the management of captive manatees. The Service is developing a manatee staging area for the purpose of releasing orphan/captive-born/long-term captive manatees. The structure has been designed and has received necessary permits from the Corps. Captive manatee transfers are being monitored to ensure the health and well-being of the captive animals and to ensure that limited captive facilities are being used at maximum efficiency. Research projects involving captive manatees are being coordinated to assure consistency with recovery plan provisions.

A total of 31 manatee rescues occurred in Florida in 1993. Altogether, 125 responses were logged by program participants to reports of manatees in distress. In 22 cases, manatees were brought in to rehabilitation facilities for treatment. Nine manatees were rescued and released on-site, mostly due to entanglement in fishing or crab pot lines. Eight manatee deaths occurred at the facilities during the year. Another ten manatees were transferred between facilities for management purposes. As of January 1, 1994, 48 manatees remained in captivity in five Service authorized Florida facilities, and two manatees were being held in captivity in Puerto Rico by the Caribbean Stranding Network (CSN). Four "pre-act" manatees are still in captivity (Romeo and Juliet at Miami Seaquarium, Rosie at Homosassa Springs, and Snooty at South Florida Museum in Bradenton, Manatee County).

Regular meetings are held to review captivity and rehabilitation issues. An enhancement permit (PRT-770191) was issued by the Service's Office of Management Authority to the Manatee Coordinator to conduct manatee rescue, rehabilitation, and release program management in the Southeastern United States and Puerto Rico.

Two meetings of the Interagency/Oceanaria Manatee Group, chaired by the Service's Manatee Coordinator were held in 1993. Miami Seaquarium hosted the first meeting at the Rosenstiel School of Marine and Atmospheric Sciences, University of Miami, on May 26. A second meeting was held at Homosassa Springs State Wildlife Park on October 14. Both meetings included reviews of captive status and distribution, individual release category review, pending release and transfer coordination, rescue program activities and needs, consideration of program expansion and partial reimbursement for critical care and rehabilitation of manatees under a new State of Florida funding mechanism.

A Captive Manatee Planning Committee (CMPC) was established by the Service in the fall of 1992, as a subgroup of the Manatee Recovery Team and the larger Interagency/Oceanaria Manatee Group to focus on specific captive issues and to coordinate management and research activities in the cooperative program. The composition of the CMPC includes Federal representatives of both research (NBS) and management offices (Service) within the Department of the Interior and the FDEP, authorized captive facilities (Sea World of Florida, Lowry Park Zoo, Miami Seaquarium, Living Seas, Homosassa Springs State Wildlife Park), and an independent chairperson. Representatives from the MMC and USDA/APHIS are invited to attend all meetings as an interagency coordination mechanism. The CMPC acts in several capacities to communicate program developments, reviews captive research proposals, explains permitting procedures, and assists in coordination of projects with facilities and researchers.

Efforts to expand manatee recovery activities worldwide continue. Florida Manatee Recovery Team members and others are working with the Wider Caribbean Coalition for the Environment to encourage the development of recovery plans in other countries.

The Service is reviewing manatee recovery needs and activities in Puerto Rico. Site visits were conducted in order to review NBS study sites at the Roosevelt Roads Naval Station, CSN rehabilitation facility at Isla Magueyes, and the Caribbean Field Office.

The Jacksonville Field Office issued a letter of Authorization to the CSN in 1992 to conduct manatee rescue and rehabilitation activities in Puerto Rico and the U.S. Virgin Islands. The CSN brought a second orphaned calf into captivity on May 28, 1993. Two orphans are being maintained at the Isla Magueyes facility. Moisés, the first orphan calf rescued in November of 1991, is scheduled for transport to a soft release or staging area to be constructed at Roosevelt Roads Naval Reservation in northeastern Puerto Rico in late March of 1994. This will be the first step towards his eventual return to the wild after a trial period of acclimation.

2. Efforts proceed to ensure the continued existence of suitable habitat for manatees in the future.

Manatee tagging studies continue to document the variety of habitats critical to manatees. The Sirenia Project's ongoing east coast telemetry project continues with ground and aerial tracking of tagged animals. Sirenia Project staff have compiled a summary of east coast telemetry data, covering the period 1985 through 1993. The recovery program continues to provide substantial financial support for these telemetry efforts.

The Service, FDEP, and Citrus County representatives continue to participate in an interagency working group responsible for developing and implementing a Summer/Winter Aquatic Plant Management Plan for Crystal and Homosassa Rivers.

To protect and monitor important manatee habitat, the number of refuges, and management areas need to be increased. For already protected areas, management plans need to be developed. The Service's Jacksonville Field Office reviews management plans for State and Federal lands in manatee habitat. In 1993, the office continued its focus on the Crystal River and Lake Woodruff National Wildlife Refuges.

The Service is currently reviewing proposals to establish additional manatee sanctuaries at Crystal River National Wildlife Refuge. These additions would include three new sites and the expansion of an existing sanctuary.

The Service, as one component of its response to a lawsuit over compatible use issues in the refuge system, implemented a new management plan for the Crystal River National Wildlife Refuge. The new plan restricts diving in greater portions of the refuge and allows divers to access the main spring boil at the Banana Island site.

At Lake Woodruff National Wildlife Refuge, the Service established an emergency rule by which to protect the manatee within the refuge. That rule expired in September 1993, whereupon State rules went into effect to protect manatees in this area. The State continues to examine various strategies by which to protect manatees in this area. The Service continues to provide support for the State effort and intends to write a Federal rule paralleling a final State rule for these waters. A Federal rule will be proposed following adoption of the State rule by the State's Governor and Cabinet.

The Service also supports the State in its active land acquisition program known as the Conservation and Recreation Lands (CARL) Trust Fund. Acquisitions are added to State Preserve, Reserve, or Park systems. The Governor and Cabinet have directed that CARL acquisition proposals important to manatees be given priority whenever possible.

Warm-water winter refuges, both natural and man-made, must be properly protected. The Service and FDEP worked with utility companies to coordinate plant shutdown schedules in order to cause minimal impacts to manatees.

FPL now monitors manatee movements into and out of the intake canal at the Port Everglades Plant in Fort Lauderdale, Florida, and reduces the flow when manatees enter. Since 1990, 49 animals entered and left the canal. A number of manatees have had to be rescued from the canal in past years. In early 1993, a radio-tagged cow/calf pair had to be removed by rescuers because they would not (or could not) leave.

3. Educational programs, by improving public understanding, will reduce the incidence of manatee harassment and injury and enhance law enforcement activities.

The Service supports the efforts of the FDEP, Save the Manatee Club, Inc., boat manufacturers and dealers, marinas, and other groups (inclusive of local Marine Industry Association (MIA) representatives), who have been actively erecting educational signs at key public access points which explain the harm involved in feeding and harassing manatees, the dangers of boat collisions, and the proper disposal of monofilament lines.

Florida Power Corporation runs a booth on weekends at Blue Springs State Park and MIA members hand out information at their boat shows. The Save the Manatee Club, Inc., holds training seminars throughout the State, trains display booth representatives, and enlists members' help in a sighting program. Seminars train club members to give manatee education programs to schools, civic groups, etc. In 1993, over 100 volunteers gave over 400 programs reaching about 9,000 people in the 13 key counties. A teacher in-service program is available and 15,000 educator guides, travel displays, and sirenian posters were mailed to teachers across the nation. Sixteen hundred press kits were mailed out nationwide. Additional funding for educator's guides came from FPL and the MMC. Save the Manatee Club, Inc., also encourages manatee educational materials be included in boating safety courses and produces public service announcements.

Oceanaria with captive manatees provide excellent opportunities for public education within the context of the rehabilitation effort. For example, Sea World of Florida can accommodate over 10,000 visitors daily and provides these visitors with educational materials. Additionally, Sea World has produced, in conjunction with various manatee experts, an accurate and informative educational video, "Manatees: Preserving a Legacy" that is widely distributed for public education purposes.

Crystal River National Wildlife Refuge, where swimming with manatees is popular, consistently coordinates the printing of a handout for boaters and divers in Kings Bay. Distributed for free by local dive shops, this brochure shows the location of manatee sanctuaries and speed zones, defines slow and idle speed, describes harassment and its penalties and lists "Manatee Do's and Don'ts," that educate the public on how to best interrelate with manatees. In 1993, the refuge implemented a radio program that broadcasts Crystal River manatee advisories.

4. The status of the manatee population is being better evaluated by monitoring general patterns of distribution and relative abundance.

Individual manatees can be identified by the scars on their hides and the mutilations on their tails and flippers. More than 900 animals now have been catalogued in this way, making it possible to identify individual manatees year-after-year and to monitor their reproductive status. Partially funded by FPL and the Florida Audubon Society, the Service's Sirenia Project has now computerized the catalogue data base which simplifies scar pattern matches.

State-wide aerial surveys are used as a means by which to better understand manatee abundance in Florida. Surveys have been conducted in 1991 and in 1992, but efforts to survey in 1993 were ineffective due to weather patterns which hampered survey efforts.

Data collected during the 1991 State-wide synoptic aerial surveys of manatee wintering habitat in Florida and southeast Georgia were further evaluated in order to develop a better understanding of the database and the implications these counts may have on efforts to understand trends in population abundance. FDEP is experimenting with alternative aerial survey techniques in Brevard County and in Pinellas County. Such survey methods may allow for better determination of population indices on a site-specific basis. Synoptic surveys were not flown in 1993, due to a lack of optimum cold weather conditions that would concentrate manatees and thus maximize survey counts.

Manatee biologists, population biologists, statisticians, and modelling biologists met in 1992, in an effort to develop an accurate population model for manatees. The proceedings from this workshop are due to be published in early 1994.

5. The Manatee Recovery Plan is being reviewed and updated.

The Manatee Recovery Team met on August 24, 1993, to review and comment on a draft revision of the Manatee Recovery Plan, developed and submitted to the Service by a five member drafting subcommittee. A Service draft will go out for review, and a final revised plan is anticipated for release in 1994.

(Note: A summary of the Manatee Recovery Team's activities for 1993 was compiled by the Service. The 1993 Annual Report of the Florida Manatee Recovery Plan is available from the Manatee Coordinator, U.S. Fish and Wildlife Service, 6620 Southpoint Drive, South, Suite 310, Jacksonville, Florida 32216-0912.)

Dugong

On August 5, 1993, the Service published a proposed rule (58 FR 41688) to extend endangered status to the dugong throughout its entire range. The proposed rule explained that, due to an oversight, dugongs that occur in the United States (i.e., those that occur in the Trust Territory of the Pacific Islands, Republic of Palau) are not officially listed as endangered; however, all individuals that occur in foreign countries are. The Service explained that the Palauan population of less than 200 animals is the most isolated dugong population in the world and is seriously threatened by poaching. The Service stated further that poaching and the dugong's low reproductive potential may lead to the extinction of the Palauan population by the end of this century.

The proposed rule also explained that habitat degradation associated with increased development and water projects in Palau could develop into a more serious threat to the population as tourism and development continue to increase. The dugong is dependent on limited, near-shore waters with abundant sea grasses, and any destruction or modification of these areas could seriously effect the already stressed population. This action was pending at year's end.

Hawaiian Monk Seal

Service personnel from the Pacific/Remote Islands National Wildlife Refuge (NWR) Complex, which includes staff from the Refuge Complex office, Hawaiian Islands and Midway Atoll NWR's, cooperate regularly with NMFS personnel on various research and recovery actions recommended in the Hawaiian Monk Seal Recovery Plan. As part of production and population surveys, Service staff assisted NMFS researchers on refuge islands with tagging weaned pups, resighting tagged seals, recording births, injuries and mortalities, freeing entrapped and entangled animals, and collecting specimens from dead animals.

Marine debris that washed ashore, and old waste material such as wire and cable that was previously discarded by the military and exposed by erosion, and that could harm seals and other wildlife, was collected or destroyed in place. Seals that came ashore entangled in marine debris were freed whenever possible. Refuge staff conducted this work exclusively during the six to eight months that NMFS researchers are absent from Pacific/Remote Island Refuges each year. At Tern Island, Refuge staff conducted daily patrols all year to search for, and free disoriented seals entrapped behind the degraded sea wall.

Hawaiian Islands NWR staff based in Honolulu, and on Tern and Laysan Islands, provided a variety of support services: transportation of personnel, assistance with collection of live seals for rehabilitation, and transportation of equipment and supplies aboard Service-funded aircraft and vessel charters. Additional logistical support important to the NMFS program included radio monitoring and message relays for field camps, and maintenance of the Tern Island Field Station and aircraft runway.

Refuge staff served on the NMFS Animal Care Committee, required by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service. The committee implemented protocols for maintaining captive monk seals, and reviewed research protocols for captive animals.

Cover Photos
From top left, clockwise:

A West Indian manatee.
U.S. Fish and Wildlife Service photo.

Two polar bears.
U.S. Fish and Wildlife Service photo.

A southern sea otter.
U.S. Fish and Wildlife Service photo by Jim Estes.

Pacific walrus at Round Island, Alaska.
U.S. Fish and Wildlife Service photo.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