

Administration of the Marine Mammal Protection Act of 1972

January 1, 1991 to December 31, 1991



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), and 102 Stat. 4755 (1988)) 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, 1991, to December 31, 1991, on the administration of the Marine Mammal Protection Act with regard to those mammals.

Issued at Washington, D.C., dated November 12, 1993

A handwritten signature in cursive script, reading "Hollis B. Zettler". The signature is written in dark ink and is centered on the page.

Director

Administration of the Marine Mammal Protection Act of 1972

January 1, 1991 to December 31, 1991



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

Contents

Introduction	1
Authority	1
Species List.....	1
Summary of the 1991 Program	2
Appropriations.....	2
Outer Continental Shelf Operations and Environmental Studies	2
Research and Development.....	2
Distribution of Expenditures.....	3
Marine Mammal Protection Act	3
Endangered Species Act	3
Enforcement	8
Permits and Registrations.....	9
Scientific Research Permits.....	9
Public Display Permits	10
Registered Agent/Tannery Permits	10
ESA Listing Actions.....	11
International Activities	11
US-USSR Environmental Agreement: Marine Mammal Project.....	11
Polar Bear Activities	11
Status Reports	12
Polar Bear	12
Sea Otter-Alaska	16
Walrus.....	17
Marking, Tagging and Reporting Program.....	19
Incidental Small Takes	22
Sea Otter-Southern	23
West Indian Manatee.....	27
Dugong	32
Hawaiian Monk Seal.....	33

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 dugongs. 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



A white, three tusked walrus (lower center). U.S. Fish and Wildlife Service photo.

Species Act-related responsibilities and maintains a close working relationship with the Marine Mammal Commission and its Committee of Scientific Advisors.

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	<i>Ursus maritimus</i>	Yes	No
Sea otter-Alaska	<i>Enhydra lutris lutris</i>	Yes	No
Sea otter-southern	<i>Enhydra lutris nereis</i>	Yes	Threatened
Marine otter	<i>Lutra felina</i>	Yes	Endangered
Walrus	<i>Odobenus rosmarus</i>	Yes	No
Dugong	<i>Dugong dugon</i>	Yes	Endangered
West Indian manatee	<i>Trichechus manatus</i>	Yes	Endangered
Amazonian manatee	<i>Trichechus inunguis</i>	Yes	Endangered
West African manatee	<i>Trichechus senegalensis</i>	Yes	Threatened

Summary of the 1991 Program

Appropriations

The Service's most recent funding authorization was under authority of Section 116(b) of the Act as adopted in the 1988 amendments (102 Stat. 4755) for Fiscal Years (FY) 1989 to 1993. Calendar year 1991 covered by this report overlaps FYs 1991 and 1992; funds (in \$000) authorized for both years, as well as funds spent in FY 1991 and projected to be spent in FY 1992, are presented.

	Authorized	Expended	Projected
Fiscal Year 1991	\$3,240	\$3,236	—
Fiscal Year 1992	\$3,370	—	\$3,413

Outer Continental Shelf Operations and Environmental Studies

The Service participates in the Department's Outer Continental Shelf Leasing Program (including oil and gas and other minerals) by providing advice, review and input at various stages in leasing, exploration, development and production processes. The Service provides technical expertise to the Minerals Management Service on the expected impacts of such development on marine mammal resources under Service jurisdiction and related habitat.

The Service continued an intense involvement in the Department's new 5-Year Oil and Gas Leasing Program (1992-1997). The Proposed Plan and Draft Environmental Impact Statement were reviewed in all Service Regions with extensive comments provided regarding impacts to the southern sea otter and all Alaska marine mammals under Service jurisdiction. The Service provided specific technical information regarding the status and location of wildlife species and recommendations regarding leasing scenarios.

The Secretarial Issue Document and Final Notice of Sale for Lease Sale #126 (Chukchi Sea, Alaska) was evaluated and recommendations presented for the consideration of the Assistant Secretary for Fish and Wildlife and Parks. The Service recommended deferral of a portion of the sale known as the Pt. Lay Deferral. Certain other mitigation options were advocated including information clauses to lessees alerting them to measures that may be taken for protection of polar bears.

The draft Secretarial Issue Document and proposed Notice of Sale for Lease Sale #107 (Navarin Basin, Alaska) was evaluated. Three areas of leasing deferral were recommended to minimize the potential for oil spill impacts to sensitive wildlife resources. Other mitigation measures addressing oil spill response preparedness, protection of right whales and others were also supported.

Research and Development

The Service conducted research under the Act during FY 1991 at several Centers and Field Stations. The Alaska Fish and Wildlife Research Center is responsible for polar bear, walrus and northern (i.e., Alaska) sea otter research. The National Ecology Research Center in Fort Collins, Colorado, is responsible for all other marine mammal research, including the southern sea otter, manatees and other depleted species. The Cooperative Fish and Wildlife Research Units Center conducts additional research to support the needs of Service Regions, and other Service Research Centers. For each project active during FY 1991, the project title and summary, followed by highlights of FY 1991 accomplishments are given below by species. Previous results and accomplishments can be found in earlier publications.

Distribution of Expenditures (in \$000)

	Actual FY 91	Projected FY 92
Marine Mammal Protection Act		
Research and Development		
Alaskan sea otter ¹	\$ 320	\$ 320
Walrus	205	220
Polar bear	894	910
Total Research and Development	<u>\$ 1,419</u>	<u>\$ 1,450</u>
Management		
Permit activities	\$ 30	\$ 30
Enhancement activities	4	5
Law enforcement activities	858	803
Other management activities	925	1,125
Total Management	<u>\$ 1,817</u>	<u>\$ 1,963</u>
Grand Total	<u><u>\$ 3,236</u></u>	<u><u>\$ 3,413</u></u>
Endangered Species Act		
Section 6 (Grants-to-States)		
California—sea otter	\$ 0	\$ 0
Florida—manatee	87	0
Total Section 6	<u>\$ 87</u>	<u>\$ 0</u>
Section 15 (Research and Development)		
Endangered/threatened otters	\$ 756	\$ 588
Manatee	625	676
Total Section 15 Research	<u>\$ 1,381</u>	<u>\$ 1,264</u>
Section 15 (Management)		
Endangered/threatened otters	\$ 399	\$ 372
Manatee	389	551
Hawaiian monk seal ²	62	62
Total Section 15 Management	<u>\$ 850</u>	<u>\$ 985</u>
Grand Total	<u><u>\$ 2,318</u></u>	<u><u>\$ 2,249</u></u>

¹ Total does not include \$904 in FY 1991 for damage assessments related to the *Exxon Valdez* oil spill.

² Although the National Marine Fisheries Service 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).

1. Polar bear

A. Project Title and Summary:

Distribution, timing and importance of polar bear denning in northern Alaska.

Female polar bears captured in October and November or March and April are fitted with radio collars and subsequently followed to their maternity dens. Activities of instrumented bears are monitored during den entrance, occupancy and emergence periods. Findings of radio telemetric denning studies are supplemented by springtime aerial surveys of high probability denning areas. Dens are classified and denning habitat preferences are determined.

1991 Activities/Accomplishments:

- A plane crash resulting in the death of the pilot and two polar bear researchers in October 1990 severely limited field work. Nevertheless, 37 polar bears were captured and released in spring 1991; 15 females were fitted with satellite transmitters and 4 with conventional VHF transmitters.
- Three more confirmed dens were located during the winter of 1990-1991. This brings the total number of suspected dens located during this study to 140 and the total confirmed dens to 114. Over the entire study, 62 percent of suspected dens located by telemetry were found on pack ice, 33 percent on land and 5 percent on land-fast ice. Forty-three percent of all confirmed land or fast ice dens were found on the Arctic National Wildlife Refuge and 31 percent were within the bounds of the 1002 area.

B. Project Title and Summary:

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

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.

1991 Activities/Accomplishments:

- The previously mentioned plane crash with subsequent loss of life of all persons onboard resulted in significant delays to the activities and accomplishments of this project—reinstrumentation of many bears before their collars failed was

prevented—but monitoring of polar bears with active radios continued.

- Stable carbon isotope ratios in hair and claw tissues vary among geographic areas, and appear to constitute a chronological record of where bears have fed over the past 12-16 months.
- Analysis of DNA patterns suggest that mitochondrial DNA may have limited abilities to aid in determination of stock separation. Nuclear DNA may be more useful in addressing population biology questions.

C. 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 bears are determined by radio tracking and snow tracking. Prey species, frequency of kills, habitat types and hunting methods are recorded.

1991 Activities/Accomplishments:

- Logistical, ice data availability and equipment problems encountered in this study, plus delays caused by the loss of two researchers have resulted in few of the original objectives being met.
- Limited information based on snow tracking has revealed much detail about polar bear activity, including distances traveled, number of attempted kills and kill success rate. The quality of this data has been high, warranting current efforts to get this work back on track.

D. Project Title and Summary:

Population definition and estimation of survival, recruitment and number of polar bears in north-western 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.

1991 Activities/Accomplishments:

- A joint cruise with Soviet scientists to census polar bears along the ice edge has been delayed. More time is needed to arrange this effort, especially in light of recent developments in the former Soviet Union.

- Satellite telemetry data confirm the international nature of the bear population in the Bering and Chukchi Seas; 86 percent den in the Soviet Union. In addition, occurrences of denning in western Alaska and the Soviet Union by bears collared in the Beaufort Sea indicate a degree of inter-change between these two populations (formerly believed to be distinct), which is confirmed by preliminary results from genetic studies.

E. 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 ARC/INFO and IDRISI, two commercially available geographic information systems (GIS).

1991 Activities/Accomplishments:

- The VCR camera system was used successfully to collect limited "truth" data for the Soviet radar imagery data provided by Soviet research groups. Advanced Very High Resolution Radiometry (AVHRR) and the Soviet radar imagery have relatively coarse resolution. Fine-grain resolution images from Soviet radar were not available.

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, movements, mortality and reproduction of sea otters at Kodiak Island (by Alaska Fish and Wildlife Research Center staff) and Prince William Sound (by Cooperative Agreement with the University of Minnesota) 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. The resulting information could be useful if a zonal management program is proposed for Alaska sea otters.

1991 Activities/Accomplishments:

- Research on growth and condition of sea otters and sea otter censusing were completed in 1991.
- Otters at Kodiak Island may reach sexual maturity as young as age two.
- Preliminary results of mitochondrial DNA analysis indicate that sea otter populations from Alaska, California and the Soviet Union are separable, which supports the current subspeciation based on morphological variation.

B. Project Title and Summary:

Interactions between sea otters and fisheries in Alaska.

Crab sampling, dive surveys of benthic prey resources, observation of sea otter foraging activities and interaction with prey, and collection of data on the developing mariculture industry in Alaska are being used 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 and on population and habitat assessment; and (3) the recovery of the Prince William Sound sea otter population from the effects of the *Exxon Valdez* oil spill.

1991 Activities/Accomplishments:

- A study on interactions between sea otters and their prey was completed. Prey selection consisted of 56-67 percent clams, 19-25 percent mussels, and 2-4 percent sea urchins. Dietary diversity did not differ between sites recently occupied by sea otters and established habitat, but otters obtained larger energy intake per dive in newly occupied sites.
- Initial evaluation of a light aircraft (Piper PA-18 fixed wing) suggests that it may serve as a suitable platform for sea otter censuses; underwater capture of sea otters was successfully field tested.

C. Project Title and Summary:

Assess the fate of sea otters oiled and rehabilitated as a result of the *Exxon Valdez* oil spill.

The effectiveness of cleaning and rehabilitation efforts in returning oiled sea otters into the environment as functioning individuals in the population is being evaluated. Forty-five sea otters were selected, based on degree of oiling and method of rehabilitation. They were fitted with radio transmitters and have been tracked continuously since release. Survival and recruitment histories of rehabilitated

sea otters are compared with those of free-living sea otters in the area of the spill and with those in oil-free habitats.

1991 Activities/Accomplishments:

- Work on this study as a separate work unit was completed in 1991. Any continuing work has been incorporated into the work unit described in "D" below.
- Of the 45 radioed otters, 16 are still alive, 13 are known dead, 15 are missing, and one transmitter is known to have failed. Movements are greater than those of non-rehabilitated otters. Some returned to the Kenai Peninsula, where they were originally caught, after being released in Prince William Sound. Analysis indicates high adult mortality levels and significantly lower pupping rates compared to other estimates for Prince William Sound otters.

D. 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 unoled habitats; current populations are compared with the long-term data base collected on sea otters in the area.

1991 Activities/Accomplishments:

- Data from spring 1991 indicate mortality of yearling sea otters is higher in oiled than unoled areas. A relatively high proportion of prime age carcasses were recovered on beaches in the oiled area in 1990.
- Analysis of hematology and blood chemistry is ongoing.

E. 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 have been initiated on sea otters, polar bears and walruses.

1991 Activities/Accomplishments:

- Preliminary results suggest that California, Alaska and Soviet Union sea otter subspecies each have different mitochondrial DNA genotypes, as do Atlantic and Pacific walrus species. In both cases, the subspecies also show variable genotypes, which may be useful in stock identification.

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-USSR walrus survey results.

1991 Activities/Accomplishments:

- An opportunity to take part in a joint US/USSR pinniped research cruise delayed analysis and writing in this study. The 2-month long cruise on a Soviet ship allowed collection of extensive data on habitat selection, life history, contaminants and genetic relationships.
- Testing of alternate aerial survey techniques suggests that even alternate aerial survey techniques are unlikely to detect meaningful changes in population trends.
- Transmitters with new lighter housings and shorter external antennae than previous models were fitted on walruses in the Bering Sea in spring 1991 in cooperation with Soviet scientists; the transmitters have performed well.

4. 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 prob-

lems, such as support of Section 7 consultations on the Florida manatee (i.e., the Florida population of the West Indian manatee), and to track location, status and success of mitigation activities.

1991 Activities/Accomplishments:

- The QuickMAP “Desktop Mapping System” was enhanced for general distribution and field use. The system will be used for manatee locational and mortality data.
- Demonstrations were conducted at the National Sport Fish and Wildlife Restoration Conference and the Second National USFWS Geographic Information Systems Workshop.

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.

1991 Activities/Accomplishments:

- Decisions to restrict boats from key areas in eastern Florida, based in large part on tracking data, were made by the State of Florida.
- Final stages of the Hobe Sound aquatic vegetation field and laboratory research were completed and a draft report is pending completion.
- Initial planning of a manatee population biology workshop in FY 1992 to evaluate life history data and develop population models was completed by the Florida Cooperative Fish and Wildlife Research Unit.
- A dugong survey of Palau was completed. A brief account of the survey and its results is given in the “Status Report-Dugong” section of this annual report.

C. Project Title and Summary:

Manatee movements and foraging in Cumberland Sound and adjacent waters.

A study conducted by the Florida Cooperative Fish and Wildlife Research Unit uses conventional, very high frequency (VHF) telemetry on manatees in Cumberland Sound, Georgia, to assess habitat use and duration of stay in the area. Particular attention was focused on the effects of vessel traffic (military, dredging, recreational and commercial) on manatee habitat use, especially foraging behavior.

1991 Activities/Accomplishments:

- This project was completed in FY 1991.
- Georgia is a more important manatee habitat than formerly believed and sites are occupied by manatees normally during the warm season. Manatees feed primarily on *Spartina alterniflora* and *Ulva* spp. Results suggest that dredging and support vessels may disturb feeding manatees.

5. 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 these 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.

1991 Activities/Accomplishments:

- Both the fall 1990 and spring 1991 sea otter censuses in California indicated that the population continues to grow at about 5-7 percent per annum. These data indicate that the 10 percent drop in sea otter numbers based on the spring 1990 census was probably in error.
- The use of Morro Bay by sea otters continues to decline, while the use of the Shell Beach area continues to increase.

B. Project Title and Summary:

Interactions between sea otters and nearshore ecological communities.

Monthly, seasonal and 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.

1991 Activities/Accomplishments:

- Although sea otters at San Nicolas Island are regularly observed eating benthic species known to be of ecological or economic importance, no element of nearshore communities at the island has shown changes clearly related to predation by sea otters.
- Studies of red abalone populations indicate that human harvest may be as effective as sea otter predation in depleting local abalone stocks.

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 grows and reaches 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. Consequently, some of the research activities to be conducted in 1992 will be phased out. The focus of efforts now will be on monitoring sea otters and habitat changes at San Nicolas Island.

1991 Activities/Accomplishments:

- As of September 1991, there were about 12 independent sea otters at San Nicolas Island. The population has remained stable since fall 1989. Since the beginning of translocation in 1987, 139 sea otters have been released at the island. Nine are known dead and 30 have returned to the mainland; the fate of the remaining animals is unknown.

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 National Marine Fisheries Service (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 a NMFS/Service Memorandum of Understanding, the Service retains authority over those investigations that involve endangered or threatened species under the Department's jurisdiction; violations are referred to the Office of the Solicitor for civil action or the Department of Justice for criminal enforcement action.

In 1991, a California man, who was convicted of violation of both the Endangered Species Act (ESA) and the Act for take of California sea otters in 1988, violated conditions of court-ordered probation by possessing and displaying a firearm. The man was employed as a deck hand on a commercial fishing vessel and was using the firearm in an attempt to take seals. The investigation resulted in revocation of probation and a jail term.

Another California man was investigated for repeatedly attempting to run over a California sea otter with a jet ski. The violation was observed by numerous individuals. At least one sea otter was injured. The case has been presented to the U.S. Attorney for prosecution.

Approximately 55 separate seizures of marine mammals and marine mammal products were made during Calendar Year 1991 by Service special agents and wildlife inspectors in the Service's Western Region. The seizures ranged in size from a single whale tooth carving to a seizure in Seattle of 63 sea otter pelts.

The Service's Alaska Region was heavily involved in the second year of an undercover investigation involving the trading of drugs for ivory, illegal sale of ivory and wasteful take of walrus. The covert portion of the case was completed in early 1992 with the arrest of 12 persons. Seventeen summons were issued and several search warrants were executed. It is expected that 75 or more defendants will be prosecuted. In the course of the investigation approximately 700 pounds of illegal ivory, five polar bear hides, sea otter skins and drugs were purchased. During the "takedown" 115 walrus tusks, eight headmounts, two polar bear hides, sea otter skins, 16 baleen fronds, other wildlife, five cars, marijuana and cocaine were seized.

In the summer of 1991 forensics experts from the Service's forensics lab studied the headless walrus problem. They visited several beaches along the northwest coast of Alaska and determined that approximately 75 percent of the carcasses they examined had the head removed prior to the carcass washing up on the beach. Investigations continue regarding the problem with the wasteful take of walrus.

Also during the summer of 1991 several Service biologists in Diomedes observed 11 Native hunters unload 85-90 walrus heads and very little meat from a boat. This case is still being investigated. An Alaskan company that specializes in importing Russian products is being prosecuted for smuggling marine mammal products. There is an increase in violations that involve the importation of marine mammal products from Russia. This is due in part to increased travel to Russia by tourists and Russian Natives visiting Alaska.

An increase in funds during 1991 allowed the Region to reopen its Nome Law Enforcement Station. The expanded law enforcement presence (the Nome Agent was involved in all of the Alaska cases just mentioned) resulted in an increasing number of contacts with Alaskan Natives. Many of the Native elders are seriously concerned about the image of Alaskan Native hunters created by these cases and fear that such illegal actions could affect the Native exemption under the Act. There has been increasing cooperation by Alaskan Natives in an attempt to curtail or eliminate unlawful activities. One violation involved 5 Native hunters in Wainwright who killed 11 walrus and took only the ivory. The subjects were all prosecuted for "wasteful take" of a marine mammal and were fined. A second violation was reported involving 9 Natives taking a very large number of walrus and wasting almost all of the meat. This case is still being investigated.

Permits and Registrations

The Act prohibits the take or import of marine mammals and marine mammal products although exceptions may be made under permit for scientific research, public display or to enhance the survival or recovery of a species or stock. Registered agent/tannery permits may be issued to authorize the buying or selling of raw marine mammal parts or products by non-Alaska Natives (i.e., persons other than Alaskan Indians, Eskimos or Aleuts) or to enable marine mammal hides to be tanned to facilitate trade of their products among Alaskan Natives.

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. These provisions are implemented 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 1991, two new permits were issued for scientific research and six permits were renewed and/or amended. One permit was issued for public display. Eight parties were registered, or renewed registration, as agents and/or tanneries.

The following is a brief description of permit actions taken in 1991.

Scientific Research Permits

1. PRT-684532, Fish and Wildlife Service, Marine Mammal Section, San Simeon, California, was renewed 3/4/91 through 2/28/94 authorizing continuation of take activities and export of parts of salvaged dead West Indian manatees. Authorized activities include: (1) the attachment of peduncle belt and radio transmitter assembly and/or tetracycline mark up to 60 manatees annually (up to 6 takes per manatee in order to attach, adjust or remove the peduncle belt, tether and radio transmitter assembly); (2) tail-notch up to 27 free ranging human-accustomed manatees annually and an unspecified number of captive manatees; (3) freeze-brand and administer tetracycline on up to 10 injured and rescued manatees annually; (4) conduct non-harmful behavioral and physiological studies on captive manatees; and (5) collect dead and injured manatees. The purpose of the research is to obtain important information on manatee movements and reproductive biology in order to develop sound management plans necessary for the recovery of the species.
2. PRT-740507, Fish and Wildlife Service, Alaska Fish and Wildlife Research Center, Anchorage, Alaska, was amended on 3/19/91 and 5/15/91. The first amendment authorizes the reimport of parts of dead otters exposed to oil during the *Exxon Valdez* oil spill from Marine World, Japan, and Vancouver Aquarium, Canada. Such samples would be used to study the long-term effects of oil exposure by conducting histological examination and, if feasible, toxicological assays (measuring hydrocarbon residues). The first amendment also authorizes the import of tissue samples taken from dead otters in Canada and USSR for use in a genetics study. Tissue samples will be analyzed using nuclear and mitochondrial DNA to provide genetic profiles of the different otter subpopulations. The second amendment authorizes the extension of the capture area to include southeast

Alaska (Baranof Island, in the Sitka area) in order to obtain an additional set of control samples and authorizes the collection of urine samples to more accurately assess potential organ dysfunction, which may be related to oil exposure, and biopsy oral and vaginal lesions, where present, for virology assays.

3. PRT-690715, Fish and Wildlife Service, Alaska Fish and Wildlife Research Center, Anchorage, Alaska was renewed 3/12/91 through 2/29/92 authorizing the following take activities on up to 17 walrus: chemically immobilize, tag (double tag on flippers), radio-tag with satellite-linked transmitters, and administer oxytetracycline HCL (for protection from secondary pneumonia) and mark teeth for future identification. The permit also authorizes the following activities with an unspecified number of walrus: (1) collection of biological samples from walrus found dead or that die during permitted activities; (2) import of biological samples from Greenland, Canada, Norway and the Soviet Union; and (3) recapture of tagged walrus for replacement of malfunctioning radio-transmitters. In addition, as part of the radio-tagging process an unspecified number of animals may be inadvertently harassed during subsequent radio-tracking flights. The purpose of this research is to aid in the understanding of population dynamics of the species.
4. PRT-757159, Fish and Wildlife Service, Alaska Fish and Wildlife Research Center, Anchorage, Alaska, was issued 7/9/91 through 6/30/93 authorizing capture, blood and tissue sample, flipper tag, subcutaneously implant with a transponder chip on up to 300 Alaskan sea otters. The purpose of the research is to analyze genetic markers to quantify the amount of genetic differentiation among populations and subspecies. The permit was subsequently amended on 8/2/91 to authorize the sedation of sea otters prior to collecting blood samples.
5. PRT-717015, Natural History Museum of Los Angeles, Los Angeles, California, is a permit issued jointly by the Service and the NMFS. The permit was renewed by the two agencies on 4/23/91 through 4/30/96 and authorizes the importation and exportation of dead, salvaged material of all Cetacea, Pinnipedia, Sirenia, and marine otters.
6. PRT-740037, Ebasco Environmental, Bellevue, Washington, was renewed 6/25/91 through 6/30/92 authorizing aerial surveys and vessel observations of walrus to develop information for determining walrus abundance, distribution

and behavior relative to offshore oil and gas exploration and associated activities.

7. PRT-761873, Mote Marine Laboratory, Sarasota, Florida, was issued 10/18/91 through 10/31/93 authorizing them to conduct hearing studies on two male and two female captive West Indian manatees.
8. PRT-685009, Mote Marine Laboratory, Sarasota, Florida, is a permit issued jointly by the Service and the NMFS. The permit was renewed by the two agencies on 10/18/91 and 10/16/91, respectively, through 4/30/93 authorizing aerial surveys of West Indian manatees and bottlenosed dolphins.

Public Display Permits

1. PRT-751849, Chicago Zoological Society, Brookfield, Illinois, was issued 2/20/91 authorizing the import of one male and one female walrus from the Moscow Zoo for the purpose of medical treatment and public display. Both animals suffered from chronic sinusitis.

Registered Agent/Tannery Permits

1. PRT-755879, The Cutting Edge, Bethel, Alaska, was registered as an agent on 1/29/91.
2. PRT-704234, The Bear's Den, Olympia, Washington, was renewed registration as an agent on 9/18/91.
3. PRT-683423, New Method Fur Dressing Co., S. San Francisco, California, was renewed registration as a tannery on 11/27/91.
4. PRT-723077, Alaska Fur Exchange, Anchorage, Alaska, was renewed registration as an agent on 8/8/91.
5. PRT-757291, Rob Lupton, Anchorage, Alaska, was registered as an agent on 5/1/91.
6. PRT-754639, Inua — The Spirit of Alaska, Homer, Alaska, was registered as an agent on 4/17/91.
7. PRT-728139, James F. Reiss, Palmer, Alaska, was renewed registration as an agent on 7/18/91.
8. PRT-756124, Shishmaref Traditional Industries, Shishmaref, Alaska, was registered as a tannery on 6/3/91.

ESA Listing Actions

On December 11, 1990, the NMFS, which has jurisdiction for the Indus River dolphin (*Platinista minor*), published in the *Federal Register* a final determination that the species warrants classification as endangered under the ESA. The Service is responsible for the actual addition of all species to the List of Endangered and Threatened Wildlife in 50 CFR 17.11(h). Accordingly, on January 14, 1991, the Service published a final rule in the *Federal Register* (at 56 FR 1463) adding the Indus River dolphin to the list.

International Activities

US-USSR Environmental Agreement: Marine Mammal Project

The Service, in partnership with the NMFS, USSR Ministry of Fisheries, and the USSR Academy of Sciences conducted a diverse program of laboratory and field research in 1991.

During February and March of 1991, three USSR biologists visited the Service's Marine Mammals Management Office in Anchorage, Alaska, to work with four American biologists to conclude the data analysis and report writing associated with the 1990 US-USSR cooperative aerial walrus survey. A draft joint report of survey results was developed; the final report with both English and Russian texts will be available in 1992. Three Americans participated in a joint cruise on a Soviet vessel to study certain pinipeds, including Pacific walruses, in American and Soviet waters for seven weeks in March-May. More detailed accounts of these cooperative efforts are included in the *Walrus* section of this Annual Report.

The 3rd Joint US-USSR Sea Otter Symposium was held from September 9-15, 1991, in Petropavlovsk, Kamchatka. The six-member United States delegation included staff from the Service's Office of Research, and Western and Alaska Regions; a staff member from the Monterey Bay Aquarium, California, was also part of the delegation. Papers on a variety of topics were presented including the status of sea otter populations in California, Alaska and Russia, as well as results from various research projects. The recent die-off of sea otters at Medny Islands, Russia, was discussed at length. Tentative plans were made for future exchanges. The 4th Joint US-USSR Sea Otter Symposium is scheduled to be held in Alaska in 1993.



A polar bear sow waits for her cub. U.S. Fish and Wildlife Service photo.

The eleventh US-USSR Marine Mammal Working Group met at the Pacific Research Institute of Fisheries and Oceanography in Vladivostok, Russia, from September 17-26, 1991. A protocol was signed on September 26, 1991, that identifies proposed cooperative exchanges for the next one and one-half years. The seven member American delegation included two Service biologists from Alaska.

Polar Bear Activities

Service biologists from management and research continue to participate with Russian biologists in the cooperative study of polar bears of the Chukchi and Bering Seas area. Russian scientists have indicated that they intend to list polar bear populations in the Chukotka Region as recovered, allowing polar bear hunting to be reinstated. Hunting, promoted as a management tool, will allow for the control of problem bears in coastal settlements; hunting of polar bear was banned in 1956 and inhabitants of coastal settlements are currently encountering greater numbers of problem bears.

The United States shares the Chukchi Sea polar bear population with Russia and both countries recognize the need to develop a cooperative management or allocation agreement. Discussions continue between Russia and the United States on these management issues. It is vitally important that the Service develop accurate information on the population distribution, abundance and trend for the Chukchi Sea region.

The Service participated in the Canadian Federal Provincial Technical Committee for Polar Bear Research and Management in Maple, Ontario, on February 5-6, 1991. The annual meeting promotes the exchange of information on various research and management activities. The group generally

provides an analytical review and discussion of emerging techniques, methodologies, or research results prior to publication. Topics discussed at previous meetings include population modeling, evaluation of census methodologies, and development of effectively targeted conservation and educational materials.

Status Reports

Polar Bear

Harvest Summary

The Service continued to collect information from polar bears taken by Native hunters in coastal villages for subsistence purposes. The Alaska kill during the 1990/91 period totaled 74 bears comprised of 47 males, 11 females, and 16 animals for which the sex was unknown [Table 1]. The kill was 42 percent below the 10-year average (127 bears) and the lowest recorded since the Service began a harvest monitoring program for this species in 1980. The sex ratio of known sex animals was 4:1, males to females.

Of those polar bears for which the month of take is known, the harvest occurred primarily from December through May (91 percent); fifty-five percent of the harvest occurred in the 3 month period from March to May [Table 2]. Age analysis for bears killed during this reporting period is ongoing and will be included in the Calendar Year 1992 report.

Ages compiled for polar bears killed during the 1989/90 harvest season, where N is the number of animals and S.D. is the standard deviation, are as follows: male average age, 6.1 years (N=45, S.D.=4.6); female average age, 8.2 years (N=19, S.D.=4.1) [Table 3]. The age class composition of the 1989/90 harvest was: adults, 71 percent (N=33); subadults, 20 percent (N=9); and cubs, 9 percent (N=4). The harvest of adults was greater than the long-term average (i.e., 50 percent), while the number of dependent cubs in the harvest was below the long-term average (i.e., 25 percent).

As reported for 1990, specimen material continues to be collected from the harvest monitoring program and analyzed to: (1) determine contaminant levels; and (2) assess isotopic carbon levels of claw materials to determine if hunters are harvesting bears from different stocks and, if so, at what rates.

During 1990/91, 79 percent of the hides and 70 percent of the skulls from known harvested bears were tagged. Polar bear hides and skulls are being tagged in a more timely manner than during the inception of the Service's mandatory Marking, Tagging and Reporting Program as evidenced by comparison of kill dates to the dates when hides and/or skulls were tagged. While complete sex and age information is the goal of this Program, improvements in reporting are necessary. The quality of data collected from this program relies upon the performance of local taggers combined with the ability of Service personnel to monitor and provide oversight to ensure timely and accurate data collection.

Polar Bear Management Agreement, Beaufort Sea

The 1990/91 season was the third year of implementing 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.

Table 1. Alaska Polar Bear Harvest: July 1, 1990, to June 30, 1991.

Village	Male	Female	Unknown	Total
Kaktovik*	-	-	2	2
Nuiqsut*	-	-	-	-
Barrow*	10	1	-	11
Atkasuk*	-	-	-	-
Wainwright*	3	2	-	5
Point Lay	1	-	1	2
Point Hope	5	1	10	16
Kivalina	1	2	-	3
Shishmaref	6	-	-	6
Wales	3	-	-	3
Diomedede	-	-	3	3
Savoonga	9	3	-	12
Gambell	9	2	-	11
Total	47	11	16	74
Percent of Total	(63.5)	(14.9)	(21.6)	(100)

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

During the reporting period 18 polar bears were harvested by North Slope residents of Kaktovik (2), Barrow (11) and Wainwright (5) [Table 4]. The number of bears harvested by the three Alaskan villages party to the Agreement was the lowest recorded since the Agreement went into effect [Table 5]. All villages harvested fewer bears than their long-term average and below the harvest allocation (38) of the Agreement. Likewise, Canadian hunters harvested fewer bears (15) than their allocation (38).

The ratio of male to female bears, as identified on marking and tagging forms, was 4:1. Sex was unknown for 2 bears harvested during this period. Age analysis is ongoing and will be reported next year. Average ages of polar bears harvested on the North Slope compiled for the previous year, 1989/90, are as follows: males, 7.7 years (N=7,

S.D.=4.8); and females, 3.0 years (N=1, S.D.=not applicable) [Table 3].

Complete sex and age information was available for 44 percent (8/18) of harvested bears: Kaktovik, 0 percent (0/2); Barrow, 45 percent (5/11); and Wainwright, 60 percent (3/5). Continued improvement in complete reporting of data from harvested bears is necessary, particularly age information obtained from premolar teeth of tagged skulls.

Polar bears were harvested during seven months of the year. One bear was taken in August outside of the season prescribed by the agreement [Table 6].

The peak of the harvest occurred during November and December when eight bears (44 percent) were killed. The number of hunters killing more than a single bear was reduced, from previous years, to one person. That individual killed 2 bears.

Table 2. Monthly Polar Bear Harvest, Alaska: July 1, 1990 to June 30, 1991.

Village	Month												Total
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
Kaktovik*	-	-	-	-	-	2	-	-	-	-	-	-	2
Barrow*	-	1	-	-	3	1	-	-	1	3	2	-	11
Wainwright*	-	-	-	-	-	2	1	-	-	-	-	-	3
Point Lay	-	-	-	-	-	1	-	-	-	-	-	-	1
Point Hope	-	-	-	-	-	1	-	-	-	6	3	-	10
Kivalina	-	-	-	-	-	-	-	-	-	1	-	-	1
Shishmaref	-	-	-	-	-	-	3	-	1	-	-	-	4
Wales	-	-	-	-	-	-	3	-	-	-	-	-	3
Savoonga	-	-	-	-	-	-	-	5	3	4	-	-	12
Gambell	-	-	-	-	-	-	-	2	4	1	3	1	11
Total	-	1	-	-	3	7	7	7	9	15	8	1	58
Percent	-	2	-	-	5	12	12	12	15	26	14	2	100

* Denotes villages party to the IGC/NSB management agreement. Month of kill not recorded for 16 animals.

Table 3. Average Ages of Harvested Polar Bears, 1989/90.

Area	Age	Sex	N	S.D.
Alaska Total	6.1	Male	(45)	4.6
	8.2	Female	(19)	4.1
North Slope	7.7	Male	(7)	4.8
	3.0	Female	(1)	n/a
Western Region	5.8	Male	(38)	4.6
	8.5	Female	(18)	4.1

n/a— not applicable

Highlights of the annual IGC/NSB meeting of Technical Advisors and Joint Commissioners follow:

- only 33 bears of a 76 bear allocation were harvested—well under the allocation guidelines (Alaska 18/38, NWT 15/38);
- the Joint Commissioners decided not to increase quotas;
- NSB Joint Commissioners encouraged the IGC to explore alternate means of accommodating the request to raise the Inuvik’s quota by one bear without increasing the quota beyond 38 bears;
- Joint Commissioners acknowledged a need to continue to inform hunters of the terms of the Agreement and to develop hunter educational materials, particularly in an effort to reduce the number of females harvested;
- Joint Commissioners urged continued cooperation between hunters and taggers to ensure acquisition of accurate and complete kill data;

Table 4. Alaska Polar Bear Harvest, Southern Beaufort Sea, 1990/91.

Sex	Village			Total
	Kaktovik	Barrow	Wainwright	
Male	-	10	3	13
Female	-	1	2	3
Unknown	2	-	-	2
Totals	2	11	5	18

Harvest season extends from July 1, 1990, to June 30, 1991.

Table 5. Polar Bear Harvest from the Eastern Beaufort Sea 1988–91.

	1988/89			1989/90			1990/91		
	Male	Female	Unk	Male	Female	Unk	Male	Female	Unk
Kaktovik	5	2	3	1	-	-	-	-	2
Nuiqsut	2	-	-	-	-	-	-	-	-
Barrow	18	1	10	10	4	1	10	1	-
Atqasuk	1	1	-	-	-	-	-	-	-
Wainwright	9	2	4	7	-	-	3	2	-
Industry	-	-	-	-	1	-	-	-	-
Subtotals	35	6	17	18	5	1	13	3	2
Totals		58			24			18	

Table 6. Monthly Polar Bear Harvest, Southern Beaufort Sea 1990/91.

Village	Month												Total	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Kaktovik	-	-	-	-	-	-	-	-	-	-	-	-	2	2
Barrow	-	-	1	3	2	-	-	1	-	-	-	3	1	11
Wainwright	1	-	-	-	-	-	-	-	-	-	-	-	2	3
Totals	1	-	1	3	2	-	-	1	-	-	-	3	5	16
Percent	6.2	-	6.2	18.8	12.6	-	-	6.2	-	-	-	18.8	31.2	100

Harvest month was unrecorded for 2 bears.

- a 5-year review of the Agreement will be conducted. Review of the population status and relationship between sustainable yield estimates and existing quotas will be considered. The parties will also consider the frequency and nature of future meetings or information exchanges.
- Joint Commissioners acknowledged that a recommendation arising from the 1990 Technical Committee meeting, to write a letter of concern from IGC and NSB Joint Commissions to appropriate U.S. and Canadian officials regarding Beaufort Sea oil and gas exploration and development activities remained appropriate. The group will renew drafting of a letter; the IGC has the lead.

Management Planning

The development of a polar bear management plan is being renewed. Members of the polar bear planning team have been notified, with meetings expected to follow. The Marine Mammal Commission (MMC) is assisting the Service by preparing a draft plan for consideration and guidance as the Service develops its management plan. The tentative completion date for the Service's plan is December 1992. The proposed Russian renewal of harvesting polar bears from the Chukchi Sea stock will be considered in the planning process. United States compliance with the International Agreement on the Conservation of Polar Bears (1976) will also be considered in identifying management options or needs. Numerous other factors will also be considered in developing guidance contained within the management plan. Management options that may be identified in the plan could require enabling legislation through amendments to the Act prior to their implementation.

Industry: Bear/Human Interactions

Oil and gas companies operating in the Beaufort Sea are interested in ensuring that future polar bear/human interactions are minimized. Technical assistance is provided by reviewing operator prepared site-specific polar bear interaction plans for completeness; development and implementation of interaction plans by industry is voluntary in the absence of incidental, unintentional small take regulations and Letters of Authorization. Industry representatives are advised they are potentially liable to penalties in the Act for takes in the absence of regulations and Letters of Authorization. The Service and Alaska Department of Fish and Game

(ADF&G) employees contributed to environmental awareness educational materials, and have provided on-site training on drilling platforms in the Beaufort Sea designed to inform operators of procedures to detect and avoid encounters with polar bears.

The Service continues to work through the Minerals Management Service's (MMS) Regional Technical Working Group to identify studies germane to offshore industrial exploration and production impact assessment. A MMS contract was awarded to the consulting firm, LGL, to prepare a handbook or guideline manual for offshore oil industry site design, layout, and operations to minimize human/polar bear interactions. Within the manual will be a step down protocol for dealing with problem bear situations. Industry may not legally deter polar bears in the absence of specific incidental, unintentional small take regulations and Letters of Authorization.

A Service representative participated in an inter-agency "table top" oil spill drill which simulated a large scale spill (blowout) in the Chukchi Sea. The goal of the exercise was to develop practical skills necessary to react to a spill in a timely manner and to identify response areas requiring improvement.

AMOCO Corporation contributed \$100,000 to the National Fish and Wildlife Foundation in support of polar bear studies in Alaska. The funds (\$97,000) transferred to the Service, will be used to assist ongoing research activities to determine the rate of exchange for polar bears between the Beaufort and Chukchi Seas, and to evaluate distribution of polar bears related to ice types. Results of these endeavors will allow for a more accurate assessment of potential polar bear distribution or interactions at offshore industrial locations and will also assist in evaluating data collected from future aerial surveys.

Meetings

The Service provided technical advice to the North Slope Borough's Joint Commissioners on the Management Agreement for Polar Bears of the Southern Beaufort Sea at the annual meeting held November 25-26, 1991, in Inuvik, Northwest Territories. Results and recommendations are discussed above. Immediately preceding the Technical Advisors meeting, November 21-22, 1991, the Service presented members of the NSB Fish and Game Management Committee with a polar bear management status report.

Service representatives attended and participated in a Rural Alaska Community Action Program, Inc., Marine Mammal Conference, December 10-11,

1991. The conference was billed as an "agency audit," where various Federal and State agencies provided status reports on their activities related to marine mammal management and research programs. The conference served as an effective communication forum between Native marine mammal hunting/user groups and the agencies. An Alaskan Native caucus on marine mammals followed the conference to identify issues of concern.

Sea Otter-Alaska

Management activities for sea otters in Alaska revolved around four primary concerns in 1991: (1) the Interim Rule prohibiting the taking of sea otters by Alaskan Natives for creating and selling handicrafts and clothing to non-Natives; (2) surveys of sea otters in the Aleutian Islands and southeastern Alaska; (3) damage assessment associated with the *Exxon Valdez* oil spill; and (4) management planning.

Interim Rule on Handicrafts and Clothing

On April 20, 1990, the Service published in the Federal Register, 55 FR 14973, an Interim Rule that prohibited the taking of sea otters by Alaska Natives for use in creating and selling handicrafts and clothing to non-Natives. The Service interpreted the intent of Congress in passing the Act to be to preserve existing Native uses of marine mammals rather than promote the expansion of Alaska Native arts and craft industries or the creation of new industries. On May 30, 1990, the Alaska Sea Otter Commission (ASOC) and Ilarion Pletnikoff, on behalf of Alaskan Natives, filed civil suit against the Department of the Interior in U.S. District Court contending that the Interim Rule violated the Act and its implementing regulations in 50 CFR Part 18. On July 16, 1991, Judge Russell Holland ruled in favor of the ASOC, thereby nullifying the Interim Rule. In his decision, Judge Holland also reversed an earlier opinion of his own, by ruling that the Service's regulation defining an authentic article of Native handicrafts as one that was produced on or before December 21, 1972, was inconsistent with the Act.

Sea Otter Surveys

After the preliminary survey of sea otters in the Aleutian Islands in summer 1990, the Aleutian Islands became the principal survey objective for 1991. Aircraft selection and logistic preparations were well in place for a July 1, 1991, departure. However, the Interior Department's Office of

Aircraft Service's Turbine Goose, N780, was in poor mechanical condition, necessitating extensive repairs, resulting in a departure delay until July 28. Ensuing poor weather and the departure of ground-truthing support resulted in the cancellation of the survey. The survey is now planned for spring 1992.

The Barrier Islands population of sea otters in southeastern Alaska was surveyed from skiffs in September 1991. The 185 sea otters counted was substantially fewer than both the survey results from 1988, and the expected population based on projected rates of increase. It is not clear whether the population has declined or if the survey crew missed a substantial number of sea otters during the survey. Some legal and illegal harvesting of sea otters has occurred in the area. Additional surveys are needed to clarify this population's status.

Exxon Valdez Oil Spill

As part of the Natural Resources Damage Assessment, combined sea otter and marine bird surveys were continued in Prince William Sound. The objectives of these surveys were to determine the distribution and abundance of sea otters in Prince William Sound, and to determine if additional injury still was occurring to the population. In 1991 surveys were conducted in March and July. Proposals were submitted to continue the boat-based surveys of sea otters and marine birds in Prince William Sound as part of the oil spill restoration.

Management Planning

On January 25, 1991, the Service initiated the management planning process for sea otters by holding an introductory planning meeting in Anchorage to discuss management issues and review a draft outline of the plan. Representatives of the ASOC, ADF&G, Greenpeace, Cordova District Fishermen United, and the University of Alaska participated. Management issues identified by the group included habitat protection; oil, gas and hazardous substances; timber harvesting; competition with humans for shellfish resources; mariculture; incidental take in commercial fishing operations; coastal development; and water quality. The outline for the plan was modified based on the discussion and distributed in May. The Service is currently working on a draft of the management plan.

In April at their annual meeting, the MMC offered to produce a first draft of a management plan for sea otters in Alaska for the Service. Consequently, on September 25, 1991, the MMC and the Service jointly held an additional meeting in Anchorage,

Alaska, to obtain input for the management plan. The Service intends to incorporate relevant parts of the MMC's document into its draft management plan before submitting it to the public for comment.

Other Issues

Staff from the Service's Marine Mammals Management office in Anchorage, Alaska, and its central office in Arlington, Virginia, continue to participate on a NMFS Marine Mammal Task Group charged with developing a proposed regime to regulate the incidental take of marine mammals in commercial fishing operations. A Draft Legislative Environmental Impact Statement (DLEIS) was published in June 1991, and a subsequent draft of the proposal, based on comments received on the DLEIS, was distributed in November 1991. A proposal is scheduled to be submitted to Congress early in 1992. (Note: As of early June 1992, the NMFS had not submitted their proposed management regime to Congress.)

Walrus

Population Surveys

Cooperative fall surveys of the shared Pacific walrus population have been conducted jointly by the U.S. and USSR at 5 year intervals since 1975 under terms of the 1972 "Agreement on Cooperation in the Field of Environmental Protection." In anticipation of the 1990 survey, joint studies of survey design and methodology were conducted in 1989, and several meetings were held to plan survey logistics during 1990. The degree of coordination between the two nations in the timing and design of the survey was unprecedented with the survey being viewed as the first fully cooperative survey completed to date. Cooperative work continued in 1991 when three Soviet biologists traveled to Anchorage for a four-week session devoted to further data exchange and cooperative data analysis and report writing. A draft survey report was prepared during that visit with a final version to be completed in early 1992.

The joint 1990 survey was conducted between August and October and consisted of two phases: unilaterally flown surveys of walrus on the coastal haulout sites of each nation and a fully coordinated survey of walrus in the pack ice of the Chukchi Sea. A majority of the walrus seen (134,150) were concentrated on Wrangel Island and the northern Chukotka coast during the entire survey period.

Smaller numbers of walrus were counted on the land sites overflown (USA haulouts, 7,522; Kamchatka Peninsula, 11,995; southern Chukotka, 8,380), estimated in open water (western Chukchi Sea, 13,137; Long Strait, 9,366), or estimated in the pack ice of the Chukchi Sea (16,489).

Ice coverage approached a near record minimum in the Chukchi Sea and a record minimum in the East Siberian Sea during the survey. The pack ice was positioned far to the north (100-300 kilometers farther north than more typical years) over the deep water of the continental slope and far from the shallower waters of the Chukchi Sea typically utilized during the fall by feeding walrus. These conditions likely influenced walrus distribution and accounted for very low numbers of walrus overflown in the pack ice. As a result, the joint survey produced a minimal estimate (201,039) of the total population size which is not comparable to estimates obtained from the prior cooperative surveys.

One goal of the Act is to maintain populations at their Optimum Sustainable Population (OSP) level. The Act defines OSP as a range of population sizes between carrying capacity at the upper end and maximum net productivity at the lower end. The determination of population status relative to OSP is important because it is only when a population is found to be below OSP and the species is by definition declared "depleted" that a variety of management measures may be implemented with respect to takings under Section 101(b) of the Act to encourage the population to return to a level within its OSP range.

The precise range of OSP has not been determined for the Pacific walrus. In 1975 the population was determined to be above the lower bound of OSP based on an estimated population size of 170,000 (1972 survey results). Subsequent surveys in 1975, 1980, and 1985 produced population estimates of 221,360, 246,140, and 232,518 respectively. Unfortunately, confidence limits for all American survey data are unacceptably large (Standard Deviations of at least 30 percent) and the Soviets have not given confidence limits for their total estimates. Because the 1990 survey was conducted in a year of anomalous ice conditions, the estimate is not comparable to prior estimates obtained in more typical ice years.

The Service notes the minimal estimate of 201,039 derived from the 1990 survey infers the population is still above the lower bound of OSP based on the 1975 decision, especially because the 1990 results are considered an extreme underestimate of the true total population size.

The inability to acquire an estimate useful for assessing walrus population trends based on 1990 data highlights the need to conduct cooperative surveys at more frequent intervals than the previously followed five-year schedule. Many groups have commented that the five-year interval between surveys and unacceptably wide confidence limits of the population estimates obtained jeopardizes the Service's ability to work cooperatively with Native user groups and the conservation community in the implementation of timely management measures designed to maintain the population at acceptable levels. Soviet and American scientists agree another cooperative survey should be conducted as soon as environmental and fiscal conditions permit.

Other Surveys

From March 28 to May 21, three American biologists joined four Soviet scientists aboard the USSR marine mammal harvest vessel *ZRS Zaslono* for a cooperative pinniped research cruise in the Bering Sea. The goal of this cruise was to conduct joint studies of the reproductive status, general physical condition and feeding ecology of certain pinnipeds, including walrus, for determination of their present status in comparison with data collected from previous cruises.

Pacific walrus were harvested (265 females, 241 males) in four primary regions: 130 in northwestern Bristol Bay south of Nunivak Island, 186 off the Koryak coast, 60 southeast of St. Lawrence Island, and 130 in Anadyr Gulf. In U.S. waters, 197 walrus and 159 bearded seals were taken under the NMFS issued (and Service cosigned) marine mammal research permit 734 to the All-Union Scientific Research Institute of Marine Fisheries and Oceanography.

Samples collected from harvested walrus included stomach contents, reproductive tracts, teeth for aging, muscle tissue for genetic analysis, and a variety of tissues for histopathological analysis. Samples for contaminants analysis included tissues collected from 220 walrus. Stomach content samples were collected from 24 walrus. Skulls from six walrus were taken for educational display.

Biologists observed hunting techniques and effectiveness (37 observer-days), and age-sex composition (2,417 walrus in 154 groups) from the small hunting boats. Satellite-linked transmitters were placed on seven adult female walrus; one male was tagged with a VHF radio tag. A cruise report was prepared; data collected on this cruise is being incorporated into several review papers being prepared jointly for publication by scientists from both nations.

Habitat Issues

In 1989, the Service worked with the ADF&G, the Eskimo Walrus Commission, the North Pacific Fishery Management Council (NPFMC), and the NMFS to implement a two year, seasonal closure restricting yellow fin sole fishing within 12 nautical miles of walrus haulout sites in northern Bristol Bay. This action was taken because compelling circumstantial evidence indicated that yellow fin sole fishery operations may have been causing airborne and aquatic acoustic disturbance to walrus. These agencies were concerned that the level or frequency of this disturbance was associated with the significant decline (of up to 60 percent) in the number of walrus reported hauling out at Round Island, the Twins, and Cape Peirce.

Analysis of data collected during the two year closure indicated the closure was having positive effects on walrus utilization of these haulout sites and that an extension of the closure was warranted. Therefore, the Service recommended at the August 1991 NPFMC meeting that the NMFS continue the 12 nautical mile closure indefinitely. The NMFS decision was expected in early 1992.



Walrus massed on a Bristol Bay haulout. U.S. Fish and Wildlife Service photo.

Management Planning

The Service began to develop a 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 and the 1990 U.S.-USSR population survey). The Service has made development of a walrus management plan during the 1992 calendar year a high priority task.

Harvest Monitoring

The Service has monitored the spring walrus harvest in six villages in the Bering Sea since 1979. The Service was unable to field a Harvest Monitoring Program in 1990 and 1991 due to funding constraints. In the past, the Harvest Monitoring Program not only recorded the level of take in the major hunting villages in Alaska, but also collected a broad array of biological samples for analysis of reproductive, contaminant and age determination data. These data provided a continuing assessment of the structure of the harvest and condition of the resource. These data cannot be collected through the Service's parallel Marking, Tagging and Reporting Program. The Service expects to reinstate the Harvest Monitoring Program in the spring of the 1992 harvest season.

Contaminants Monitoring

Between 1986 and 1989, Service monitors continued a 1981-1984 baseline study of contaminant levels in tissues of Pacific walrus harvested in the spring by Alaskan Natives. In 1991 the Service completed an analysis of samples obtained during the study period from 56 walrus collected by hunters from the Bering Sea villages of Diomedea, Gambell and Savoonga. Analyses for 23 elements were conducted on 50 kidneys and 53 livers; special focus was on cadmium (Cd) and mercury (Hg). Mean Cd was 27.6 parts per million (ppm) dry-weight (range 1.0-86.7 ppm) in liver and 166.5 ppm dry-weight (range 3.6-457.6 ppm) in kidney. Mean Hg concentrations were 1.1 ppm dry-weight (range 0.3-7.6 ppm) in kidney and 4.2 ppm dry-weight (range 0.3-37.0 ppm) in liver. Mean Cd concentrations exceeded levels (13 ppm dry-weight) thought by the Environmental Protection Agency to interfere with organ function in some animals. While the mean Hg concentration in the liver did not exceed the Food and Drug Administration standard (5 ppm dry-weight) set for human consumption, many individual values were obtained

that far exceeded this level. It is uncertain what these results may mean to the health of walrus or to the human population that consumes walrus tissue as part of a traditional subsistence lifestyle. Additional monitoring studies are planned through activities outlined under the U.S.-USSR Cooperative Agreement and the Service's Harvest Monitoring Program.

Marking, Tagging and Reporting Program

The Service established a Marking, Tagging and Reporting Program (MTRP) in October 1988 to monitor the subsistence and handicraft harvest of polar bear, sea otter and walrus by coastal Alaskan Natives. Since that time, the MTRP collects biological data needed to manage these species and assists in controlling the illegal take, trade and transport of specified raw marine mammal parts.

As often as practical, local Native village residents are hired and trained to tag hides, skulls and ivory and to record information pertaining to the harvest of marine mammals. The MTRP has 95 designated taggers and 44 alternates in 81 villages throughout coastal Alaska [Table 7]. Of these 95 designated taggers, 76 are Alaskan Natives, three are non-Natives living in villages, and the remaining 16 are Service employees. Tagging kits are provided by the Service, and on site training and village meetings are conducted by the Service's MTRP Coordinator. The taggers apply color coded, numbered locking plastic tags to each hide and skull of the polar bears and sea otters presented for tagging. Walrus ivory is removed from the noseplate, and a lead headed wire tag is attached through a small hole drilled in the root area. An ultra-violet reflecting light marker is also applied to the anterior and posterior surface of each tusk. Natives have 30 days from the date of kill or acquisition to present specified marine mammal parts for marking, tagging and reporting purposes.

Harvest reporting forms are used to collect information regarding species, measurements of skulls and tusks, sex, age class, location and date of kill or find. In the case of walrus ivory, the condition of the take including shot and retrieved, floating dead, or beach found are indicated. Each polar bear and sea otter harvested has a tooth removed and examined for ageing purposes.

Harvest data was collected from 47 villages in 1991. Several villages collect harvest information on both walrus and polar bear, and information on both sea otter and walrus is collected at a few locations.

Sea otter hunters presented 159 otters to 7 village taggers in 1991 [Table 8]. Continued low harvest numbers in 1991 were due to the Interim Rule (discussed above in more detail in the *Sea Otter-Alaska* section) published on April 20, 1990, that precluded sale of handicrafts or clothing to non-Natives. The District Court's July 16, 1991, ruling overturned the Service's Interim Rule. The harvest increased substantially during November and December.

During 1991, 33 walrus taggers reported 2,048 walrus being tagged [Table 9]. The success of walrus hunters varies by location and is affected by weather and ice conditions. Many village hunters reported good numbers of walrus, however some hunters had difficulty in reaching the walrus. Although we cannot verify the actual level of compliance, compliance with the regulation varies depending on the attitude of the individual hunters and persistence of the taggers. Taggers for most villages report improvements each year. However, several villages have been identified that need further encouragement to ensure compliance.

Table 7. Villages with Service Taggers and Species Tagged.*

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

* 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, Marine Mammals Management, Marking, Tagging and Reporting Program, 4230 University Drive, Suite 310, Anchorage, Alaska, 99508.

A total of 74 polar bears was reported harvested by 12 taggers during the 1990/91 season [Table 10]. Polar bear harvest figures are reported by harvest year (July 1 to June 30), rather than by calendar year.

The Service will continue to make frequent village visits and work with Native leaders, contract taggers, and local residents and hunters in an attempt to keep them informed of MTRP requirements and

the need for reliable information. A quarterly newsletter provides feedback to local taggers and others and answers commonly asked questions. These newsletters are often posted at community centers for all village residents to read.

A summary of the three species of marine mammals marked and tagged since the inception of the MTRP Program in Alaska is presented in Table 11.

Table 8. Sex and Age Class of Sea Otters Tagged through the Marking, Tagging, and Reporting Program as of December 31, 1991.

Sex	Pre-rule ^a	1988 ^b	1989	1990	1991 ^c	Total
Male	229	43	195	130	109	706
Female	94	9	39	23	21	186
Unknown	160	0	49	7	29	245
Totals	483	52	283	160	159	1,137
Age Class	Pre-rule ^a	1988 ^b	1989	1990	1991 ^c	Total
Adults	435	51	244	128	149	1,007
Subadults	25	1	22	24	6	78
Pups	7	0	2	3	2	14
Unknown	16	0	15	5	2	38
Totals	483	52	283	160	159	1,137

^a Animals harvested before October 26, 1988.

^b Animals harvested between October 26, 1988, and December 31, 1988.

^c Data may be incomplete.

Table 9. Sex and Age Class of Walrus Tagged through the Marking, Tagging, and Reporting Program as of December 31, 1991.

Sex	Pre-rule ^a	1988 ^b	1989	1990	1991 ^c	Total
Male	544	7	348	480	916	2,295
Female	221	0	215	465	933	1,834
Unknown	671	0	166	398	199	143
Totals	1,436	7	729	1,343	2,048	5,563
Age Class	Pre-rule ^a	1988 ^b	1989	1990	1991 ^c	Total
Adults	895	5	624	960	1,735	4,219
Subadults	110	1	61	40	58	270
Calves	25	0	11	341	253	630
Unknown	406	1	33	2	2	444
Totals	1,436	7	729	1,343	2,048	5,563

^a Animals harvested before October 26, 1988.

^b Animals harvested between October 26, 1988, and December 31, 1988.

^c Data may be incomplete.

Table 10. Sex of Polar Bears Tagged through the Marking, Tagging and Reporting Program as of December 31, 1991.

Sex	1987/88	1988/89	1989/90	1990/91 ^a	Total
Male	71	84	67	50	272
Female	48	33	22	12	115
Unknown	3	13	11	12	39
Totals	122	130	100	74	426

^a Data may be incomplete. Includes 10 bears known harvested but not yet tagged.

Table 11. Summary of Animals Tagged by the MTRP through December 31, 1991.

Species	Pre-Rule	1988	1989	1990	1991	Total
Walrus	1,436	7	729	1,343	2,048	5,563
Sea Otter	483	52	283	160	159	1,137
Species	1987/88	1988/89	1989/90	1990/91	Total	
Polar Bear	122	130	100	74	426	

Incidental Small Takes

Section 101(a)(5) of the Act gave the Secretary authority to allow, on request by a U.S. citizen engaged in a specified activity (other than commercial fishing) in a specified geographical region, the incidental, but not intentional, taking of small numbers of marine mammals. Permission may be granted for a period of five years or less.

On March 30, 1990, the Service received a request from Shell Western E & P Inc. (SWEPI), seeking promulgation of regulations to allow the incidental take of small numbers of polar bears and Pacific walrus during oil and gas exploration activities in Alaska State waters and on the Outer Continental Shelf adjacent to the coast of Alaska during the open water season in the Chukchi Sea for a period of five years.

On June 14, 1991, the Service published a final rule in the *Federal Register* (56 FR 27443) to allow for the next 5 years the incidental, but not intentional, take of small numbers of walrus and polar bears during open water exploration for oil and gas in the Chukchi Sea.

Letters of Authorization (LOA) were issued to SWEPI and to Chevron, U.S.A. Inc., for the incidental taking of walrus and polar bears associated with oil and gas exploration activities in the

Chukchi Sea. The LOAs were valid through December 31, 1991, and conditioned to include a Monitoring Plan and a Cooperation Plan. The Monitoring Plan was designed to monitor the interaction between exploration activities and the walrus and polar bears. The Cooperation Plan was required to mandate interaction between industry and the local Native communities in order to minimize any adverse effects on the availability of walrus and polar bears for subsistence uses.

On December 17, 1991, BP Exploration, (Alaska) Inc., for itself and on behalf of 14 other petitioners submitted three separate petitions for the promulgation of regulations that would allow the incidental taking of polar bears and walrus in connection with oil and gas operation in the Beaufort Sea region. Operations include: (1) exploration operations during the ice-covered period; (2) exploration operations during the open-water season; and (3) year-round development and production operations.

Service representatives participated in the NMFS hosted incidental (small) take workshop during February 25-27, 1991, in Seattle, Washington. Workshop participants evaluated the possibility of standardizing monitoring requirements for whales and pinnipeds covered under LOAs.

Sea Otter-Southern

The southern sea otter 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 (British Columbia), central California, and the San Benito Islands (Baja California). 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 (CDFG) and the Service again conducted a spring and fall survey in 1991. 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 numbers of otters counted during the spring 1991 survey was higher than any since these counts were first begun [Table 12]. As a rule, fall counts are consistently lower than spring counts. This may, in part, be due to the fact that sea otters are more difficult to observe in the



A sea otter floating in kelp. U.S. Fish and Wildlife Service photo.

fall owing to their increased dispersal throughout the range, and, in part, to the greater abundance of bull kelp during the fall, which obscures some 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 still found between Monterey and Morro Bay.

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 are twofold: (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 nearshore community. The latter information is particularly important in attempting to understand the characteristics and impacts of a sea otter population at its optimum sustainable 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 to 19 nautical miles from the 15-fathom contour surrounding SNI. 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. In line with this information, translocation strategy changed. These changes were discussed in the Service's 1988 Annual Marine Mammal 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 CDFG 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 to 1990) 139 sea otters were translocated to SNI. No otters were captured for translocation in 1991. Near the end of the fourth year of translocation (June 1991) and through December 1991, about 13 sea otters were observed at SNI. The number of otters observed at SNI (13 to 15 not including dependent pups) has been stable since November 1989. Furthermore, reproduction at the SNI is continuing and as of 1990, at least five pups are believed to have been successfully weaned into the population. 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 in January 1992, at least 9 of the 13 otters observed at SNI are animals that were translocated to the SNI. The cause(s) of the continuing attrition remains unknown, although dispersal and incidental mortality in fishing gear are suspected as the primary factors.

Status of Colony

One hundred thirty-nine sea otters (31 males, 108 females) were translocated to SNI during the period August 24, 1987, to June 30, 1990. As of December 31, 1991, the disposition of 49 sea otters that are no longer at SNI is known or suspected. Thirty-three sea otters left the SNI and returned to the parent population. Five were caught in the "no otter" Management Zone in southern California 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 were found dead on beaches in southern California (one of these had been shot and the other causes of death were undetermined). Three sea otters are suspected of having died in fishing gear.

Table 12. 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

^a In 1991, all survey data since fall 1982 was reviewed and counts corrected.

^b California Department of Fish and Game aerial survey with ground truth stations.

^c Experimental.

Two groups of translocated otters have been found away from SNI, one at San Miguel Island (SMI) and one at Point Purisima. In both groups dependent pups were observed. Because SMI is within the "no otter" Management 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 will likely be eliminated. However, if both groups become established, a significant step toward recovery would be achieved.

Summary of Mortality and Natality

During the calendar year covered by this report, there was one sea otter mortality reported within the Management Zone. This otter, found at SMI, was positively identified as an animal that had been translocated to SNI. Cause of death could not be determined.

A total of 17 pups are known to have been born at the SNI. During this calendar year, three pups were observed at SNI. To date, at least five pups are believed to have been successfully weaned.

Containment

The containment program is designed to prevent sea otters from colonizing the Management Zone through a cooperative effort between the Service and the CDFG. 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 were captured in the Management Zone in 1991. One of these otters had been captured and transported out of the Management Zone the previous year. Captures were the result of cooperative efforts between the Service and the CDFG. All captures this year were made by divers trained in re-breather apparatus using Wilson traps attached to underwater vehicles.

Service and CDFG biologists recognized that the Cojo Anchorage area was likely to attract otters that wandered down from the mainland range. This year survey/capture trips were made to the area without recent reports of otters from the public. Two sea otters were located and captured this year using this approach.

Elsewhere in the Management Zone, a group of up to 10 sea otters has been observed in the Point Bennett area at SMI since March of 1991. Two sea otters were captured at SMI this year. Capture efforts directed at the remaining otters will continue. Point Bennett is known for turbulent sea and volatile weather conditions, making this area, perhaps, one of the most difficult within the Management Zone to capture sea otters. Single day trips do not appear practical; most of the capture trips have been scheduled as a week long effort aboard a chartered vessel.

To date, a total of 10 adult sea otters and 1 pup have been captured in the Management Zone. One of these otters (Service No. 305) was captured twice in the Management Zone. Four of the adults were females and six were males. Five of the adults had been translocated to SNI, four had apparently swam down from the mainland range, and one was of unknown origin. The pup was captured with its mother and was apparently born in the Management Zone. All of the otters known to have come down from the mainland range were old males (based on size, tooth wear, and general appearance) and were captured in the Cojo Anchorage area.

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 unlawfully take sea otters. Pursuant to Public Law 99-625 and the Federal regulations governing the sea otter translocation program, the Service has implemented a law enforcement plan for protecting the SNI colony of sea otters.

From 1987 to 1989, the Service employed two Wildlife Officers specifically for law enforcement and containment needs associated with the Service's Sea Otter Translocation Program. In 1989, one officer accepted a position with the NMFS and, although replaced by a biologist to help with containment activities, no replacement officer has been added to the Program.

As in 1990, law enforcement activities associated with the translocation of sea otters were greatly reduced this year and tended to focus on peak boat use periods at SNI. Activities included the monitoring of boats from the shore of SNI and responding to reports of dead otters in the Management Zone. High visibility patrols using the Service's *MV Sea Otter* were limited by availability of personnel

trained in law enforcement and in navigation, marine safety, and operation and maintenance of large boats. The use of the smaller, inflatable boat to patrol and visit vessels working the area was limited by availability of personnel trained in law enforcement. The wildlife officer assigned to the project spent the majority of his time with sea otter containment activities this year.

Commercial and recreational boat activity at SNI followed the same general trends observed during the first three years of the translocation program. Boat activity peaked in early October when lobster season opened and sea urchin prices began to rise. This activity tapered off gradually and was influenced greatly by weather conditions. Military operations at SNI appear to have had little effect on the number of boats coming to SNI for commercial or recreational purposes. However, operational needs did force boats occasionally to move away from specified sections of SNI.

There were no reports of illegal activities involving sea otters at SNI this year. Considering past patterns of boat activity, the small number of otters residing at SNI, and the constant monitoring of those otters by biologists stationed at SNI, there is little likelihood that overt illegal activities went unreported.

Unintentional disturbance of sea otters by vessel traffic was noted by research personnel observing otters at SNI. A typical case of unintentional disturbance would involve a boat either passing or anchoring near a group of sea otters causing the otters to disperse. Generally, this displacement is temporary and the otters regroup in the same area at a later time. There is still concern that such disturbance may result in some otters dispersing from SNI. Since the beginning of the translocation, most sea otters have tended to congregate in an area of SNI where vessel traffic is light.

A number of sea otters have been reported in the 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.

In April of 1991, NMFS research personnel found a dead sea otter on SMI. The carcass was decomposed but was positively identified as one of the otters that

had been translocated to SNI. X-rays showed no evidence of a gunshot wound. The dead otter at SMI was found at the same time the Ventura Office was receiving reports of sea otters living at SMI. SMI has commercially important abalone and sea urchin beds. Tensions are running high among fishermen who see sea otters as a direct threat to their livelihood.

Open Cases—The death of a SNI sea otter, found by the U.S. Navy on shore at Point Mugu in 1987, is still under investigation. This otter was shot, and although a \$10,000 reward was posted, no information has yet been forthcoming.

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. Efforts by the Service and the CDFG to observe incidental take of sea otters were reduced this year as a result of the new State restrictions on gill net fishing. No (0) sea otters were reported killed in these nets in 1991. In summation, from June 1982 to December 31, 1991, a total of 73 otters have been observed or otherwise known to have drowned in 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, and 0 in 1991.

California Senate Bill No. 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 is expected to significantly reduce the number of incidental sea otter drownings. The NMFS and the CDFG 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 exist 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.

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 and recommendations to minimize impacts.

In 1990, the Service completed a draft biological opinion for the U.S. Coast Guard (USCG) evaluating the proposed traffic separation scheme for central California and the port access routes into San Francisco Bay and the Port of Los Angeles. This consultation is considering oil spill risk to sea otters (and other listed species) from vessels, especially oil tankers and barges. Based on comments received from the USCG, a second draft was completed in 1991. The USCG is reviewing the second draft.

Section 6

In 1991, the Service re-evaluated priorities for expenditures of ESA Section 6 (grant-in-aid) funds. Available funds were distributed to the states for the conservation of species identified as being critically endangered. No funds were provided for the southern sea otter.

Oil Spill Activities

Since the early 1980's the Service has been an active participant in a sea otter task group assembled to address oil spill contingency planning for sea otters. By Memorandum of Understanding with the CDFG, and as identified in the Sea Otter Recovery Plan, the CDFG had the lead for these activities. By 1989, little progress had been made beyond the establishment of a small temporary facility to care for oiled otters at the Pacific Gas and Electric's Diablo Canyon Nuclear Power Plant, San Luis Obispo County. At that time the Service became more active in attempting to get a contingency plan and response plan in place. The advent of the *Exxon Valdez* oil spill in Alaska's Prince William Sound in 1989 provided the first field experience in sea otter rescue efforts. This effort produced valuable information relevant to contingency and response planning and helped resolve differences of opinion regarding appropriate actions before and after an oil spill.

Alaska, Washington, Oregon, California and Canada have all actively been involved in the contingency planning process for all marine resources. 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 No. 2040 creating a new oil spill division within the CDFG. The ramifications of both Federal and State Legislation have yet to be realized or applied to the existing document. The contingency plan is expected to be completed by the summer of 1992, with the response plan completed by fall 1992. The State of California is actively pursuing the construction of a sea otter rescue and rehabilitation facility (as required by Senate Bill No. 2040).

West Indian Manatee

The Florida Manatee Recovery Plan, approved by the Service on July 24, 1989, guides the activities of the multi-agency Manatee Recovery Team. The Recovery Team, made up of representatives of the Service, Florida Department of Natural Resources (FDNR), the MMC, non-governmental organizations (e.g., Save the Manatee Club, Sierra Club), public utilities (Florida Power and Light (FPL)), and others, works to implement the many tasks at hand. Manatee recovery tasks include the following activities:

1. Research continues to gain a better understanding of the causes of manatee harassment, injury and mortality, and to minimize or eliminate these hazards wherever possible to enhance the survival of the species.

The salvage and necropsy program provides yearly information on manatee mortality. During 1991, 174 manatee carcasses were recovered and necropsied by FDNR. The cause of death was determined in an increased proportion (78 percent) of cases thanks to staff increases, improved public cooperation, decreased response time, and greater experience. The total number of watercraft-related deaths, 53, was the highest annual total ever recorded. Watercraft kill more manatees than any other known human-related cause. Perinatal deaths from natural or undetermined causes also reached a new record high with 53. Deaths from water control structures had been decreasing during the past 10 years; however, nine manatees died as a result of being crushed in locks or flood gates during 1991, equalling the previous all-time high from 1978.

Over the years, at least 18 manatees are known to have met their deaths from fishing tackle. According to FDNR data, ten drowned in shrimp and fishing nets and three died from entanglement in crab trap lines. Three died after ingesting either monofilament or trotlines (with and without hooks attached) and two of the many manatees seen with monofilament line wrapped around flippers and other body parts died from those injuries. Other human-related mortalities over the years include seven that were shot, three that were stabbed, and nine that were poached or butchered. Two had ingested other man-made materials (i.e., electrical cord, plastic bags).

To reduce the number of deaths and injuries to manatees from watercraft, FDNR 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. So far, only Citrus County has gained final acceptance of its plan. The Citrus County Plan was incorporated into their Growth Management plan in 1991.

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 MPPs is the development of county site-specific speed zones. Based on tracking data from the Service's Sirenia Project, abundant local knowledge, and interagency teamwork, speed zone plans, like MPPs, 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 1991, site-specific speed zones were completed in eight of the 13 coastal counties, and regulatory signing was completed in four of them. Speed zones are also being implemented near winter warm-water refuges in south-east Georgia.

A citizen's group in Volusia County, Florida, challenged their county's speed zones after its acceptance by the Governor and Cabinet. Although the challenge was rejected, the Service's Manatee Coordinator prepared an "Intent to Prepare Rule to Protect Manatees in Lake Woodruff National Wildlife Refuge" in the event of further disputes. This will allow the Service to invoke its own regulations on refuge-related waters should the State rule fail.

Within National Wildlife Refuges (NWR), areas presenting the greatest threat to manatees are posted and maintained. Seasonal posting of manatee sanctuaries at Crystal River NWR was expanded in 1991 to include four new sanctuaries in Kings Bay. The Emergency Rule creating the new sanctuaries went into effect just in time for the November 15 start of the official manatee season. Chassahowitzka NWR also posted a 2-mile slow speed zone along the Chassahowitzka River for manatee protection.

In March 1990, Merritt Island NWR established a 15 square mile year-round manatee protection area on the Refuge making this essential area off-limits to motorized vessels of all kinds. Surveys show manatees have increased their use of the area since power boats have been excluded.

Research continues on other ways to prevent water vessel collisions with manatees. Following the deaths of several manatees at Kings Bay Naval Submarine Base in southern Georgia, the Service's Manatee Coordinator and the Service's Sirenia Project recommended several actions for the base, including equipping their Trident submarine tugs with propeller guards, a project to be completed early in 1992.

Agencies are working together to eliminate water control structure and lock-related manatee deaths. The Service, FDNR, and representatives of the water management districts and the Army Corps of Engineers (COE) discussed several possible solutions including redesigning structure doors, using sonar to detect a manatee's presence, sound as a warning device, 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.

Stricter laws and public education will reduce deaths associated with fishing tackle. Thanks to a State proposed rule, the intentional discarding of monofilament lines, nets, and other debris will soon be unlawful. In Duval County, an informational brochure for shrimp fishermen is being developed to teach shrimpers how to remove manatees from their nets.

Recovery activities include the rescue and rehabilitation of injured or diseased manatees and transfers of captive animals. FDNR's new rescue coordinator handles the initial phases of a rescue event, with the collaboration of the Service. Selected teams "verify" the presence of an injured animal, then rescue teams capture and transport the manatee to a rehabilitation center, if necessary. In 1991, three

additional verification teams and one additional rehabilitation facility were authorized.

FDNR's Florida Marine Research Institute (FMRI) staff trained many officers of the Florida Marine Patrol (FMP) on the correct procedures for handling reports of injured or dead manatees. Similar training at the FMP Academy may be available in the future. All manatee distress calls will now be handled through the 1-800-DIAL-FMP telephone number.

Activities in manatee areas are closely regulated by the permitting processes. The Service, under Section 7 of the ESA, as amended, and the Fish and Wildlife Coordination Act, reviews all projects located in manatee habitat that have any Federal agency involvement. In 1991, the Jacksonville and Vero Beach Field Offices consulted on numerous COE permit applications, USCG permits for high-speed marine events, and a number of other projects with potential impacts on manatees. Since 1982, the Service has written 63 jeopardy Biological Opinions (55 since 1987) for manatees, more than for all other endangered or threatened species combined. None of those permits was issued. As MPPs in each coastal county are completed, the permitting process will be streamlined.

Measures to reduce the potential of impacts to manatees from high-speed marine events have been implemented. High-speed marine events in manatee habitat create a risk of harassment, injury or death to manatees that may be in the vicinity of the event. During 1991, the Service and FDNR developed guidelines for site- and season-specific zones for holding these events. The Service and FDNR also prepared draft Manatee Protection measures for permitting these events which the USCG will make a condition of their permits. Among other features, the protection measures include a rigorous "Manatee Watch" program.

Regular meetings are held to review captivity and rehabilitation issues. On September 26, 1991, the final criteria for the release of rehabilitated manatees was submitted for review. The final decision for release rests with the Service's Manatee Coordinator and whenever possible, animals will be fitted with radio transmitters to help researchers evaluate the success of rehabilitation.

The Service drafted new policy on captive breeding and worked with oceanaria to ensure compliance with the Service's permit authority.

Selective decriminalization of certain manatee speed zone violations is in progress. Currently, FMP fines for violating manatee speed zones vary

from district to district, from \$50 in some areas to \$200 in others. Officers hesitate to issue high fines for minor infractions, yet need higher fines when circumstances warrant. A bill to decriminalize manatee zone infractions to encourage officers to write such tickets is due to be presented to the Florida Legislature early in 1992. It will permit issuance of a citation for a non-criminal infraction where intent is not clear.

Efforts to expand manatee recovery activities worldwide continue. A meeting on October 7, 1991, with Recovery Team members and others with the Wider Caribbean Coalition for the Environment discussed ways of encouraging the development of recovery plans in other countries.

The MMC provided partial support (\$1,200) for the publication of *Sirennews*, an international newsletter regarding research and management developments related to manatees and dugongs.

Researchers at the Service's Sirenia Project hosted visitors from around the world, including Ivory Coast, West Africa, Netherlands, Indonesia and Guatemala. They also reviewed a manatee reserve proposal in Belize and undertook a dugong survey in the U.S. Trust Territory of Palau, Western Caroline Islands, in August 1991.

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

Manatee habitat requirements are identified through the use of state-of-the-art tracking technology. A telemetry study in Tampa Bay began in 1991 and, by year's end, 13 manatees had been tagged. Data will be entered into the Marine Resources Geographical Information System. The Sirenia Project's ongoing east coast telemetry project continues with ground and aerial tracking of tagged animals. Additional funding has allowed more animals to be tagged and use of satellite telemetry to be expanded. Effort centers on Brevard County, a migratory hub and location of many manatee deaths each year.

Since June 1988, thirteen manatees have been tracked following their release from captivity after rehabilitation. Although one was trapped in a storm sewer and died, all others have survived. Seven are known to have survived the critical overwintering period either by migrating long distances or by refuging at power plants.

Sirenia Project provided Geographic Information System (GIS) data on over 52,000 manatee locations to FDNR to use for developing MPPs. Data

are complete through 1990 and will be made current early in 1992.

Manatee food preferences, dietary requirements and nutritional requirements are being determined through several research projects.

Stomach content analysis of 33 manatees from eastern Florida (including over 100 from seagrass habitats in Brevard County) and 40 from Lee County were identified. Once the analysis of stomach contents of St. Johns River manatees is completed in 1992, all food habits studies will be summarized for publication.

The Sirenia Project continued to study the impact of manatee grazing in seagrass habitats in Hobe Sound and extended the project to include enclosure experiments in the Banana River in Brevard County. The nutritional value of different aquatic plant species is being studied as well.

The Service, FDNR and Citrus County representatives participated in an interagency working group to develop and monitor a Summer/Winter Aquatic Plant Management Plan for the Crystal and Homosassa Rivers.

To protect and monitor important manatee habitat, the number of refuges and management areas needs 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. This year, the office focused on Crystal River and Lake Woodruff NWRs.

Four additional manatee sanctuaries, totaling 32 acres, were added in Kings Bay, Crystal River, Florida, bringing the total to seven. The emergency action, taken under the authority of the ESA, as amended, went into effect on November 15, 1991, after which all waterborne activities were prohibited within the sanctuaries for 120 days. The number of sanctuaries was increased from three to seven to accommodate the growing number of manatees using the area each winter, and to offset the harassment from additional public use. Implementation of permanent sanctuaries will take place in 1992.

The Service continued to acquire habitat important to manatees and add them to the NWR System. Recent acquisitions include the islands in Kings Bay (designated as the Crystal River NWR) and the Lower Suwanee NWR.

The acquisition of an important travel and feeding area for manatees along the lower Homosassa River will hopefully be completed in 1992 and added to the Chassahowitzka NWR.

The Service is proposing to add State submerged lands in the Sebastian Creek area to the Pelican Island NWR. The area is an important manatee resting and freshwater site along the east coast manatee migration corridor.

The Service also supports the State of Florida 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. Florida's 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 FDNR worked with utility companies to coordinate plant shutdown schedules in order to cause minimal impact to manatees. Working with Gilman Paper Company in Georgia, a contingency plan was developed to ensure that sufficient warm water effluent over 18°C is being released in a management area near their paper mill to protect manatees from cold.

FPL now formally monitors the intake canal at the Port Everglades Plant in Ft. Lauderdale, Florida, for manatees and reduces the flow if manatees enter. During 1991, 16 animals entered and left the canal. In 1990, six animals had to be removed because they would not (or could not) leave, as many had done in previous years.

Informal discussions with representatives of FPL's Cape Canaveral Plant were held to consider ways to improve the value of the thermal effluent. During the 1989 Christmas "freeze," the discharge from the plant, even with all units going, was below the thermal tolerance of the animals.

During repairs of the offshore water intake structures of FPL's St. Lucie Plant in 1991, two manatees were entrapped in the intake canal. They eventually required capture and were transported to rehabilitation facilities for observation, treatment and subsequent release. Repairs to the plant were completed in December 1991 and no further manatee entrapment is expected.

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

The Service supports the efforts of Save the Manatee Club, aided by boat manufacturers and dealers, marinas and other groups including local Marine Industry Associations (MIA), who have

been actively erecting educational signs at key public access points explaining the harm of 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.

Save the Manatee Club 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. 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 educators' guides came from FPL and the MMC. Save the Manatee Club also encourages manatee educational materials be included in boating safety courses and produces public service announcements.

In 1991, FPL sponsored 13 manatee awareness workshops throughout the State which were attended by 1,180 people. Workshops were announced through newspaper advertisements, in the Save the Manatee Club newsletter (reaching over 20,000 members), and in an FPL "bill stuffer" that went to 3.1 million customers.

This year, FPL let the "Boater's Guide to Manatees" go out of print. With the continuous adoption of county speed zones, the effort to keep these booklets up-to-date was just too much. As a substitute for the Boater's Guide, FPL and FDNR have arranged for Teal and Morrell to have manatee speed zones included in their Boating Map Series. Teal and Morrell maps are updated annually and are well known for their excellent quality and detail. The company distributes over one million maps each year.

Crystal River NWR, where swimming with manatees is popular, consistently coordinates the printing of a handout for boaters and divers in Kings Bay. Distributed free of charge 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", which educate the public on how to best interrelate with manatees. Moving the headquarters of the Chassahowitzka NWR complex to Crystal River in July 1991 enhanced manatee enforcement and education efforts in Citrus County and Crystal River NWR.

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

Two state-wide synoptic aerial surveys of manatee wintering habitat in Florida and southeast Georgia were conducted in January and February 1991. These surveys utilized 33 biologists from 19 State, Federal and private cooperating agencies. A record count of 1,465 manatees was made on the second flight. Since this survey represented the most comprehensive attempt ever to cover all of Florida's known manatee habitat, it was not surprising that the number counted was higher than previous attempts. These data should not be interpreted as indicating a population increase since the methods used were different from previous studies. However, the minimum estimate of nearly 1,500 manatees in Florida is encouraging. One distressing aspect of these data and other long-term surveys is the possible decrease in the percentage of calves within the population. Plans were made for two additional synoptic surveys to be conducted in January and February 1992. (Note: The 1992 state-wide synoptic survey, conducted on January 17-18, 1992 counted 1,856 manatees. Specifics of this survey will be addressed in the 1992 report.)

Individual manatees can be identified by the scars on their hides and the mutilations on their tails and flippers. More than 800 animals now have been catalogued in this way, making it possible to reidentify manatees year after year and monitor their reproductive status. Partially funded by FPL and Florida Audubon Society, the Service's Sirenian Project has now computerized the catalogue data base which simplifies scar pattern matches.

Age determination techniques are being developed. Using growth-layer groups in bone, a researcher doing doctoral degree studies has successfully assigned ages to approximately 500 manatees from the carcass salvage program. This effort has been guided by individuals from the Service's Sirenian Project and the University of Florida.

Researchers are investigating the suitability of using Passive Integrated Transponders (PIT) tags as a permanent identification marker. FMRI successfully inserted PIT tags into five captive manatees between February 5 and August 26, 1991. Four captives continue to be monitored and one animal was released. All the tags are functioning properly, no tag migration in the animals' tissues has been detected, and the manatees have shown no ill effects. Since the captive tests have been successful, plans are underway to obtain a research permit to insert PIT tags into rescued and rehabilitated mana-

tees prior to their release and also into wild animals that are caught during other research activities, such as radiotagging. This research will provide additional life history and survivorship information.

The Sirenia Project and Jacksonville Field Office staff assisted in the coordination of the manatee working group of the national Workshop on Rehabilitation and Reintroduction of Marine Mammals. Sponsored by the MMC and the NMFS, the workshop was held in Chicago the first week of December 4-5, 1991. In preparation for this workshop, the Sirenia Lab summarized all records on manatee rescues and reintroductions, as well as on the fate of released rehabilitated manatees as determined by follow-up radiotelemetry. Jacksonville Field Office staff led sub-group discussions on management issues and regulations, and participated in discussions of medical, social/ethical, and practical considerations affecting manatee rehabilitation and release programs.

A manatee population biology workshop to be held in February 1992 will be cooperatively sponsored by FDNR and the Service. This workshop will serve to gather nationally and internationally recognized population biologists, statisticians and modeling experts to review the body of manatee data in an attempt to develop an accurate population model for this species.

The Manatee Recovery Team is dedicated to refining the methods used to monitor the status of manatee populations. The development and evaluation of aerial survey methods for estimating or indexing manatee abundance in survey/management areas, and (ultimately) Statewide continues. Radio-tagged manatees are used to estimate the visibility bias during winter aerial surveys. Aerial counts at powerplants by airplanes and by airships are being compared for accuracy. Sight-resight techniques used by biologists in Palau with dugongs are being investigated for applicability to manatees. The Sirenia Project is evaluating the use of a new method for estimating survival based on photoidentification as a mark/recapture technique.

Research continues on various aspects of manatee life history and ecology. Using the scar catalogue data base and its photographs, the Sirenia Project is extracting data on basic parameters such as size, age/sex struc-

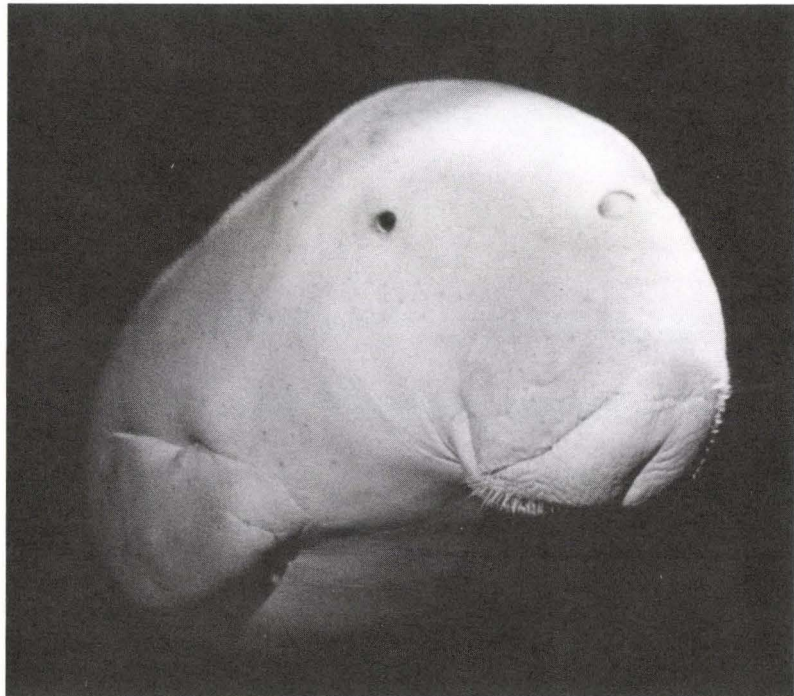
ture, age-specific survival and reproductive rates for Crystal River and Blue Spring manatees.

The 1991 Annual Report of the Florida Manatee Recovery Plan is available from the Manatee Coordinator, Jacksonville Field Office, U.S. Fish and Wildlife Service, 3100 University N, Jacksonville, Florida 32216.

Dugong

The dugong, or sea cow, is found in tropical and subtropical coastal waters of the Indo-Pacific, from Africa east to the Solomon Islands and from India south to northern Australia. The population that occurs in Palau, Western Caroline Islands, is unique because it is one of the last that occurs around an isolated archipelago or island-group, and it is the only population under U.S. jurisdiction. Service research biologists assessed the status of dugongs in Palau in 1977/78 and 1983 using aerial censuses and interviews of local residents. The population was estimated to be at least 40 animals, but not likely to exceed 150.

During August 1991, biologists from the Service and the University of Northern Queensland, Australia, in cooperation with The Nature Conservancy, completed aerial and interview surveys of the archipelago. The distribution of dugongs was similar to that seen during previous surveys, but the



A captive dugong at the Jaya Ancol Aquarium, Jakarta, Indonesia. U.S. Fish and Wildlife Service photo by GALEN RATHBUN.

scientists were disappointed at sighting only 26 dugongs during the aerial census. Although this is within the range of the numbers counted on previous surveys, because of the great experience of the observers participating in the 1991 census compared to previous surveys, more sightings were expected.

As a result of the interviews with knowledgeable residents and dugong hunters throughout the archipelago, the scientists found that the deliberate poaching of dugongs for sport and meat still regularly occurs.

The research biologists conclude that the dugong population around Palau has probably declined and continued exploitation is unsustainable. Unless the poaching is stopped as a matter of urgency, the dugong will become extinct in Palau as it has in many other isolated archipelagos.

Hawaiian Monk Seal

Service personnel from the Hawaiian Islands NWR cooperate regularly with NMFS personnel on various research and recovery actions recommended in the Hawaiian Monk Seal Recovery Plan. Hawaiian Islands NWR staff provide a variety of support services, including transportation of equipment and supplies aboard Service-funded charters, radio monitoring and message relays and maintenance of the Tern Island Field Station. As part of production and population surveys, Service biologists worked with NMFS researchers on refuge islands, tagging weaned pups and resighting tagged seals. They also conducted regular population censuses of monk seals at French Frigate Shoals and Midway Atoll, and intermittent surveys of other refuge islands. These activities are funded through normal refuge operations budget; no specific monk seal funding is received for the purpose of carrying out these activities.

Monk seal censuses conducted by refuge staff at Tern Island detected increases in the number of injured seals and the amount of discarded fishing gear. This finding, along with observations of monk seals with embedded fishing hooks, led to an emergency closure of the longline fishery in the waters surrounding the Northwestern Hawaiian Islands (NWHI). Service Refuge and Fish and Wildlife Enhancement personnel were substantially involved in the enactment of a permanent closure of the longline fishery, for waters within 50 miles of the NWHI.



Hawaiian monk seals. U.S. Fish and Wildlife Service photo by MARK RAUZON.

Service staff actively patrol and remove nets and other entangling debris from refuge beaches and reefs to reduce the likelihood of seal entanglement. Monk seals occasionally become disoriented or entrapped behind the deteriorating seawall at Tern Island. Refuge staff freed entrapped seals and returned them to the population.

The Service funded the Army COE to produce a report outlining options for shore protection at Tern Island. The report (due at the end of Fiscal Year 1992, i.e., September 30, 1992) will provide options and cost estimates for shore protection that will maximize the life of the island and minimize entrapment of Hawaiian monk seals.

A cleanup of 21 underground storage tanks was effected on Tern Island, by the Army COE, during September and October. Refuge and NMFS staff monitored the project to minimize short-term effects on Hawaiian monk seals.

The refuge assisted in transporting underdeveloped female pups from French Frigate Shoals to Honolulu where they were rehabilitated for release at Kure Atoll in an effort to repopulate Kure. Refuge staff participated in an evaluation of monk seal habitat at Eastern Island, Midway, as a site for releasing rehabilitated monk seals.

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.

Service personnel attended the April 1991 MMC meeting in Bellevue, Washington, and the November 1991 MMC review of the NMFS Monk Seal Recovery Program.

Cover Photos

From top left, clockwise:

A West Indian manatee cow and her calf.

U.S. Fish and Wildlife Service photo.

Three walrus hauled out on ice.

U.S. Fish and Wildlife Service photo.

A polar bear sow waits for her cub.

U.S. Fish and Wildlife Service photo.

A sea otter eating sea urchins.

U.S. Fish and Wildlife Service photo.

