DEPARTMENT OF THE INTERIOR

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)) stated 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 this 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(12)(B) of the Act to those mammals that are members of the orders Carnivora (polar bear, sea otter, and marine otter), Pinnipedia (walrus), and Sirenia (manatees and dugong). Accordingly, published herewith is the report of the Department of the Interior for the period April 1, 1978, to March 31, 1979, on the administration of the Act with regard to those mammals.

Issued at Washington, D.C., and dated OCT 1 8 1979

Lynn A. Greenwalt

LYNN A. GREENWALT
Director

Frontispiece. Adult bull Pacific walrus equipped with radio transmitters on tusks for tracking studies, Round Island, Alaska, May 1978. Photo by James Faro, Alaska Department of Fish and Game.

ADMINISTRATION OF THE MARINE MAMMAL PROTECTION ACT OF 1972

April 1, 1978, to March 31, 1979

Report of the Department of the Interior

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Prepared by
U.S. Fish and Wildlife Service
Department of the Interior
Washington, D.C. 20240
1979

Figure 1. West Indian manatee and her suckling calf being studied by Service biologists, Crystal River, Fla., February 1978. Photo by James A. Powell, Jr., National Fish and Wildlife Laboratory.

Administration of the Marine Mammal Protection Act of 1972

April 1, 1978, to March 31, 1979

INTRODUCTION

AUTHORITY

Pursuant to the requirements of section 103(f) of the Marine Mammal Protection Act of 1972 (86 Stat. 1027; hereinafter, the "Act"), this report describes administrative actions and the status of certain species of marine mammals. The report covers the period April 1, 1978, through March 31, 1978, and is presented in three parts: administrative actions, species status reports, and appendixes.

Under section 3(12)(B) of the Act, the Department of the Interior is responsible for the following marine mammals: polar bear, sea otter, marine otter, walrus, manatees, and dugong. On July 8, 1977, the Secretary of the Interior, through the Assistant Secretary for Fish and Wildlife and Parks, redelegated authority for the functions prescribed by the Act to the Director, U.S. Fish and Wildlife Service, as prescribed in 242.1.1 of the Departmental Manual.

MARINE MAMMAL COMMISSION

Title II of the Act established a Marine Mammal Commission and a nine-member Committee of Scientific Advisors on Marine Mammals. The Act prescribes extensive consultative roles for the Commission and the Committee with the Secretaries of the Interior and Commerce. Service contact with the Commission, through its staff, is on an as-needed basis. Formal reviews of permit applications, section 110 grant proposals, and moratorium-waiver requests are accomplished through established procedures.

The Commissioners are:

Douglas G. Chapman, Chairman, Seattle, Wash. Dr. Chapman is Dean of the College of Fisheries, University of Washington, Seattle, Wash.

Richard A. Cooley, Santa Cruz, Calif. Dr. Cooley is the Academic Assistant to the Chancellor at the University of California, Santa Cruz, Calif.

Donald B. Siniff, Minneapolis, Minn. Dr. Siniff is a Professor in the Department of Ecology and Behavioral Biology, University of Minnesota, Minneapolis, Minn.

The Marine Mammal Commission is an independent body and reports to the Congress annually.

CONGRESSIONAL HEARING

The Honorable Howard W. Cannon, Chairman of the Senate Committee on Commerce, Science, and Transportation, called a hearing on May 3, 1978, on S. 2831 and on H.R. 10730 as amended. The Senate bill proposed extending the appropriation authorization of sections 110(c) (research) and 114(b) (administration) of the Marine Mammal Protection Act for fiscal years 1979 and 1980. The House bill proposed extending the authorization of sections 110(c) and 114(b) and also proposed an authorization for the previously unfunded section 109 (Federal grants to States)--all for fiscal years 1979, 1980, and 1981. Lynn A. Greenwalt, Director of the Fish and Wildlife Service, testified before the committee about the Service's marine mammal research and administrative activities and funding under the Act, and answered questions on the Service's efforts to protect manatees in Florida, its funding under the Act, and its marine mammal activities in Alaska.

PART I--ADMINISTRATIVE ACTIONS

MARINE MAMMAL PROTECTION ACT AMENDED

Because the Marine Mammal Protection Act (MMPA) appropriation authorization expired on September 30, 1978, a reauthorization for fiscal years 1979, 1980, and 1981 (FY's 79, 80, and 81) was signed into law on July 10, 1978 (Public Law 95-316, 92 Stat. 381). This amendment set the Department of the Interior authorization ceiling for MMPA section 110(c) (research) at $1.3 million, $1.5 million, and $2.1 million for FY's 79, 80, and 81, respectively; for section 114(b) (administration) at $650,000, $760,000, and $876,000 for these respective fiscal years. It also authorized for the first time funding of section 109 to provide financial assistance to States to help them develop and implement programs for protecting and managing marine mammals in their waters. The Department of the Interior was authorized a ceiling of $400,000 for each fiscal year for this purpose. The amendment also set FY 79, 80, and 81 authorization ceilings for the Department of Commerce's MMPA operations and for the Marine Mammal Commission, and it expressly prohibited the Department of Commerce and the Interior from using administrative funds for their respective grant and research activities.

GRANTS TO STATES

On October 17, 1978, the President signed into law the Service's budget appropriation for fiscal year 1979 (Public Law 95-465, 92 Stat. 1279), which added to the appropriation requested by the Service $400,000 for grants to States to help them develop and implement protection and management programs for Service jurisdiction marine mammals inhabiting their lands and waters. These grants, sanctioned under MMPA section 109(b), may not exceed 50 percent of the cost of such programs and can be awarded only to States whose laws and regulations are consistent with the purposes and policies of the Act. State programs must include planning and at least such activities as research, censusing, habitat acquisition and improvement, or law enforcement.

After establishing policies and procedures to administer the grants, in January 1979 the Service Director wrote the directors of the fish and game or natural resource agencies in Alaska, California, Florida, Puerto Rico, Oregon, and Washington, telling them about the availability of these funds, grant conditions, and application and processing procedures, and also asking that applications be submitted to him no later than June 30. At the close of the report period, Alaska was in the process of requesting $48,900 for walrus management in fiscal year 1979 (FY 79); California and Florida had indicated they would be unable to request grants in FY 79 owing to the nonavailability of matching funds; and Puerto Rico, Oregon, and Washington had expressed no interest in the grants.

SERVICE MARINE MAMMAL REGULATIONS UPDATED

On October 2, 1978, the Service published in the Federal Register its final revised regulations dealing with the adoption and enforcement of State laws and regulations (rules) relating to the protection and taking of marine mammals (subpart F of title 50, part 18, Code of Federal Regulations; 43 F.R. 45370-45374--see appendix A). These changes, proposed on April 9, 1976 (41 F.R. 15166-15171--see 1976 annual report), clarified and simplified the procedures for States to follow in requesting Service review and approval of their marine mammal rules for waiver- and nonwaiver-related purposes, as provided for in MMPA section 109(a). They also set forth procedures, standards, and criteria that the Service will use in reviewing, approving, monitoring, and superseding State rule provisions.

Sections 18.56(b) and 18.57 of these regulations were subsequently amended on January 12, 1979 (44 F.R. 2597--see appendix B). The former change extended the deadline for receiving annual reports on approved State rules and conservation programs from 60 to 120 days after the close of the reporting period, and to include the calendar year, as well as the fiscal year, as recognized reporting periods. This was done to help States meet their reporting obligations by enabling them to complete reports in a nonpeak period of research and management activities. The latter change involved a State's obligation to notify Federal authorities when a certain percentage of the maximum annual taking quota permitted under a waiver of the MMPA moratorium for a species or population stock has been reached, revising it downward from 90 to 80 percent. This was done to help the Service meet its responsibility for insuring that small-quota taking limits are not exceeded.

WAIVER OF THE MORATORIUM FOR NINE SPECIES OF MARINE MAMMALS

Alaska's 1973 request to the Secretary of the Interior to waive the moratorium and return to the State management of Alaskan populations of polar bears, sea otters, and walruses coincided with a similar request to the Secretary of Commerce for northern sea lions, harbor and spotted seals, ringed seals, bearded seals, ribbon seals, and beluga whales. The Fish and Wildlife Service (FWS) and the National Oceanic and Atmospheric Administration's (NOAA's) National Marine Fisheries Service (NMFS) cooperatively considered the requests for their respective agencies. In March 1976, they filed with the Council on Environmental Quality a jointly prepared draft environmental impact statement on the proposed action and on proposed regulations; on March 27, 1978, they filed the final statement with the Environmental Protection Agency.

During the report period, the Service published and implemented revised procedural regulations governing the review, approval, and monitoring of State laws implementing a waiver (see "Service marine mammal regulations updated").

It also thoroughly reviewed: (1) the hearing record for the nine-species (overall) waiver action, which comprised the draft impact statement, comments and responses on the statement, briefs and reply briefs of interested parties, and exhibits and testimony presented at formal public hearings in Alaska and Washington, D.C.; (2) the hearing record on the walrus waiver which was implemented in 1976, subject to review and reconsideration in the proceedings on the overall waiver (see "Walrus waiver" in this report); (3) the recommended decisions of the administrative law judges presiding at the 1975 walrus waiver hearings and the 1976 overall waiver hearings (see 1978 annual report for details on the latter); and (4) comments received on these recommended decisions. On the basis of this review, on January 11, 1979, the Service published final regulations in the Federal Register (44 F.R. 2540-2547--see appendix C) to waive the moratorium and allow, subject to certain conditions, the taking of polar bears, sea otters, and Pacific walruses in Alaska and adjacent waters. The NMFS simultaneously published comparable regulations for the species under its jurisdiction. These regulations will not be effective, however, until the Federal agencies approve revised Alaska marine mammal laws and regulations. The Service's rulemaking finalized the regulations proposed on April 9, 1976 (41 F.R. 15166-15172--see appendix E in 1976 annual report), and the new regulations will replace earlier ones adopted for the 1976 walrus waiver.

The new Service waiver regulations will allow the annual "removal from the natural habitat" of no more than 170 polar bears, a maximum of 55 from the northern stock and 115 from the western stock, and they prohibit taking bears in dens, bears less than 28 months old, and female bears accompanied by a bear less than 28 months old. ("Removed from the natural habitat" means that the animal has been killed and retrieved or has been captured for purposes other than immediate return to the natural habitat.) They will also allow the annual removal of no more than 3,000 sea otters, provided that no more than 3.5 percent of any colony may be taken and none may be taken either from colonies from which otters are moving to other areas where they are establishing new colonies, or from colonies below their "optimum sustainable populations" (OSP)--a term and concept in the MMPA which refers to the relationship between the numbers of animals and the ecosystem of which they are a part. The regulations continue the 1976 walrus waiver retrieved-take annual limit of 3,000 animals, but they modify many of the conditions under which walruses may be taken. They also require that: (1) all persons taking marine mammals must be subject to the jurisdiction of Alaska and must comply with State laws and regulations, (2) the State must authorize in writing all taking under the waiver, (3) all taking--legal, illegal, and incidental--counts against the appropriate waiver quota, (4) reasonable efforts must be made immediately to retrieve or capture killed or injured animals, (5) no marine mammals taken under a permit for scientific research and public display purposes or under the waiver, nor their parts or products, may be removed from the State of Alaska unless they are first tagged, marked, or otherwise identified

according to State requirements, (6) the State must report to the Service when 80 percent of any annual quota has been taken and must take all necessary steps to insure that the annual limit for that species or stock is not exceeded, and (7) the State must conduct a workshop to obtain and analyze data on all three species and must report the findings and data to the Service. The regulations also allow Alaska to issue permits for taking animals for scientific research and public display.

On March 19, 1979, the Alaska Department of the Fish and Game (ADF&G) sent the Service detailed comments on the new waiver regulations. Mistakenly believing that the regulations were proposed rather than final rules, and therefore subject to negotiation, the ADF&G explained in detail why it could not accept the waiver terms as published. Among the problems noted, it cited as special concerns: (1) apparent discrepancies between Service and NMFS regulations, (2) what it considered to be excessive Federal attention to individual marine mammal species and inadequate regard for their ecosystem components, (3) its total agreement with the principle of OSP but its dissatisfaction with the Service's

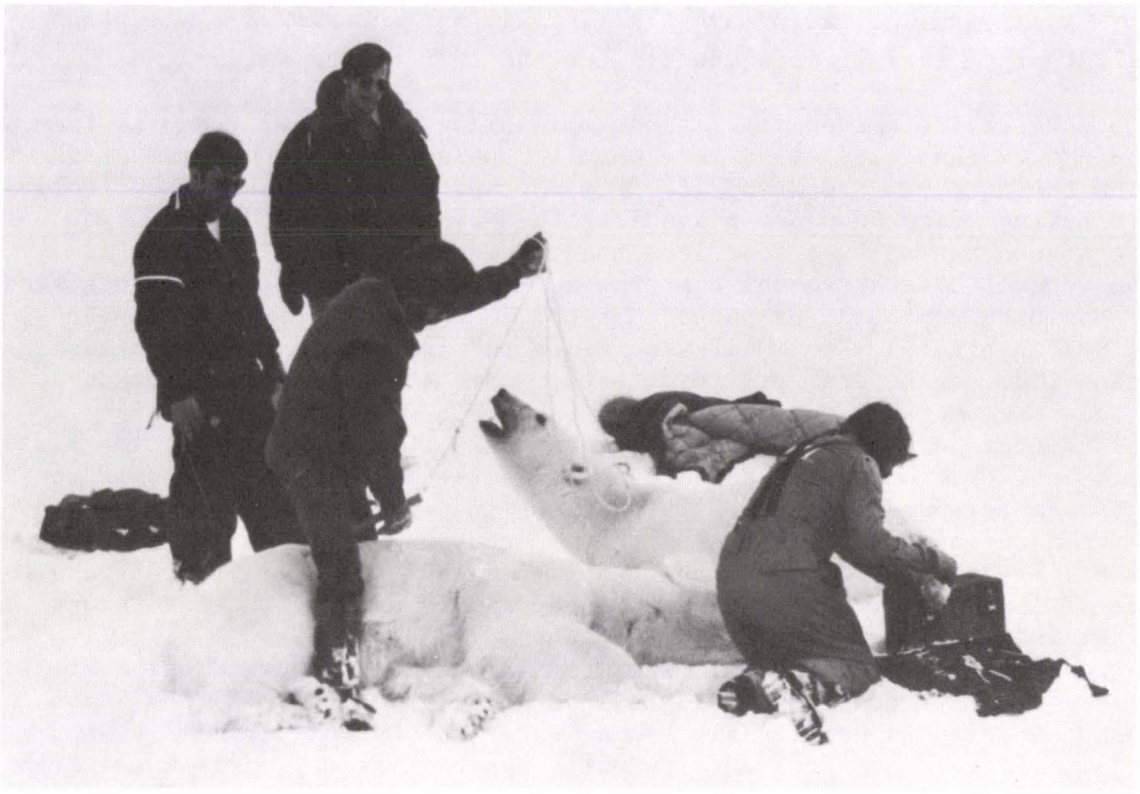

Figure 2. Service biologists prepare to attach ear tags to a male and female polar bear, offshore from Barrow, Alaska, April 1978. Photo by R. L. Brownell, Jr., National Fish and Wildlife Laboratory.

explanation of the OSP definition, (4) the inflexibility of fixed annual quotas and the desirability for average annual harvest levels that take into account the varied availability and importance of different species in different years due to variable climatic conditions, varying ice-dependent animal distribution, and other factors, and (5) its belief, based on indications of population stress, that the walrus quota is too low, that the population may be above the carrying capacity of the environment, and that continuation of the 3,000-animal quota will ultimately disadvantage the population and contribute to its imminent crash. Indicating that it would recommend returning walrus management to the Service on June 30 if these and other concerns were not satisfactorily resolved, the ADF&G requested immediate State/Federal discussion and negotiation of the waiver conditions.

At a March 30 meeting in Anchorage attended by Interior, NMFS, ADF&G, and Alaska Attorney General's Office representatives, Federal participants pointed out that the January regulations were final, not proposed, rules and the waiver numbers and some waiver conditions cannot be modified because they were based, of necessity, only on evidence and data in the formal hearing record which would not support the State's desires. Many of the State's March 19 concerns and new ones presented at the meeting can and will be accommodated without changing existing regulations, but the meeting participants recognized that others will require another formal hearing at which sufficient additional and appropriate information must be introduced to justify new or modified waiver conditions. The Service and NMFS will continue to meet and work with State representatives to resolve waiver-related problems and to complete the steps necessary to implement the overall waiver as soon as possible.

WALRUS WAIVER

As described more fully in previous annual reports, the walrus part of Alaska's 1973 waiver request was severed from the original petition in 1975, and appropriate procedures were developed to treat the walrus waiver as a separate action, although one still subject to review when the overall request is acted on. After all prescribed steps were completed and the requirements satisfied, the Service implemented the walrus waiver and returned management of the species to the State in April 1976.

On March 20, 1978, the Service received the final installment of the State's annual report on its management program for calendar year 1976. On May 5, we sent a copy of it--in addition to the one the State earlier sent directly--to the Marine Mammal Commission (MMC), requesting consultation under the then-existing provisions in the Federal rule 50 CFR 18.56(d), and soliciting the Commission's final views on whether or not the State laws and regulations continue to comply with Federal regulation requirements.

On May 1, the Alaska Department of Fish and Game submitted for Service approval proposed changes in State regulations, as required by the then-existing 50 CFR 18.56(c). These changes were intended (1) to clarify and broaden the qualifications governing the use of walruses for food and life support activities, (2) to establish a separate recreational use system that would provide stability to both subsistence and recreational users of walruses while keeping the total retrieved annual harvest below the waiver-permitted maximum of 3,000 animals, and (3) to refine existing regulations on sealing raw walrus ivory in order to better monitor and control the flow of ivory. On May 16, the Service sent the State's request to the MMC, proposing to approve the changes following consultation because they were considered to be more beneficial to the walrus population than were the regulations then in force and because they would not affect the extent of the waiver.

On August 10, the Service received the State's annual report on its management program for calendar year 1977. After reviewing it and preliminarily determining that the report was adequate, on November 2 the Service sent it to the MMC for consultation and solicited the Commission's recommendations or comments regarding the State's continued compliance with Federal waiver-related requirements.

On January 10, 1979, the Service received a consolidated response to all three requests for consultation, in which the Commission observed that its review of the annual reports and the State's proposed regulation changes had identified several "issues" involving subsistence and other taking, collection and analysis of catch statistics, enforcement, and research. Most of these issues, the MMC said without elaborating, are common to the management regime that should apply to both walruses and the eight other species involved in Alaska's 1973 waiver request--at that time pending final Federal action. Acknowledging that some issues identified in its initial comments on the State's 1976 annual report had been resolved with the State-supplied supplemental information on this report and the data in the 1977 report, the Commission stated that other issues warrant continued attention but believed that it would be inappropriate to try to resolve them for walruses alone. If the Service were to continue the walrus waiver and also approve the waiver for polar bears and sea otters, the Commission recommended that all outstanding management issues be resolved in ensuing discussions with State representatives and other interested parties. Although the MMC did not identify or detail specific issues that should be addressed, it did offer to cooperate with the Service in resolving them.

The Service's January 11, 1979, marine mammal waiver regulations for the three Alaskan species under its jurisdiction, described more fully earlier in this report and reproduced in appendix C, modified the 1976 walrus waiver. The 1979 waiver conditions will supersede the 1976 conditions after the Service approves revised State rules and the waiver is implemented. Under these modifications, the annual retrieved harvest

upper limit will remain 3,000, but Alaska will be able to manage all walrus taking, not just hunting and killing. Also, the 1979 waiver provisions on retrieval, humane and wasteful taking, and illegal and incidental taking counting against the annual harvest quota are intended to provide more effective protection for Alaskan walruses.

MARINE MAMMAL CARE AND MAINTENANCE STANDARDS

On September 19, 1978, the Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) published revised proposed "Marine Mammal Care and Maintenance Standards" in the Federal Register (43 F.R. 42200-42218). These standards, prepared under authority of the Animal Welfare Act of 1970, as amended (7 U.S.C. 2131 et seq.) and proposed originally in August 1977, were rewritten to incorporate additional information received at informal hearings and in written comments following their initial publication (see 1978 annual report). They also followed discussions on July 18-19, 1978, between the APHIS, Service, NMFS, and Marine Mammal Commission, all of which had worked together since 1975 to develop the standards.

On November 17, the Service sent comments on the September 1978 standards to the APHIS, repeating suggested changes submitted following the July discussions but not reflected in the September rulemaking, noting its concerns about some requirements for polar bear facilities and the need to heat these facilities, and requesting that these matters be considered and appropriately addressed in the final rulemaking. After the final standards are issued, the Service, NMFS, and APHIS will conclude a cooperative agreement identifying and detailing their individual and collective responsibilities for administering them.

When the standards are finalized and implemented later in 1979, they will govern the humane handling, care, treatment, and transportation of live marine mammals maintained in captivity for purposes of research, testing, experimentation, or exhibition. Specifically, they are intended to provide each individual marine mammal with at least the minimum acceptable conditions consistent with its good health and well-being and with regard to its physical requirements and behavioral characteristics.

ENDANGERED SPECIES

The West Indian and Amazonian manatees, dugong, and marine otter are also classified as endangered under the Endangered Species Act of 1973, as amended (ESA) (16 U.S.C. 1531-1543), the California population of sea otters is classified as threatened, and the West African manatee has been proposed for threatened status. The following accounts highlight some of the Service's activities involving West Indian and West

African manatees and sea otters in California during the report period. Additional information is included in the "International activities" section of this report and in status reports for individual species.

West Indian Manatee

The West Indian manatee, Trichechus manatus, is a highly endangered species that is suffering severely at the hands of humans, especially in Florida where its activities are often not compatible with human activities. Of the 263 dead animals recovered by Service and University of Miami salvage teams between 1974 and the end of 1978, the salvagers could determine the causes of death for 133. Forty-five (34%) of the deaths were attributed to natural causes. However, 88 (66%) of the animals were killed, directly or indirectly, by human activities: 51 by collisions with motorboats or barges, 20 by human structures such as automatic flood gates at salinity dams and canal lock gates, 6 by undetermined trauma, and 11 by other human causes such as ropes and fishing nets, lines, and hooks.

During the report period, the Service, State and other Federal agencies, the Florida Audubon Society, the Florida Power and Light Company, and other groups continued the intensified coordinated efforts described in the 1978 annual report to gather needed baseline data and to increase the effectiveness and scope of manatee protection in Florida through stronger legislation, regulations, law enforcement, and public information and education. The Manatee Recovery Team, officially reorganized on April 25, 1978, met in May, June, and October and completed a preliminary draft West Indian Manatee Recovery Plan which was circulated in January 1979 for internal Service review. The final plan, when approved by the FWS Director, will chart a course for recovery of the species under the Service's Endangered Species Program auspices, guiding allocation of State and Federal funds and identifying and programing proposed activities to meet critical research and management needs. A revised version of this document, termed a "technical review draft," was about to be released for formal review and comment at the end of the report period. At that time the recovery team comprised: Team Leader: John C. Oberheu (FWS, Jacksonville Area Office); Members: Dr. Robert L. Brownell, Jr. (FWS, National Fish and Wildlife Laboratory (NFWL), Washington), A. Blair Irvine (FWS, NFWL, Gainesville Field Station), Dr. Peter C. H. Pritchard (Florida Audubon Society), and Maj. Lewis W. Shelfer, Jr. (Florida Marine Patrol); Consultants: Dr. Howard W. Campbell (FWS, NFWL, Gainesville Field Station) and William H. Harper (Information Director, Florida Department of Natural Resources). In addition, the Service implemented in September 1978 the first of its annual Manatee Law Enforcement Strategy Plans to maximize cooperative State and Federal enforcement activities in Florida. This plan, although separate from the Recovery Plan, is the cornerstone of Federal enforcement efforts, and it was being revised at the close of the report period to incorporate improvements identified following its initial implementation.

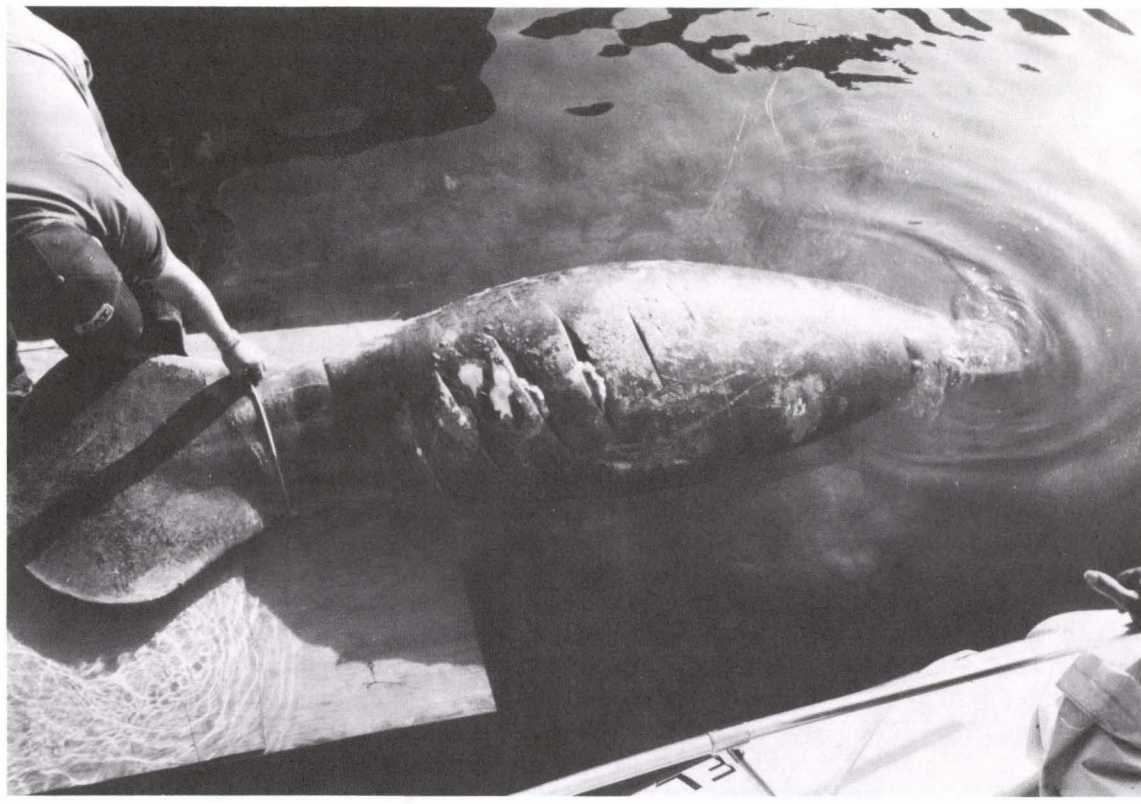

Figure 3. Salvaging a dead West Indian manatee bearing fresh, large boat propeller wounds, Crystal River, Fla., December 1974. Photo by A. Blair Irvine, National Fish and Wildlife Laboratory.

Manatees have been protected by Florida State law since 1893, but the State increased its protection capability significantly when its "Florida Manatee Sanctuary Act" (FMSA) took effect on July 1, 1978. The FMSA publicly declared the entire State to be a refuge and sanctuary for the manatee; named this species as the "Florida state marine mammal"; required that State permits be secured, with FWS concurrence, to possess manatees for scientific research or propagational purposes; prohibited harassing, disturbing, or taking manatees by persons lacking a valid State or Federal permit at any time, by any means, and in any manner, either intentionally or negligently; set penalties for violations; required regulation of motorboat speed and operation between November 15 and the following March 31 in nine separate areas and in part of the Intracoastal Waterway; directed that similar rules be adopted for other areas should the need arise; and called for joint enforcement of the Act by the Game and Fresh Water Fish Commission (GFWFC) and the Department of Natural Resources (DNR), with the latter as lead agency. Following 6 public hearings, the State subsequently finalized rules involving primarily "idle speed" and "slow speed" zones in 13

areas where manatees congregate in winter. These rules were approved by Florida's Governor and State Cabinet in February 1979, and will be in effect in the 1979-80 winter season. Earlier, on September 26, 1978, and acting on the Service's recommendation, the State prohibited canoes as well as other boats in Blue Spring State Park from November 1 of one year through March 31 of the following year in order to eliminate the canoe-associated harassment of the winter congregation of manatees in this manatee sanctuary, designated as such by the DNR in 1973.

During fiscal year 1979, the Service will provide, through Federal grants-in-aid under the ESA, $140,800 to Florida for its manatee-related law enforcement activities. Additional funds will be provided under the MMPA, especially to help develop and distribute materials for a coordinated public information and education program.

This program, intended to increase public awareness and enlist voluntary public compliance with manatee conservation and protection measures, depends on the support and active participation of the "manatee working group"--a collection of representatives of State and Federal agencies, conservation organizations, and several private organizations and individuals. At working group meetings in July 1978 and January 1979, Service and other researchers reported on the progress and results of their studies, State and other Service representatives reported on their respective regulation and other protection measures, other State representatives described the accelerating State-led information and education efforts and results, and a Florida Audubon Society biologist described the Society's complementary efforts, which, like one of the Service's research projects, are being financed by the Florida Power and Light Company.

Among the results of the coordinated efforts to increase public awareness of the plight of the manatee in Florida, during the report period the DNR installed on heavily traveled highways near strategic manatee protection areas large billboard displays dramatizing the injuries and death that boat propellers inflict on manatees; distributed large numbers of comparable posters to marinas, sporting good stores, and other locations where the boating and general public would see them; sent numerous news releases to magazines, newspapers, and radio and television stations; distributed large numbers of educational pamphlets and "Boaters--Your props just kill me" bumper stickers to schools, scouts, other youth groups, and elsewhere; sent informational packets to the news media before the Governor's proclamation of November as "Manatee Awareness Month"; developed a traveling display for fairs and boat shows; and promoted the toll-free "manatee hotline" on which people throughout the State can report by telephone dead and injured manatees, hazards to manatees, and violations of manatee protection rules. The Service publicized manatee protection at the Titusville hydroplane races, which featured a specially developed slide series, printed T-shirts, manatee-protection signs to familiarize the public with them, pre-race

news coverage and a special radio talk, and manatee-awareness questionnaires. It also developed and issued jointly with the DNR in December a fact sheet especially for boaters and divers, warning them about Federal and State prohibitions against--and penalties for--harassing manatees, describing manatee habits and winter distribution, and listing guidelines for reducing the possibility of boat/manatee collisions. In January, three new Service-produced public service spot announcements on manatees were released to Florida television stations, and in December the Florida Audubon Society released two additional TV spot announcements and four radio public service announcements as part of its Manatee Awareness Program. The Society also produced magazine articles on manatees and conducted a series of workshops for teachers in areas where manatees concentrate at Florida Power and Light Company powerplants. The teachers, in turn, have passed the information they learned to hundreds of students and will continue to do so.

During the report period, the Service developed regulations to restrict boat speeds within the boundaries of the Merritt Island National Wildlife Refuge, which adjoins the John F. Kennedy Space Center, and to establish federally protected areas for West Indian manatees. The Merritt Island regulation, proposed in the June 28, 1978, Federal Register (43 F.R. 28017-28018--see appendix D) and finalized on October 19, 1978 (43 F.R. 48648-48649--see appendix E), was intended initially to be a prototype for subsequent regulations for other national wildlife refuges. Specifically, it restricts boat speeds between November 20, 1978, and December 31, 1979, to "minimum wake/slow speed" at two separate locations where there is a high probability of boat/manatee collisions. These are known locally as "Haulover Canal" and "Hanger AF Turnbasin and Channel," and the restricted zone in each is about 10,000 feet long. Both restricted areas will have conspicuously posted signs reading "Warning Manatee Area" "Minimum Wake/Slow Speed," but boating will otherwise be governed by applicable State and Federal regulations. "Minimum wake/slow speed" is defined in the regulation as that speed which permits good steerage but produces little or no wake. Under this definition, boats that are "planing" are not at slow speed; a boat that is not planing but is "squatting" is not making a minimum wake; and a boat that has slowed enough to level out is making "minimum wake."

On January 23, 1979, the Service proposed in the Federal Register the addition of a new subpart J to its ESA regulations in title 50, part 17, Code of Federal Regulations (44 F.R. 4745-4747--see appendix F). Regulations in this subpart would allow the establishment of manatee protection areas, termed "manatee sanctuaries" or "manatee refuges," in which specified waterborne human activities could be restricted or prohibited at specified places and during specified times of the year to protect manatees, especially in winter congregating areas, from human-caused injury or harassment. These activities would include any or all of the following: boating, fishing, swimming, snorkeling, skindiving and SCUBA diving, water skiing, and surfing. Specifically, the regulations would

enable the Service to restrict, by regulation, all waterborne activities in a "manatee sanctuary" when it determines, following formal prescribed procedures, that any activity would result in the taking of one or more manatees, including but not limited to a taking by "harassment"; "harassment" in this ESA context means "an intentional or negligent act which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering." Alternatively, the regulations would enable the Service to restrict only certain activities in a "manatee refuge" if only those activities would result in such taking. The Service would have to satisfy, however, the same formal procedural requirements for establishing both categories of protection areas. In their February comments on the proposed rulemaking, the DNR and GFWFC questioned the necessity for implementing the Federal regulations in Florida, fearing that they might create a possible "public backlash" against Federal and State manatee protection regulations in high recreational use areas. On March 23, the Service extended the closing date of the proposed rulemaking comment period to April 24, 1979 (44 F.R. 17762--see appendix G).

Between April 1, 1978, and March 31, 1979, the Service conducted 37 formal "section 7" consultations for projects that might impact the West Indian manatee and 4 others involving both manatees and the California population of sea otters. These consultations are required under section 7 of the ESA and may be requested for any Federal projects, or non-Federal projects involving Federal approval, permits, or funding, before these projects may be implemented. The results, although not binding, must be considered before action decisions are made, and they are issued by the Service's Washington and Regional Offices in the form of "biological opinions," which support the Service's determination that a proposed project (1) would promote conservation of a species, (2) is not likely to jeopardize a species, (3) is likely to jeopardize a species, or (4) is not likely to jeopardize a species if conditions stated in the opinion are adopted.

Of the 37 manatee-related consultations, 6 involved Outer Continental Shelf (OCS) oil and gas lease sales and other activities, and the Service issued the following findings in its opinions: For manatees in OCS sales 45, 58, and 51 (all in the western and central Gulf of Mexico), no jeopardy; for the programmatic consultation on Gulf-wide leasing and exploration, jeopardy for manatees due to boating activities between Cedar Key, Fla., and Key West, Fla. (One alternative that would preclude jeopardy involved using Tampa/Port Manatee as a support base for the proposed operations, and restricting associated shipping to the deeper channels between Egmont Channel and Port Manatee.); for OCS sale 65 (eastern Gulf of Mexico), not likely to jeopardize if lease holders use Tampa/Port Manatee and deeper channels to support activities and also use this area as a heliport and not a boat area (Oil spills were not considered to be a threat as probable spill sites would be too far from areas of critical

habitat.); and OCS sale 43 (South Atlantic), not likely to jeopardize, with the proviso that any subsequently proposed activity in Jacksonville Harbor and the mouth of the St. Johns River will require additional section 7 consultation.

Of the 16 manatee-related consultations conducted by the Service's Southeastern Regional Office, 4 consultations are still in progress, and 6 projects are not likely to jeopardize manatees. Four others are not likely to jeopardize manatees subject to conditions in the biological opinions (Mill Cove and Roosevelt Roads Naval Station projects--consultations requested by U.S. Army Corps of Engineers (CE), Guayanilla Sewer Treatment Plant project--consultation requested by the Environmental Protection Agency, and Railroad Abandonment project--consultation requested by the Interstate Commerce Commission). Only the Crystal River Generating Station project and the Crystal River Generating Plant Units 4 and 5 project, consultations on both of which were requested by CE, were considered likely to jeopardize manatees.

Of the 15 manatee-related formal consultations conducted by the Service's Washington Office, 5 consultations are still in progress, 8 projects will promote conservation of manatees, and 2 are not likely to jeopardize the species.

Of the four consultations involving both manatees and sea otters in California, three projects will promote conservation of the species, and one is not likely to jeopardize them.

West African Manatee

On the basis of detailed information in the Marine Mammal Commission's November 1977 petition, on May 17, 1978, the Service formally proposed listing the West African manatee (Trichechus senegalensis) as a threatened species under the ESA (43 F.R. 21338-21339-see appendix H). Listing the species would allow certain measures to go into effect that could benefit these manatees and result in their restoration. Specifically, it would provide prohibition against importation in addition to that afforded by the MMPA, and it would restrict transportation or sale in interstate or foreign commerce. It would also allow the Government to try to: (1) make the countries in which manatees are resident aware of the importance of their protection, (2) make available to scientists of other countries the results of manatee research undertaken under U.S. sponsorship in such form as will be helpful to them in developing their own research plans, (3) encourage other countries to undertake comprehensive surveys of the status and distribution of these manatees, (4) encourage other countries to establish reserves, (5) encourage reintroductions to areas once they are well established as protected habitat, and (6) encourage the acquisition of study specimens, which might not otherwise be available, for purposes of scientific

research of animals taken incidental to net fisheries. Final listing is expected in July 1979.

Sea Otters in California

As previously noted in the account on the West Indian manatee, during the report year the Service's Washington Office conducted, under section 7 of the ESA, four formal consultations that involve both these manatees and the California population of sea otters. Three of these consultations resulted in biological opinions that the projects will promote conservation of the species; the fourth opinion declared that the project is not likely to jeopardize them. Three additional Washington Office consultations involved only sea otters in California: One opinion declared that the project will promote conservation of these otters, and the other two declared that the projects are not likely to jeopardize them.

The Service's actions during the report period regarding a proposed change in the status of the California sea otters under the Convention

Figure 4. Hind flipper-tagged sea otter, participant in Service sea otter-oiling studies, Prince William Sound, Alaska, July 1976. Photo by Ancel M. Johnson, National Fish and Wildlife Laboratory.

on International Trade in Endangered Species of Wild Fauna and Flora (CITES) are noted later in this report in the section on "International activities."

During fiscal year 1979, the Service will provide, through Federal grants-in-aid under the ESA, $154,236 to the California Department of Fish and Game for continuing sea otter research: $28,040 to study sea otter mortality rates and causes, $28,040 to study the interrelationship between sea otters and their habitat, $58,425 to determine the size, distribution, and movements of California's sea otter population, and $39,731 to determine the feasibility of translocating sea otters. The translocation work is part of a cooperative effort, involving also the Service and conservation groups, which will examine and evaluate moving otters from their present range and establishing one or more reserve populations elsewhere on the Pacific coast. The successful establishment of such reserve populations would lessen the impacts of potential oil spills or other energy-development-related accidents on otters in their present, comparatively limited range.

In addition to continuing its commitment to translocation studies and its own, complementary sea otter research, noted in this report under "Research," the Service will begin work later this spring on a recovery plan for the California population.

LEGAL ACTIONS AGAINST THE DEPARTMENT OF THE INTERIOR

Residents of Togiak, Twin Hills, and Goodnews Bay, Alaska, filed a class action, Civil No. 77-0264, in the Federal District Court for the District of Columbia in 1977, charging the United States, the Secretary of the Interior, and the FWS Director with violating their rights and failing to perform statutory responsibilities relative to the walrus waiver discussed earlier in this report, and seeking declaratory relief to void the waiver regulations that attempted to waive the exemption for Alaska Natives provided in the MMPA. In previous report periods, the Department of Justice answered the complaint and filed a motion to dismiss the plaintiffs' request for relief, the plaintiffs filed a memorandum opposing the motion, and the Justice Department filed a reply memorandum. On October 23, 1978, each side presented oral arguments before Judge Harold H. Greene, who was expected to rule soon thereafter on the Federal motion to dismiss. He did so shortly after the close of the report period in an opinion and order issued on April 2, 1979, concluding in his opinion that the MMPA permits Alaska Natives to hunt non-depleted stocks of walrus in a nonwasteful manner for purposes of subsistence and creating and selling authentic native articles of handicrafts and clothing. Accordingly, he ordered that the Federal motion to dismiss be denied. A final declaratory judgement is expected later in 1979.

ENFORCEMENT

The Service's Division of Law Enforcement is responsible for enforcing the MMPA and ESA provisions for the marine mammals under Service jurisdiction. Most of the enforcement effort is based on reported or alleged Act violations, but Division of Law Enforcement special agents also apprehend Act violators and conduct initial investigations of illegal importations of marine mammals or marine mammal products. Further, they assist the NMFS by making similar apprehensions and investigations in cases involving species under that agency's jurisdiction, referring the results of these efforts to the NMFS for its consideration and appropriate action. Pursuant to a NMFS/Service memorandum of understanding, however, the Service retains jurisdiction over those investigations that involve endangered marine mammal species and initiates appropriate civil and criminal actions.

One hundred and fourteen marine mammal civil and criminal investigations were pending at the start of the report period, during which Fish and Wildlife Service special agents initiated 174 new investigations. A total of 184 investigations are closed, while 104 were pending at the end of the period.

In addition to the 24 civil penalty cases pending on April 1, 1978, the Service opened during the report period 13 new cases and closed 12, leaving 25 cases pending on March 31, 1979. Civil penalties were collected in 2 of the 12 cases closed. An $800 penalty was collected from a Canadian citizen whose two polar bear skin rugs were imported into the United States; the penalty was collected as part of a settlement that allowed the rugs to be returned to the Canadian Government for return to the man. In the other case, a $250 penalty and forfeiture of a polar bear skin were obtained in a compromise with the woman who had imported it.

The other 10 closed civil penalty cases and their dispositions are summarized as follows: In one case, a polar bear rug was forfeited by an offer of settlement; in two others, imported walrus ivory was forfeited in the same manner. In the fourth case, involving the possession of some sealskin and walrus ivory by a man in Alaska, the materials were forfeited, but no penalty action was brought because no taking or importation could be shown. Two cases involved the importation of harbor seal skin products; the seized items were forfeited after the NMFS instituted civil penalty proceedings. No action was brought in the seventh case involving the taking of a sea otter by two juveniles. The last three cases involved a single incident, the killing of a West Indian manatee which was apparently crushed by a boat during a Corps of Engineers dredging project; the Service declined action, but participating contracters were warned about the manatee problem.

SCIENTIFIC RESEARCH AND PUBLIC DISPLAY PERMITS

The Act declared a moratorium on the taking or importing of marine mammals and marine mammal products, but it included exceptions that allow scientific research on these animals as well as taking them for public display. Such research and taking, however, may be conducted only if there are no adverse effects on the health and well-being of the involved marine mammal species and populations and the marine ecosystems of which they are part.

Section 101(2)(1) of the Act and section 18.31 of title 50, Code of Federal Regulations, which govern the taking and importing of marine mammals under Fish and Wildlife Service jurisdiction, authorize the Director (by delegation) to issue permits for scientific research and public display purposes, but only after the applications have been reviewed by the Marine Mammal Commission and its Committee of Scientific Advisors on Marine Mammals.

During the report period, the Service received 11 new applications for scientific research or public display permits, 8 requests for amendments, and 1 request to reopen an application that had been previously denied; it also processed 1 additional application that was pending at the end of the last report period. Fifteen new permits or amendments were issued, 3 applications were withdrawn by the applicants, 2 were denied, and 1 request for an amendment is pending. The permits issued or amended are summarized below.

Scientific Research Permit Applications

New permit PRT 2-1609 and amendment. (University of California, LaJolla, Calif., Dr. G. L. Kooyman.) This application for a permit to conduct research on sea otters was originally denied on January 10, 1978, because of lack of information. The application file had been reopened and was pending at the beginning of the report period. The permit was issued and was later amended. As amended, the permit authorized the capture, attachment of radio transmitters and depth recorders, release, recapture and release again of 35 sea otters (Enhydra lutris) and the application of oil to the pelage of 10 sea otters as described in the application in Alaska and the coastal waters adjacent thereto. Restrictions incorporated into the authorization included: (1) the testing of instrument packages on captive sea otters before use on wild otters and reporting the results; (2) experimenting with non-oiled otters to determine usefulness of data obtained from instrument packages before putting oil on any animals; (3) termination of activities if substantial numbers of deaths or injuries occur; and (4) notification of Alaska Department of Game and Fish before beginning research. The permit was issued on June 14, 1978, and the amendment on March 17, 1979. It expires on December 31, 1979.

Amendment to permit PRT 2-3055, formerly PRT 9-2-C. (National Fish and Wildlife Laboratory, Washington, D.C., Dr. Clyde Jones, Director.) The original permit PRT 9-2-C for research on sea otters (Enhydra lutris) in California, Alaska, Oregon, and Washington was issued on December 13, 1974. Two amendments to this permit were later issued. On June 23, 1978, a request was made for an additional amendment, and it was decided to rewrite the permit, assigning it a new number in keeping with the Service's present numbering system. The new permit incorporates all changes previously approved that are still pertinent. As now written, it authorizes the following research activities during the time the permit will remain valid: may capture, mark, and release in Prince William Sound, Alaska, 95 sea otters during calendar year 1978 and 1979 and may collect not more than 10 cc. of blood from each sea otter captured. This new amendment was issued on September 12, 1978. The permit expires on December 31, 1979.

Amendment to permit PRT 2-3058, formerly PRT 9-25-C. (National Fish and Wildlife Laboratory, Washington, D.C., Dr. Clyde Jones, Director.) The original permit PRT 9-25-C for research on West Indian manatees (Trichechus manatus) was issued on September 25, 1975. Several amendments were later issued creating a series of documents difficult to follow. When two additional changes were requested, it was decided to rewrite the permit, assigning it a new number in keeping with the Service's present numbering system. The changes incorporated into the permit at this time are as follows: (1) the permittee is now the National Fish and Wildlife Laboratory, National Museum of Natural History, Washington, D.C. 20560; (2) the principal officer is now Dr. Clyde Jones, Director; and (3) a condition was added requiring that upon completion of the research any remaining parts are to be preserved and deposited in an appropriate scientific and educational institution as decided by the permittee. The new permit making these changes was issued on September 12, 1978. It expires on June 30, 1980.

New permit PRT 2-3093. (National Fish and Wildlife Laboratory, Washington, D.C., Dr. Clyde Jones, Director.) The permit authorized the marking of 10 West Indian manatees (Trichechus manatus) up to 26 times each with "Paintsticks," marking to be done as often as once a week, and the work to be done in Florida. The permit was issued on November 18, 1978, and expires on December 31, 1980.

New permit PRT 2-3106 and amendment. (National Fish and Wildlife Laboratory, Washington, D.C., Dr. Clyde Jones, Director.) The permit authorized the following activities with sea otters (Enhydra lutris) in Prince William Sound, Alaska: (1) capture, translocate, mark, and release 6 territorial males, and (2) take by netting or shooting 25 adult females for study of reproductive cycles. The permit was issued on October 4, 1978, and expires on December 31, 1979, in accordance with an amendment issued on October 24, 1978, to correct the expiration date.

New permit PRT 2-3167 and amendments. (University of Minnesota, Minneapolis, Minn., John L. Bengtson.) This permit, as amended, authorized the permittee to capture, tag with radio transmitters, weigh, measure, collect blood and urine samples, mark externally with paintstick, release and monitor movements and behavior, recapture and release again if necessary to remove and/or replace instrument packages on as many as 15 West Indian manatees (Trichechus manatus). The research is to be done in the St. Johns River drainage, Florida, including Blue Spring Run, Volusia County. The permit was issued on December 19, 1978, and expires on December 31, 1980. Amendment 1 was issued on January 12, 1979, amendment 2 on March 30, 1979, making changes to the authorization so that it now reads as stated above.

New permit PRT 2-3521. (U.S. Geological Survey, Branch of Paleontology and Stratigraphy, Menlo Park, Calif., Charles A. Repenning.) This permit authorized the import of two polar bear (Ursus maritimus) skulls from Canada for the purpose of scientific research. It was issued on March 7, 1979, and expires on February 28, 1981.

New permit PRT 2-3724. (National Fish and Wildlife Laboratory, Washington, D.C., Dr. Clyde Jones, Director.) This permit authorized the capture, marking, attachment of radio equipment, other scientific research specified in the permit application, and release of as many as 600 polar bears (Ursus maritimus) on the north and west coasts of Alaska, Beaufort and Chukchi Seas, and the high seas adjacent thereto. A maximum of 150 polar bears may be radio-collared and 15 equipped with satellite packages. This permit was issued on March 15, 1979, and expires on March 1, 1982.

Public Display Permit Applications

New permit PRT 2-2507. (Vancouver Public Aquarium, Vancouver, B.C., Canada, K. Gilbey Hewlett, Curator.) This application was initially denied on June 19, 1978, because of a lack of information, and it was reopened upon receipt of the completed application. The permit authorized the capture of four sea otters (Enhydra lutris) in Prince William Sound, Alaska. It was issued on November 6, 1978, and expires on December 31, 1979.

New permit PRT 2-3542 and amendment. (Sea World, Inc., San Diego, Calif., Dr. Lanny H. Cornell.) This permit authorized the taking of eight Pacific walrus (Odobenus rosmarus) pups in Alaska and its offshore waters for public display in Sea World facilities in California, Florida, and Ohio. The permit was issued on March 14, 1979, and expires on December 31, 1981. Amendment 1 was issued on March 30, 1979, adding a condition which required Sea World to notify the Anchorage FWS office 7 days before commencing the permitted activities and to make arrangements to have Federal personnel accompany the permittee during all taking operations.

CERTIFICATES OF REGISTRATION

Section 18.23 of title 50, Code of Federal Regulations, provides that marine mammals taken by an Indian, Aleut, or Eskimo for the purposes of creating and selling authentic native articles of handicraft and clothing may be transferred to a registered tannery, either directly by an Indian, Aleut, or Eskimo, or through a registered agent. Similarly, marine mammals taken by Alaskan Natives for subsistence may be sent to a registered tannery for processing and subsequent return to an Alaskan Native.

Any tannery or person who wishes to act as an agent may apply for registration. During the report period, the Service issued two certificates of registration that were pending at the end of the previous report period. These renewed old certificates which had expired. It also received two requests for new certificates, which were issued. There are no requests pending at the end of the report period. The new and renewed certificates are summarized below.

New certificate PRT 2-3613-RA. Still's Mat-Valley Taxidermy, Box 42, Mercy Dr., Eagle River, Alaska, Gereth B. Stillman. This certificate authorizes the holder to receive or acquire and sell or transfer marine mammals from and to Alaskan Natives or other registered agents. The certificate was issued on January 22, 1979, and expires on January 31, 1981.

New certificate PRT 2-3766-RA. Silver Eagle Taxidermy, 724 West 45th St., Anchorage, Alaska, Clifford Jeska. This certificate authorizes the holder to receive or acquire and sell or transfer polar bear (Ursus maritimus) skins from and to Alaskan Natives or other registered agents. This certificate was issued on March 14, 1979, and expires on February 28, 1981.

Renewed certificate PRT 2-2105-RA. New Method Fur Dressing Co., 131 Deacon St., South San Francisco, Calif., Renaldo Pepi. This is a renewal of Registered Agent Certificate RA-9. It authorizes the holder to receive or acquire and sell or transfer polar bear (Ursus maritimus) skins from and to Alaskan Natives or other registered agents. The certificate was issued on April 17, 1978, and expires on December 31, 1979.

Renewed certificate PRT 2-2129-RA. Coast to Coast Furs, Inc., North 11520 Market St., Mead, Wash., Jerome J. Knapp. This is a renewal of Registered Agent Certificate RA-7. It authorizes the holder to receive or acquire and sell or transfer polar bear (Ursus maritimus) skins from and to Alaskan Natives or other registered agents. The certificate was issued on April 20, 1978, and expires on December 31, 1979.

RESEARCH

The marine-mammal research-related objectives of the Fish and Wildlife Service are to actively carry out the Service's mandates under the Marine Mammal Protection Act and to determine the ecological effects of energy-resource-development-related human activities on marine wildlife. In order to meet these objectives, considerable survey work, accumulation of information, and detailed analyses of population data remain to be accomplished. Review of worldwide marine mammal research literature and preparation of status reports continue to be important efforts in the overall research program.

In July 1978, the Service published a report on the West Indian Manatee Workshop held in Orlando, Fla., in March 1978 (see account in "Research" in the 1978 annual report). This report, prepared by the Service's Division of Wildlife Ecology Research, National Fish and Wildlife Laboratory (NFWL), summarized the information presented at the workshop regarding the current knowledge of these animals, and detailed those research and management recommendations that had been identified.

In April 1978, the Marine Mammal Tagging Office began activities in the Marine Mammal Section of the NFWL. The office, funded jointly by the Service and the NMFS, is guided in general by the recommendations in the "Report on the marine mammal tagging and marking workshop, Laurel, Maryland, 1976" (see 1977 annual report), and by a steering committee composed of Service, NMFS, and Marine Mammal Commission (MMC) personnel, aided periodically by non-Government consultants. Its functions include (1) communication and coordination, (2) archiving, and (3) research and development.

A major office objective during the report period was to identify all sources of information concerning marine mammal tags and marks and methods of tagging and marking. A questionnaire was sent to more than 200 researchers in 20 countries who are known to be using or to have used tagging or marking techniques, requesting information on their past, present, and future tagging programs, and informing them of the function of the office. Eighty-seven replies were received. Samples and literature were requested from 21 manufacturers and suppliers of tags, marking material, and wildlife radio transmitters. Concurrently, a comprehensive and continuing literature search has identified over 300 scientific papers dealing with marine mammal marking and tagging, copies of which are on file in the office.

As part of the continuing program of tag and mark evaluation, the office contacted most active investigators in North America and participated in the following tests and field studies.

1. Laser branding tests on captive Pacific white-sided dolphins at Sea World, San Diego, on August 22, 1979. Thomas P. Dohl (University of California, Santa Cruz) is conducting this research under a Marine Mammal Commission contract.

2. Prototype radio transmitter attachment tests on three free-ranging California gray whales in Laguna San Ignacio, Baja California Sur, Mexico, during February 1979. B. R. Mate (Oregon State University) conducted this research under contract to the Naval Arctic Research Laboratory.

3. Naphtha-based paint marking tests on a free-ranging California gray whale in Laguna San Ignacio, Baja California Sur, Mexico, during February 1979. William A. Watkins (Woods Hole Oceanographic Institution) loaned the equipment to the tagging office for this test.

4. Two radio attachment tests on free-ranging West Indian manatees. A saltwater test was conducted by A. Blair Irvine (NFWL, Gainesville Field Station) in Brevard County, Fla., on August 13-20, 1978. The other test was conducted under a NFWL contract in freshwater in Volusia County, Fla., by John Bengtson on January 7-9, 1979.

5. Cattle ear tag, radio transmitter attachment, and capture method evaluation on free-ranging sea otters in San Luis Obispo County, Calif., on September 25-29, 1978. Ronald J. Jameson (NFWL, Piedras Blancas Field Station) is conducting this research as an ongoing NFWL program.

6. Cattle ear tag, radio transmitter attachment, and capture method tests and evaluation on free-ranging harbor seals in Netarts Bay, Oreg., on October 1-3, 1978. Robin Brown (under the supervision of B. R. Mate) is conducting this research using Sea Grant funds.

7. Meeting to evaluate ballistic whale transmitter and to recommend guidelines for its further development and testing. William A. Watkins and William E. Schevill (Woods Hole Oceanographic Institution) developed and initially tested the transmitter under Office of Naval Research funding and further tested the device under NMFS funding.

8. Evaluation of a prototype cattle tag developed by Hamelly International, which shows promise for marine mammal applications. The tests were made on cattle in Dillon, Mont., on October 18, 1978.

Satellite telemetry has been identified as one of the most important tools that can be developed for research on migratory marine mammal species. The Service therefore convened a meeting on October 24, 1978, with representatives of the National Aeronautics and Space Administration,

National Science Foundation, FWS, NMFS, and MMC to discuss the potential for multiagency development of sophisticated satellite-related technology applicable to marine mammal investigations. All parties agreed that current user needs should be identified and a program plan developed. In subsequent meetings with FWS, NMFS, and others interested in utilizing satellite capabilities, many biological applications have been identified, and a satellite telemetry program is being developed.

The tagging office, with partial funding from the MMC and in conjunction with the American Institute of Biological Sciences and the Marine Mammal Division of the Northwest and Alaska Fisheries Center, sponsored a Pinniped and Sea Otter Tagging Workshop on January 18-19, 1979, in Seattle, Wash., to review tagging and marking programs and tag and mark types and materials, and to consider experimental design, population estimation, and veterinary aspects of tagging. Participants from the United States, Canada, and Australia included veterinarians, representatives of the public display industry, and researchers from State and Federal agencies and the academic community. Recommendations were made concerning communication within the user community, captive animal studies, criteria for tag and mark evaluation, research and development of tags and marks, target species for tag and mark studies, and experimental design considerations. Also, special research considerations were given for sea otters, phocid (true or earless) seals, and otariid (eared) seals. A workshop report will be published in June 1979.

Research conducted in-house and by contract is summarized below.

In-house

1. Polar bear investigations:

    a. Biology and ecology of Alaska coastal populations.
    b. Den ecology and distribution.
    c. Biological parameters of bears of Chukchi Sea.
    d. Biology and ecology of bears of Arctic Ocean.
    e. Summer distribution and ecology of bears.
    f. Satellite tracking of bears.
    g. Estimation of Alaska population size and productivity.
    h. Reproductive biology of populations.
    i. Annual status report.

2. Sea otter and marine otter investigations:

    a. Annual and seasonal distribution, abundance, and composition of populations of sea otters and other marine mammals in Prince William Sound, Alaska.
    b. Biology and management needs for California sea otters.
    c. Interactions between sea otters and the nearshore community.

d. Parasites and environmental contaminants in sea otters.
e. Determination of status of marine otters.
f. Annual status reports on sea and marine otters.

3. Walrus investigations:

a. Biological activities of Pacific and Atlantic walruses.
b. Parasites and environmental contaminants in walruses.
c. Annual status reports on Pacific and Atlantic walruses.

4. Manatee and dugong investigations:

a. Determination of causes of manatee mortality and study and salvage of stranded manatees and other marine mammals.
b. Development of manatee tagging and tracking technology.
c. Definition of ecosystem relationships of manatees and assessment of effects of habitat alterations.
d. Basic sensory and physiological parameters of the West Indian manatee as related to technical needs.
e. Basic reproductive and behavioral characteristics of West Indian manatees.
f. Influence of warm water effluents on manatee distribution and movements around selected powerplants.
g. Parasites and environmental contaminants in manatees and dugongs.
h. Distribution and status of all manatee taxa and populations; annual status reports.
i. Distribution and status of all dugong populations; annual status report.

5. Other marine mammals: Biological studies, in cooperation with the NMFS, to determine status of Hawaiian monk seal population.

6. Marine mammal tagging:

a. Serve as clearinghouse and information center for marine mammal tagging operations.
b. Stimulation of research and development of marine mammal tags and techniques.

Contracts

1. Study marine and terrestrial ecosystems and habitats, with emphasis on marine mammals and land use problems. Principal investigator: W. Doyle, University of California, Santa Cruz ($18,000).

2. Study marine ecosystems and habitats, with specific reference to manatees. Principal investigator: Daniel K. Odell, University of Miami ($8,000).

3. Study Aleutian nearshore community ecology--sea urchin growth and fecundity. Principal investigator: C. A. Simenstad, University of Washington ($13,000).

4. Study parasites and diseases of the West Indian manatee. Principal investigator: D. Forrester, University of Florida ($8,000).

5. Sea otter/walrus/manatee research project. Principal investigator: Donald B. Siniff, University of Minnesota ($62,630).

6. Study ecology and behavior of the West Indian manatee in the St. Johns River, Fla. Principal investigator: Donald B. Siniff, University of Minnesota ($40,000).

OUTER CONTINENTAL SHELF (OCS) ENVIRONMENTAL STUDIES

During the report period, the Service's Office of Biological Services (OBS) contracted with the Hubbs/Sea World Research Institute to investigate whether underwater sounds of killer whales (Orcinus orca) could be used to cause avoidance behavior in diving seabirds. These birds, such as grebes, ducks, loons, and alcids, are particularly susceptible to the effects of oil spills and other types of aquatic pollution because of their diving and swimming habits and because their typical avoidance behavior involves diving rather than flying. The investigation was prompted by reports that killer whale sounds were effective in causing avoidance behavior in jackass penguins (Sphenicus demersus) and marine mammals. However, the study results showed that underwater sound playback of white noise, sweep frequency, and several types of killer whale vocalizations neither caused avoidance behavior in captive or wild diving birds nor prevented diving behavior.

In July 1978, the OBS asked the National Fish and Wildlife Laboratory (NFWL) to respond to a request from the Bureau of Land Management (BLM) to serve on its Technical Proposal Evaluation Committee (TPEC) for a "Marine mammals and marine turtles characterization in the Mid- and North-Atlantic areas of the U.S. Outer Continental Shelf." Meetings of the TPEC were held in July, August, and September to evaluate proposals and subsequent revisions and to make recommendations to the BLM. A contract for the characterization was awarded to the University of Rhode Island on September 30, 1978.

On November 21, 1978, the NFWL responsed to another OBS request from the BLM to review a draft work statement for a "Study of the effects of oil on marine mammals" and a study of the effects of human disturbance associated with OCS development on marine mammals. Further review of the work statement took place on December 22, 1978, and March 20, 1979, in preparation for a Request for Proposals to be issued in April 1979. A contract is expected to be awarded before the end of fiscal year 1979.

ECOLOGICAL CHARACTERIZATIONS OF U.S. COASTAL AREAS

The Service's Office of Biological Services is managing a group of studies known as ecological characterizations, funded by Environmental Protection Agency pass-through funds and the Bureau of Land Management. Six characterizations are currently being prepared under contracts:

1. Ecological characterization of the rocky coast of Maine. Project officer: Stewart Fefer, Region 5, U.S. Fish and Wildlife Service.

2. Ecological characterization of the Sea Islands and coastal plain of South Carolina and Georgia. Project officer: Lee Barclay, Region 4, U.S. Fish and Wildlife Service.

3. Ecological characterization of the Mississippi Deltaic Plain region. Project officer: James B. Johnston, National Coastal Ecosystems Team.

4. Ecological characterization of the Chenier Plain of southwest Louisiana and southeast Texas. Project officer: James B. Johnston, National Coastal Ecosystems Team.

5. Ecological characterization of the northern and central California coast. Project officer: Jay Watson, Region 1, U.S. Fish and Wildlife Service.

6. Ecological characterization of the Pacific Northwest coastal region. Project officer: Jay Watson, Region 1, U.S. Fish and Wildlife Service.

An ecological characterization is a structured synthesis of existing information on the functional relationships of ecosystem processes and components. This ecosystem information base is designed to assist decisionmakers in comprehensive coastal resource planning and management. Each of the characterizations now underway will contain a section on marine mammal life histories, species abundance and distribution (including limiting factors), migration routes, statistics on harvest by man, and habitat preferences and requirements. The Chenier Plain characterization is scheduled for completion in fiscal year 1979, the Pacific Northwest and the northern and central California coast characterizations in fiscal year 1980, and the remaining three characterizations in fiscal year 1981. Long-range plans call for the eventual characterization of all U.S. coastal areas.

INTERNATIONAL ACTIVITIES

The international marine mammal program is an integral part of the Service's overall program. The Service continues its efforts to achieve

the objectives of the Marine Mammal Protection Act through international cooperation. The following accounts detail the principal thrust of the international program during the report period.

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

The objective of this project is the development of cooperative bilateral research on the biology, ecology, and population dynamics of marine mammals of interest to both the United States and the Soviet Union, thereby contributing to the sound management and protection of these animals. The Service and the NMFS oversee U.S. participation in the project.

A meeting of the U.S.-Soviet Marine Mammal Working Group was held in July 1978 in Ulan-Ude, U.S.S.R. A resolution was drafted recommending that the U.S.-U.S.S.R. Joint Committee on Environmental Protection urge the governments of the two countries to initiate negotiations toward a bilateral convention protecting walruses and ice seals.

The schedule for a joint compendium on pinniped and sea otter research was reexamined, and concrete deadlines were established for completion and submission of manuscripts by both sides (December 1978), with the target date for publication established as late 1979. In addition, a preliminary schedule was established for development and submission of manuscripts on cetacean research for volume II of the joint compendium. All participants felt that the successful publication of these two compendia will establish a major precedent for cooperative bilateral programs of this kind.

Completing joint activities in 1978, two Soviet scientists participated in a pinniped research cruise on the U.S. research vessel Surveyor in the Bering Sea during May and June, and a U.S. scientist participated in a pinniped research cruise on the Soviet research sealer/trawler Zubarevo in the Bering and Chukchi Seas during August. Two other Soviet scientists studied marine mammal capture and maintenance procedures and met with international experts on odontocete (toothed whale) aging procedures in San Diego in September.

At its seventh annual meeting, held in Moscow on January 29-February 2, 1979, the U.S.-U.S.S.R. Joint Committee on Environmental Protection reviewed work carried out during 1978 and adopted a program for 1979. U.S. biologists will visit the U.S.S.R. later this year to participate in studies of the Baikal seal and to work with osteological collections of ice seals and walrus. The two sides will also exchange data on gray whales, sea otters, harbor seals, and northern sea lions. Soviet specialists will visit Alaska to take part in bowhead whale aerial surveys and ringed seal studies, and other Soviet biologists will work at Hubbs

Sea World (La Jolla, Calif.) on new methods of evaluating populations, biology, and functional morphology of pelagic dolphins.

The Joint Committee also decided that both sides will explore further the question of the desirability of a Convention for the Protection of North Pacific Marine Mammals, and will deliver their views after consultation with appropriate offices.

Excess Foreign Currency Programs

During the report period, the Service received Congressional authorization for continued use of excess foreign currencies held by the U.S. Government in Egypt, India, and Pakistan. These authorizations were requested under section 8 of the Endangered Species Act, which allows such funds to be expended on projects deemed by the Secretary of the Interior to be necessary or useful for the conservation of endangered or threatened species.

As part of the program in Egypt, an international workshop hosting representatives from over 20 countries and 9 international agencies was convened in Cairo in November 1978. Designed to concentrate on managing wildlife in arid ecosystems, the conference covered a wide variety of subjects dealing with threatened and endangered species including marine mammals. A joint contract is underway that will enable the Egyptians to fund surveys and gather data on species not yet listed, develop wildlife management plans, and propose parks or other protected areas, and it is beginning to yield valuable data with which the Egyptians can more effectively manage their wildlife resources. Two additional contracts, recently signed, include the development of a national wildlife library and a consultation under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The latter contract has already resulted in the sending of a Service employee to Egypt to discuss management authority considerations under the CITES and to brief the Egyptian authorities on the CITES Conference of Parties held in Costa Rica in March 1979. The contract also provided for Egyptian participation at the Costa Rica conference.

Negotiations with Pakistan have resulted in three draft contracts for threatened and endangered species research, management, and education and training. These contracts will allow the Pakistan National Council for Wildlife Conservation to release moneys for project proposals already approved under the National Conservation Strategy. Included under this strategy is a project for the Indus River dolphin. A similar program is underway in India involving the Ganges River dolphin and the dugong.

During the report period, the Service received informal sighting reports of dugongs in the Gulf of Aqaba (Red Sea), but no comprehensive status reports or population surveys were accomplished.

U.S.-Canada Polar Bear Technical Committee

The 10th meeting of the committee was held in Edmonton, Alberta, Canada, on January 16-17, 1979, and was attended by representatives of Alaska and all Canadian provinces that have polar bears. The main topics of discussion were polar bear management changes in North America and the joint U.S.-Canada satellite tracking effort, under which 11 bears will be radio-tagged in 1979 in Alaska, Canada, and Greenland. This committee coordinates its efforts with the IUCN (International Union for Conservation of Nature and Natural Resources) Polar Bear Specialist Group, with central coordination provided by the Service's National Fish and Wildlife Laboratory.

International Union for Conservation of Nature and Natural Resources (IUCN), Survival Service Commission Polar Bear Specialist Group

The seventh meeting of the Polar Bear Specialist Group (PBSG) was held in Copenhagen, Denmark, on January 30-February 1, 1979. The nine delegates and four invited specialists discussed a wide range of topics but concentrated on past research, current research programs (particularly satellite tracking and oiling experiments), the effectiveness of national and international protection of polar bears and their habitat, and the merit of publishing a booklet on the activities and successes of the PBSG. The invited participants reported on their work on ecophysiology, systems modeling, remote sensing, and mark/recapture studies.

Among subjects addressed in delegates' reports on their respective national research projects, the Danish delegate noted that home rule will take effect in Greenland on May 1, 1979, the management- and research-related effects of which were not then known; a U.S. delegate described the status of the Alaska marine mammal waiver (see "Waiver of the moratorium for nine species of marine mammals") and noted that Alaskan Natives have sued the Federal Government to prevent return of management to the State (see "Legal actions against the Department of the Interior"); a Canadian delegate described the reasons for raising the Canadian polar bear annual quota from 648 to 719, noting that 64 of the additional animals will be involved in scientific research; and a Norwegian delegate reported that Norway had no plans to change the protected status of polar bears after its 5-year moratorium ended in 1978.

Future Canadian research, described briefly, will involve satellite tracking, population dynamics (mark/recapture), and oiling, behavioral, and deterrent/attractant studies. Danish research will focus on bear surveys in Wilhelmina Bay, Greenland, and on satellite tracking. Norwegian research will involve den surveys every second year, satellite tracking, and studies of bears' den emergence behavior. U.S. research will include satellite tracking/radio collar work to study bear movements and denning, initiation of community studies, and continuation of

a mark/recapture program. (A U.S. delegate, the Service's polar bear specialist, was selected to coordinate the Canadian, Danish, Norwegian, and U.S. satellite tracking work.) Soviet research will involve studies of polar bear skull morphology, trace element analyses, and the last year of tagging at Wrangel Island, where as many as 20 animals will be tagged in 1979. (The Soviet delegate was chosen to be chairman of the PBSG for the next 2 years.)

Subject to a definitive decision, the next meeting of the PBSG may be in Oslo, Norway, in 1980 to coincide with a meeting, proposed by Norway, for the signatories to discuss the international Agreement on the Conservation of Polar Bears 1 year before that agreement is scheduled to expire. For further information on the agreement, see the account concluding this section of the report.

U.S.-Ecuador Amazonian Manatee Research

In February 1979, the Service's National Fish and Wildlife Laboratory conducted a 10-day survey of the Amazonian manatee (Trichechus inunguis) in Ecuador. No manatees were seen but strong evidence of their presence was found.

International Meeting on Marine Mammals of Baja California

The IV Reunion Internacional Sobre Mamiferos Marinos de Baja California was held in La Paz, Baja California Sur, Mexico, on February 15-16, 1979, under the cosponsorship of the Center for Biological Investigations of Baja California Sur and the University of Baja California Sur. Formal papers were presented in public sessions on the migration, population estimation, tagging, and behavior of the California gray whale; a mass stranding of sperm whales near Santa Rosalia, Baja California Sur, in January 1979; aerial survey and population census of the California sea lion; research considerations for the study of sea otters and their habitat; and the marine mammals of the Sea of Cortez. On the afternoon of the second day, participants met in separate working groups to discuss cetacean, pinniped, sea otter, and manatee research problems of mutual concern. The reports of each group were accepted as general resolutions later that evening.

The working groups made the following recommendations: (1) Continue the manatee census program in Mexico and develop a Mexican manatee research program; (2) survey sea otter habitat throughout its historical range in Baja California, obtain data on historical sightings and the abalone fishery, and distribute information on sea otters to fishing villages; (3) continue the research projects on gray whales in the Baja California lagoons; (4) close the upper two-thirds of Laguna San Ignacio from the arrival of the first gray whale until the departure of the last; (5)

create a marine mammal stranding network to insure that opportunistic specimen materials are acquired and processed in a timely and professional manner; (6) promote the cooperative development and testing of tags and marks for marine mammals; and (7) conduct a pinniped survey on Isla de Guadalupe and continue the California sea lion research in the southern Sea of Cortez.

During the meeting, the Mexican participants announced the formation of a new society, officially called "Sociedad Mexicana por los Estudios de Mamiferos Marinos." The society is registered as being located in La Paz at the Centro de Investigaciones Biologicas de Baja California Sur. Written by-laws of the society have been approved. Further information about the society can be obtained from the National Fish and Wildlife Laboratory.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

The second biennial meeting of the Conference of the Parties was held in San José, Costa Rica, on March 19-30, 1979. Thirty-four of 51 party nations attended, along with observers from 16 non-party nations and 55 conservation and wildlife organizations. Principal actions of the conference included: A resolution on funding of the Secretariat, the creation of a 9-member standing committee, a request to the United Nations Environment Programme for funding of an identification manual and a standardized taxonomy, the defeat of a European proposal to establish a list of animal parts and derivatives to be controlled, the adoption of an effective procedure for the exchange of museum and herbarium specimens, the adoption of guidelines for the humane shipment of living specimens, the adoption of a resolution calling for a committee to harmonize permit forms, the acceptance of standard interpretation of the exemption for animals that are bred in captivity or plants that are artificially propagated, the adoption of a standard format for proposals to amend appendix I and II, and the adoption of 103 of the 249 proposed amendments to the list of species in the appendixes.

The parties took the following significant actions at San José with regard to marine mammals: (1) They adopted a proposal by the United Kingdom to include all cetaceans in appendix II (species potentially threatened with extinction) except for those included in appendix I (the most threatened species), (2) they adopted other United Kingdom proposals to include six species or genera of small cetaceans in appendix I, (3) they adopted proposals by the United States to transfer the northern elephant seal from appendix I to appendix II and the Guadalupe fur seal from appendix II to appendix I, and (4) they adopted a resolution presented by the United States to the effect that permits should not be granted for commercial trade under CITES in products of whales classified as "Protection Stocks" by the International Whaling Commission.

No action was taken on a U.S. provisional proposal, seriously considered earlier in the report period, that would have moved the California population of sea otters from appendix I to appendix II. The United States withdrew this and two other provisional proposals before the Conference of the Parties met.

Agreement on the Conservation of Polar Bears

This agreement commits the United States and the other signatories, Canada, Denmark, Norway, and the U.S.S.R., to protecting polar bear habitat components, especially denning and feeding sites and important migration areas. It further commits them to managing polar bear populations with sound conservation practices based on the best available scientific data, and it prohibits hunting, killing, and capturing bears except for listed specific purposes and by limited methods.

In 1979, Norway submitted a letter to the International Union for Conservation of Nature and Natural Resources, recommending a meeting of signatory nations in 1980 to review the agreement.

PART II--SPECIES STATUS REPORTS

INTRODUCTION

Status reports have been prepared for the eight species over which the Secretary of the Interior has jurisdiction under the terms of the Act. Information about each species is summarized under seven major headings: distribution and migration, abundance and trends, general biology, ecological problems, allocation problems, regulations, and current research. (To convert the metric measurements used in the reports to their English (U.S. customary unit) equivalents, multiply as follows: millimeters X 0.03937 = inches, centimeters X 0.3937 = inches, meters X 3.281 = feet, kilometers X 0.6214 = miles, kilograms X 2.205 = pounds, liters X 1.057 = quarts, and 1.8 X degrees Celsius + 32 = degrees Fahrenheit.) A partial bibliography for each species is included at the end of this part.

The Act defines a marine mammal as "any mammal which (A) is morphologically adapted to the marine environment (including sea otters and members of the orders Sirenia, Pinnipedia and Cetacea), or (B) primarily inhabits the marine environment (such as polar bears); and for the purposes of this Act, includes any part of any such marine mammal, including its raw, dressed, or dyed fur or skin."

SPECIES LIST

Carnivora

Ursidae

Ursus maritimus (Polar bear)

Mustelidae

Enhydra lutris (Sea otter)
Lutra felina (Marine otter)

Pinnipedia

Odobenidae

Odobenus rosmarus divergens (Pacific walrus)
Odobenus rosmarus rosmarus (Atlantic walrus)

Sirenia

Trichechidae

Trichechus manatus (West Indian manatee)
Trichechus inunguis (Amazonian manatee)
Trichechus senegalensis (West African manatee)
Dugong dugon (Dugong)

STATUS REPORTS

Polar bear
(Ursus maritimus)

Distribution and migration. Polar bears are limited to the Northern Hemisphere and are in most cases closely associated with Arctic sea ice. Centers of relatively isolated populations in the Polar Basin are Wrangel Island-western Alaska, northern Alaska, northern Canada, Greenland, Svalbard Islands-Franz Joseph Land, and central Siberia. Separate populations also occur in Hudson Bay, Canada.

Polar bears are most abundant near the southern edge of the sea ice, although they occur throughout the Polar Basin as far north as latitude 88° N. Extensive north-south movements accompany seasonal changes in the position of the southern ice edge. In winter, bears typically occur as far south as Bering Strait and may reach St. Lawrence Island or St. Matthew Island in the Bering Sea on occasion. The summer ice edge position is normally between latitudes 71° and 72° N. Pregnant females concentrate primarily on certain Arctic islands of the Soviet Union and the Svalbard group and in Canada to den and bear young during winter.

Abundance, trends, and harvest. Worldwide population estimates range from 10,000 to 20,000 polar bears. These estimates are based on broad assumptions and should be interpreted cautiously. The abundance of bears off the Alaska coast and the magnitude of sustained harvesting over many years suggest that the estimate of 20,000 bears may be conservative. Alaska Natives harvested about 120 bears per year between 1930 and 1960. Aircraft-supported trophy hunting began in the late 1940's. The total annual bear harvest thus gradually increased to about 260 by 1972. Airborne hunting guides provided reliable data on bears seen per hour of flying during 1956-69. No trend in bear numbers was apparent during this period. Eighty-seven percent of the bear harvest was taken with the use of aircraft during 1961-72. Of this fraction, 70 to 80 percent were males. In spite of the reduction in numbers of mature males, the percentage of females with young remained high in Alaskan populations. The age structure of bears harvested west of Alaska did not change during the period of aircraft-assisted hunting. Ages of bears harvested north of Alaska decreased in 1970 and 1971, then increased in 1972, possibly reflecting heavy harvests in 1966 and 1967 followed by hunting restrictions and reduced harvests. The subsistence harvest by Natives since passage of the Marine Mammal Protection Act was 7 in 1973, 50 in 1974, 60 in 1975, 167 in 1976, 81 in 1977, and 59 in 1978. The large harvest in 1976 resulted from heavy ice conditions which made bear populations more available to the Inuit Natives of the northwest Alaska coast and St. Lawrence Island.

Soviet scientists suggest that polar bear populations in the Soviet Arctic were declining before the imposition of strict harvest limits in 1956, after which bear numbers seem to have stabilized. The annual

worldwide bear harvest is now about 900 to 1,000 (10 to 15 in the Soviet Union, 600 to 700 in Canada, and 125 to 150 in Greenland--as well as those harvested by Alaska Natives).

General biology. Polar bears are solitary most of the year except for females with young. Males actively seek out females during late March, April, and May by following tracks on sea ice. Polar bears are serially polygamous. A male remains with a female for a relatively short time, then seeks another. Delayed implantation probably occurs.

Pregnant females seek out denning sites in October and November. Known areas of denning concentration are on Wrangel Island (Soviet Union), the Svalbard Islands (Norway), and near Cape Churchill on Hudson Bay. Scattered denning also occurs along the Greenland coast, along the Arctic coast of Alaska, and in the heavy pack ice north of Alaska. Dens are formed under coastal or river banks or on slopes where snow drifts. A denning female forms a depression in the snow, then maintains and enlarges a chamber as snow drifts over her. Young are born in December and typically weigh less than 1 kilogram. Litters of two cubs are most common, but single births occur frequently. Litters of three are rare. The female and cubs break out of the den in late March or early April when cubs weigh about 7 kilograms. Short trips are made to and from the den for several days as cubs acclimate to outside temperatures. The family group then travels to sea ice if the den is on land. Young polar bears usually remain with the mother for about 28 months.

Females produce first litters at an age of 4 to 8 years. Some females produce a litter every third year, but the interval between litters is longer for other females. Males are sexually mature at an age of 4 years. Polar bears rarely live longer than 25 years. Among bears north of the Alaskan Arctic coast, mature females typically weigh 200 to 300 kilograms; mature males weigh 300 to 600 kilograms. Bears west of Alaska are somewhat larger.

Polar bears feed primarily on ringed seals. Bearded, harp, and hooded seals and walrus are also frequent prey. Whale, walrus, and seal carrion is occasionally eaten. Small mammals, birds, eggs, and vegetation are consumed when other food is not available. About 60 percent of Alaskan bears harbor the internal parasite Trichinella spiralis, apparently obtained by eating marine mammals, garbage, and possibly bear carcasses. Polar bear liver has a high vitamin A content and is toxic if eaten.

Ecological problems. Long-term climatic variations may have a significant effect on polar bear populations. Denning sucess declines in warm years because available denning areas are reduced. Years of light snow or light winds (which reduce drift formation) also depress denning success of both polar bears and ringed seals. Patterns of ice formation and movement are crucial to denning success rates.

The greatest immediate threat to polar bear populations is human development of fossil fuel resources in the Arctic region. Such development in principal denning areas may cause females to try denning in less suitable locations or to break out of dens sooner than normal, reducing cub survivorship. The possibility of oil spills could lead to fouling of bear fur, seriously reducing its insulative efficiency. The potential for development of petroleum resources now exists for the entire Alaskan Arctic coast, an area which supports many polar bears.

Mercury and low levels of DDT and PCB's have been found in tissue samples of all Alaskan bears that have been tested.

Allocation problems. A full range of opinion exists in the United States regarding polar bear management options, which include complete protection, limited harvest for native subsistence, and maximum sustained harvest primarily by trophy hunters. The restriction of polar bear hunting to Natives is currently viewed as discriminatory by non-Native residents of the Arctic coast. New conflicts will certainly arise as continued economic development of the Arctic region increases the frequency of encounters between bears and people.

The Soviet Union restricts taking of polar bears off the Siberian coast to a few cubs each year for delivery to zoos. This reflects the Soviet view that Siberian bear stocks are reduced. Before 1971, Norwegian sealers killed bears as predators, Svalbard trappers used baited set guns to obtain hides to sell, and trophy hunters took bears from Norwegian boats in the summer. These activities are now prohibited by a moratorium on bear killing imposed by the Norwegian Government in 1973. Polar bear harvesting in Greenland has been limited to Natives and long-term non-Native residents, primarily for subsistence and skins for personal use. Home rule of Greenland becomes effective on May 1, 1979. It is not presently known how this will affect management of Greenland polar bear populations.

The Canadian harvest has traditionally been restricted to Natives who hunt for subsistence and to obtain skins to sell. Trophy hunting from the ground has been encouraged by management agencies in parts of Canada but has seen little development because Natives, needed as guides by trophy hunters, can realize more profit from selling skins than from guiding.

Regulations. Past management practices in Alaska included seasons, bag limits, a permit system, limits on numbers of hunts in which a guide could participate, and protection for young and females with young. Management areas were established to the west and north of the State. Residents could hunt bears for food from the ground at any time. Alaska Department of Fish and Game representatives examined and sealed skulls and hides from all bears taken and also removed teeth for age estimation. The season was lengthened to encourage ground hunting when the State banned aircraft-assisted hunting in July 1972.

Alaskan polar bear management authority was transferred to the Federal Government by the Marine Mammal Protection Act of 1972 (MMPA). Under the Act, bear harvesting is limited to coastal Indians, Aleuts, and Eskimos for subsistence and the creating and selling of authentic native articles of clothing and handicrafts. The Act does not prevent these Natives from taking young bears and females with young. The State has requested that the MMPA moratorium on taking be lifted and that management authority be returned. The proposed State management plan provides for both sport and subsistence hunting with a maximum total annual harvest of 170 bears. The plan prohibits aircraft-assisted hunting and sets a season (October 15 through May 31) which effectively eliminates hunting from boats. Bag limits are set, and young bears and females with young are fully protected. The Fish and Wildlife Service issued regulations on January 11, 1979, that waive the MMPA moratorium and will allow return of management after the Service approves Alaska laws and regulations as being consistent with the MMPA and relevant Federal regulations.

The Agreement on Conservation of Polar Bears was ratified by the United States in 1976. Other member nations are Canada, Denmark, Norway, and the Soviet Union. The agreement limits the hunting of polar bears to areas of traditional harvesting and prohibits the use of aircraft and large motorized vessels as hunting aids. The agreement seeks improved national and cooperative international research and management, especially for oceanic populations or populations which occupy more than one nation, and it protects the ecosystems of which polar bears are a part. Protection is sought for denned females, females with cubs, and cubs, and a call is issued for improved control of traffic in hides. The latter goal is now being achieved through the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

Current research. The governments of Canada, Denmark, Norway, the Soviet Union, and the United States are all supporting long-term studies of polar bear biology. Top international research priorities include the description of population trends, the identification of critical denning and feeding areas, and the characterization of population discreteness. All nations in which polar bear hunting occurs have active harvest monitoring programs. An international effort is underway to develop and use satellite tracking methods to study bear movement. International cooperative research is being coordinated by the International Union for the Conservation of Nature and Natural Resources. Canadian research includes studies of bear population dynamics and behavior, effects of oiling, and deterrence/attractance. Danish studies include surveys of populations in Greenland and satellite tracking work. Norway supports biennial den surveys, study of den emergence behavior, and satellite tracking. The Soviet Union conducts analyses of skull morphology and trace elements and does tagging work at Wrangel Island. The U.S. Fish and Wildlife Service and the State of Alaska employ biologists whose current efforts focus on the use of satellite tracking to study denning, routes of migration, and critical feeding areas, on mark/

Figure 5. Service biologist attaching ear tag to temporarily immobilized polar bear off Barrow, Alaska, April 1978. Photo by R. L. Brownell, Jr., National Fish and Wildlife Laboratory.

recapture studies, and on monitoring of harvest. Fish and Wildlife Service biologists will tag up to 200 bears, some with transmitter collars for satellite tracking or radio telemetry, over the next few years for these studies. New studies of relationships between polar bears and marine communities are being developed.

Sea otter
(Enhydra lutris)

Distribution and migration. Populations occur in the shallow coastal waters of the North Pacific Ocean. Before exploitation by the fur trade, sea otters occurred along the west coast of North America from Morro Hermosa, Baja California, northward to Prince William Sound, Alaska, westward through the Aleutian, Pribilof, and Commander Islands, and southward along the southern Kamchatka Peninsula, through the Kurile Islands, to northern Hokkaido and southern Sakhalin. Sea otters seldom occupy waters deeper than 55 meters. Populations are year-round resident and do not migrate.

Abundance and trends. Hunting by fur traders reduced sea otters to widely scattered groups of a few tens or hundreds of animals by 1900. Sea otters were first accorded protection by international treaty in 1911. Remnant populations have grown and reoccupied some portions of the aboriginal range. The Alaska Department of Fish and Game estimated the total number of sea otters in all Alaskan waters to be between 100,000 and 120,000 in 1973. Recent surveys indicate a total California population of about 1,800, ranging between Año Nuevo Island (north of Santa Cruz) and Pismo Beach.

During the period 1965-72, sea otters from Amchitka Island and Prince William Sound were translocated to the Pribilof Islands, southeastern Alaska, British Columbia, Washington, and Oregon. Young otters have since been observed in all translocated groups except the Pribilof Island group. It now appears that translocation efforts have succeeded in southeastern Alaska and British Columbia. Recent surveys indicated populations of about 500 sea otters off Baranof and Chichagof Islands, Alaska, and about 75 otters off Vancouver Island, British Columbia. Translocation success is questionable elsewhere. About 20 otters were recently found along the Washington coast and less than 10 off Oregon. Recently observed sea otters in the Pribilof Islands consist entirely of scattered singles or groups of six or less, all adults.

General biology. The sea otter is the largest member of the family Mustelidae, reaching a length of 147 centimeters and a weight of 45.5 kilograms. Females become sexually mature at about 4 years of age and bear single young weighing approximately 2.3 kilograms, usually biennially. Pups nurse for 6 to 12 months but are often provided with solid food by the mother before being weaned. Mothers are very attentive to their young. Most young are born during spring and summer, but mating and birth may occur in any season. Males mature at ages of 6 to 8 years. Breeding behavior is poorly understood but appears to be promiscuous or polygynous. Studies in progress should provide more definitive information on this behavior. A mating pair may remain together for several days, but this does not occur in all cases.

The dense underfur of the pelage is about 25 millimeters long; guard hairs are 30 to 35 millimeters long. Healthy sea otters may accumulate

body fat, but the blubber layer characteristic of most marine mammals is lacking. Sea otters rely entirely on the air blanket held by the underfur for insulation from cool (1.7° C to 18° C) marine waters.

Amchitka Island, Alaska, is the only area in which a sea otter population thought to be near carrying capacity has been studied intensively. Mortality at Amchitka is greatest in winter and early spring. Populations of food organisms have been depleted by otters, apparently resulting in starvation during stormy weather. Young animals accounted for 70 percent of the mortality. Most of the other dead were animals showing signs of old age. Most dead animals had symptoms of starvation and enteritis. Recent studies indicate a comparable but less distinct relationship between stormy weather and sea otter mortality in California. Small numbers of California otters die from shark attack. Known internal parasites of sea otters include Trematoda (4 spp.), Cestoda (2 spp.), Nematoda (1 sp.), and Acanthocephala (5 or 6 spp.).

Sea otters forage on benthic invertebrates of nearshore intertidal and subtidal habitats by diving to the bottom, gathering food, and carrying it to the surface to eat. Principal food items and foraging activity patterns vary considerably with location, sea otter density, and time since otters have reoccupied a given area. In California, otters near the ends of their expanding range may focus foraging effort on sea urchins, abalone, or clams, depending on the location, while those within the central portion of the range feed mostly on crabs and small snails. Sea otters in long-occupied portions of Prince William Sound eat a variety of small and large clams, mussels, and crabs, while those in newly reoccupied parts of the sound appear to focus on large clams, which must be dug from deep within mud bottoms. Otters in the high-density population at Amchitka Island eat fishes and large numbers of very small sea urchins, while those at sparsely occupied Attu Island feed almost entirely on large urchins. Sea otters are effective users of "tools" for opening hard-shelled prey such as clams or snails. Such prey are held in the forepaws and rapped sharply against flat stones or other hard-shelled prey balanced on the chest while the otter floats on its back on the surface.

Sea otters have a significant effect on the structure of nearshore marine communities in the Aleutian Islands. High-density otter populations deplete numbers of benthic herbivores, resulting in the development of luxuriant kelp populations and the concomitant expansion of fish stocks. Relationships between otters and bottom communities in Prince William Sound and California are less obvious but appear to be significant. These relationships are presently under active investigation.

Ecological problems. Alteration of the nearshore marine environment by human activity will almost certainly affect sea otter populations. There is little doubt that most sea otters that encounter spilled oil would suffer fouled pelage and die. Otters in California are occasionally lost to collisions with boat propellers. Pesticide residues have been found in California otters, but the effect is unknown.

Figure 6. Service biologist quadrant sampling intertidal zone as part of ongoing Service sea otter studies, Pisa Point, Attu Island, Alaska. Photo by C. A. Simenstad, University of Washington Fisheries Research Institute.

Allocation problems. Conflict exists over policies for managing the California sea otter population. Sea otters clearly reduce the numbers of certain prey species, some of which are desired by humans. Commercial and sport users of these resources prefer that the range and abundance of sea otters be limited. Preservation groups favor the reestablishment of sea otters throughout their aboriginal range. The question is complicated by uncertainties regarding indirect relationships between sea otters and large kelps, some of which are harvested commercially and may benefit from the presence of otters.

There is no commercial or subsistence harvest of sea otters at present.

Regulations. The sea otter is protected by the Marine Mammal Protection Act of 1972 (MMPA) (Public Law 92-522). The California population is listed as threatened under the Endangered Species Act of 1973 (Public Law 93-205) and is also fully protected by California State law. The State of Alaska has requested that the MMPA moratorium on taking Alaskan sea otters be waived and that management of these otters be transferred from Federal to State jurisdiction. The Fish and Wildlife Service issued regulations on January 11, 1979, that waive the moratorium and will allow return of management after the Service approves Alaska laws and regulations as being consistent with the MMPA and relevant Federal regulations. However, the State presently has no definite plans for sea otter harvesting.

Current research. The U.S. Fish and Wildlife Service employs three full-time biologists on studies of sea otter populations and their relationships with nearshore marine communities. The State of Alaska no longer assigns biologists to full-time sea otter research, but it does census otter populations. The State of California currently assigns three biologists to full-time and one to part-time sea otter research. The State began an intensive otter tagging program in California in 1978 and continues to monitor some effects of otter foraging on nearshore communities. The privately endowed Owings Foundation employs a full-time sea otter naturalist. Additional research is supported by the Marine Mammal Commission and the U.S. Department of Energy.

Marine otter
(Lutra felina)

Local common names. Gato marino, chungungo, hullaque, nutria de mar, and chinchimen.

Taxonomy. Two subspecies of marine otter have been described: L. f. felina from southern Chile has a slightly darker brown ventral surface than does L. f. peruviensis from northern Chile and Peru. Sufficient specimens are not currently available to permit detailed studies on the validity of these subspecies.

Distribution and migration. This species inhabits nearshore waters along the west coast of South America from central Peru (at least as far north as lat. 12° S.) south to Cape Horn, Chile. Nothing is known about its seasonal movements. It occurs mainly in the littoral region but is also known to ascend rivers to at least 650 meters above sea level.

Abundance and trends. Darwin found the marine otter to be abundant in the Chonos Archipelago and among the islands off the southwestern shores of Tierra del Fuego. It has diminished greatly in numbers since Darwin's time, but in 1923 the Chicago Field Museum Expedition found it to be common along the southern end of Isla de Chiloe, Chile. The number of marine otters along the northern coast of Chile is unknown, but in Peruvian waters the population is estimated to be between 200 and 300. In the Cape Horn and southern Tierra del Fuego region, the marine otter has been practically exterminated. One specimen was collected at Islas Wollaston, Tierra del Fuego, over 25 years ago.

General biology. The following external measurements have been recorded for the marine otter: head and body, 570 to 787 millimeters (mm); tail, 300 to 362 mm; and total length, 910 to 1,149 mm. An adult male taken at the southern end of Isla de Chiloe weighted 4.1 kilograms. Marine otters feed on the freshwater prawn, Criphiops caementarius; Darwin reported that they feed also on fish, "small red crab," "cuttle-fish," and the inhabitants of "volute shells." Sexual dimorphism was not detected in a small sample of marine otter specimens. All species of Lutra except L. provocax and L. felina are allopatric (occupying different geographic areas), and all except L. felina, a littoral marine species, are probably ecological equivalents. Lutra felina is the smallest and the most distinct species in the genus and, according to one investigator, "probably evolved from a stream-dwelling species that adapted to a marine environment after isolation in coastal habitats as a consequence of progressive aridity in middle latitudes of South America's west coast."

Parasites and diseases. Nothing is known about parasites or diseases in this species.

Allocation problems. In Peruvian waters, these otters are often shot by fishermen because of the alleged damage they do to the stocks of freshwater prawns. In Chile, especially south of Isla de Chiloe, these animals are hunted regularly by fishermen for their skins.

Ecological Problems. No specimens have been examined for pesticide residues or heavy metal contaminants.

Regulations. This species is listed as endangered in the Red Data Book of the International Union for the Conservation of Nature. On June 14, 1976, the marine otter was listed as an endangered species and, therefore, was afforded protection under the U.S. Endangered Species Act of 1973, which prohibits its importation into the United States for purposes other than scientific research and propagation. On July 1, 1975, it was listed also in appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, and on March 29, 1978, it was designated to be a marine mammal and thereby entitled to additional protection under the U.S. Marine Mammal Protection Act of 1972. In Peru, the marine otter has been found in three areas being considered as a coastal park, but it is not known if the species is local enough in habits to remain in any one of these areas throughout the year.

Current research. Research contracts are being established by the U.S. Fish and Wildlife Service in Peru and Chile. Carlos Cabello of the Corporaction Nacional Forestal, Chile, is studying marine otters around Isla de Chiloe, Chile.

Pacific walrus
(Odobenus rosmarus divergens)

Distribution and migration. The entire population winters on the seasonal pack ice of the Bering Sea where animals are distributed from eastern Bristol Bay to the area southwest of St. Lawrence Island. The exact distribution varies with the extent and quality of sea ice. The majority of breeding females apparently occurs in the north-central Bering Sea.

The northward migration begins in April; the exact timing of migration probably depends heavily on the pattern of sea ice recession, which may vary greatly from year to year. At least 15,000 males presently remain on or near Round Island in northern Bristol Bay. This number has probably increased by 2,000 to 3,000 over the past several decades. Recent preliminary data suggest the possibility of high turnover rates within the Round Island group and that the number of males using the site could be higher than previously estimated.

Following the northward migration into the Chukchi Sea, walruses disperse along the ice edge from about Pt. Barrow west to the Kolyma River in the east Siberian Sea. Apparently the routes of migration and the summer distribution vary considerably among years, depending on seasonal conditions.

During the southward migration, walruses frequently haul out to rest at Big Diomede and Punuk Islands and along the Soviet coastline until the pack ice becomes accessible. During the fall of 1976, biologists from the Soviet Union located nine such coastal haul-out areas between the north coast of Chukhotka and Cape Olyutorski.

Abundance and trends. The Pacific walrus population has increased during the past several decades, following a decline in abundance caused by overexploitation. The population may have numbered as few as 40,000 to 50,000 by about 1950. Aerial surveys of walruses were begun in 1960 and repeated in various forms in 1965, 1968, 1970, 1972, 1974, 1975, 1976, and 1977. The 1975 and 1976 surveys were coordinated efforts between the United States and the Soviet Union. Over 96,000 walruses were counted at coastal hauling areas along the Soviet coastline, and another 30,000 to 40,000 were estimated to occur along the ice edge west of the international dateline. Another 75,000 were estimated to occur east of the dateline. However, these estimates are, at best, very crude.

The take of walruses by the Soviet Union in 1976 was 1,271 animals, not including those killed or wounded but lost; the harvest cannot exceed 2,000, the present annual quota. The comparable 1976 retrieved harvest in Alaska, conducted almost exclusively for subsistence purposes by Alaska Natives, comprised 2,989 animals--slightly below the annual quota of 3,000 permitted under the return of management to the State in 1976. Revised walrus hunting regulations approved in May 1977, however, are intended to reduce future annual harvests to less than the maximum of 2,300 that the State intends to be its upper retrieved-take limit.

General biology. Only one group of pinnipeds, the elephant seals, is larger than the walrus. Adult males weigh an average of about 1,160 kilograms, and their mean standard length is about 316 centimeters. Adult females weigh an average of about 900 kilograms and have a mean standard length of about 270 centimeters. In a sample of newborn young, the maximum weight was 77 kilograms; the maximum length, 137 centimeters.

The first ovulation of females usually occurs between 5 and 8 years of age. Males become fertile at an age of 7 to 8 years but are not physically mature until they are at least 10 years old. The walrus is polygamous. The gestation period is about 15 months, including an approximately 3-month-long period of delayed implantation. The young are usually born in May during the northward spring migration. The females and young are very gregarious; males are gregarious at times other than the breeding season. Walruses often attain ages of 30 or more years.

Walruses are not buoyant and must rest on ice or land at fairly frequent intervals. By means of pharyngeal pouches that may be inflated, however, they are able to sleep while floating upright at sea for short periods of time.

Clams are the most important food. The stomach of one adult male contained about 23 kilograms of Mya truncata siphons and 16 kilograms of Clinocardium nuttalli feet. Other food includes echinoderms, annelids, coelenterates, sipunculids, echiurids, priapulids, arthropods, and tunicates. Occasionally, adult males may eat the flesh of other pinnipeds or cetaceans. The walrus diet appears to vary seasonally.

Internal parasites recorded from walruses include Trematoda (3 spp.), Cestoda (3 spp.), Nematoda (6 spp.), and Acanthocephala (4 spp.). All walruses are infested with external parasites. Small numbers of adult male walruses become carnivorous and feed on seal flesh. Probably it is this abnormal feeding behavior that accounts for trichinosis infection in from 1 to 10 percent of the more than 1,000 male walruses sampled from 4 Arctic regions. Incidence of uterine cysts and other disease conditions is low, as far as is known, and such diseases and abnormalities appear to be unimportant.

Ecological problems. Petroleum will undoubtedly be exploited from the Bering and Chukchi Seas and the Arctic Ocean. The effect of this activity on walruses or the resources they require is unknown. Their extensive benthic food resources are also subject to human exploitation, which could compete with the needs of the walruses or disturb benthic communities within which they feed. Also of concern is the harassment of walruses when they haul out in summer on the Walrus Island State Game Sanctuary (Togiak Bay), Bristol Bay. During the summer of 1976, the Alaska Department of Fish and Game stationed two of its personnel at Round Island.

Figure 7. Fitting a radio transmitter to left tusk of Pacific walrus for tracking studies, Round Island, Alaska, May 1978. Photo by James Faro, Alaska Department of Fish and Game.

Allocation problems. Siberian and Alaskan Natives kill 5,000 to 6,000 walruses annually for subsistence. None were taken during 1976 for display. Loss of walruses during hunting is about 40 to 50 percent.

Additional waste occurs in the utilization of the products of retrieved walruses. If ivory is the primary objective, actual use amounts to as little as 1 to 3 percent of full potential utilization. When meat and hides are used, utilization is as high as 90 percent of the carcasses. During recent years, ivory hunting has increased as a problem.

Regulations. In 1976, management of Pacific walruses was returned to the State of Alaska. Revised State hunting regulations, approved by the U.S. Fish and Wildlife Service in May 1977, established restrictive quotas by specific geographic areas within the most heavily hunted game management units.

Current research. The U.S. Fish and Wildlife Service has an ongoing research program on Pacific walruses. Investigators from the University of Alaska and Johns Hopkins University are currently studying walruses under grants funded by several agencies. The Alaska Department of Fish and Game maintains observers during the hunting seasons at coastal villages of Alaska to monitor the kill and to collect information on the population.

Atlantic walrus
(Odobenus rosmarus rosmarus)

Distribution and migration. Walruses are circumpolar in distribution. In the North Atlantic, small numbers are found along the east coast of Greenland, at Svalbard (Spitsbergen)-Franz Josef Land, and throughout the Barents and Kara Seas. A larger, geographically isolated population occurs in the eastern Canadian Arctic and western Greenland. Presently, walruses are rarely found along the coast of North America south of Labrador. Scattered groups are located in Hudson Strait and on the southeastern coast of Baffin Island. In Hudson Bay, the main population is found around Coats, Bencas, and Southampton Islands and in Fisher and Evans Straits. Another population, possibly very large, exists in northern Foxe Basin. Scattered concentrations occur in Lancaster and Jones Sounds and throughout the Canadian Archipelago as far west as Cornwallis Island. The Thule district of northwestern Greenland has large numbers of walruses year-round, and they occur at least seasonally along the western Greenland coast south to Sukkertoppen. Atlantic walruses in general seem to be less strongly migratory than the Pacific subspecies, with the possible exception of those along the coast of western Greenland.

Abundance and trends. Very few walruses remain in the eastern North Atlantic, where the total population numbered in at least the high tens of thousands in historic times. Less than 500 were counted at Novaya Zemlya in 1969-70, and this population continues to decline. The walrus may be nearing extinction around Franz Josef Land. The species was virtually exterminated in Svalbard; a group of about 10 animals has been seen regularly in recent years on northern Spitsbergen. A total population of about 200 walruses in northeastern Greenland may be stable.

Exploitation of walruses in Canada has diminished owing to cultural and technological changes within human communities. The northern Hudson Bay herds, estimated at approximately 3,000 in 1961, are probably stable. The population in Foxe Basin appears to be larger, although no reliable estimate is available. Little is known of the status of walruses in other areas of the eastern Canadian Arctic.

Although still hunted intensively by the Polar Eskimos, the walrus population in Greenland's Thule district remains substantial. South of Thule, however, the Greenland population appears to have declined considerably since the 1940's because of human encroachment and hunting. Western Greenland is probably the area most critically in need of assessment.

General biology. Most of what is known about the biology of the Atlantic walrus comes from studies at Southampton Island in the 1950's. Calves average 122 centimeters in length at birth and weigh about 67 kilograms. Adult females have an average length of about 260 centi-

meters and an average weight of about 570 kilograms, whereas males attain an average length of 305 centimeters and an average weight of about 910 kilograms. Seldom do the tusk lengths exceed 36 centimeters for males, 25 centimeters for females. Adult males may be distinguished from females by cutaneous tubercles of the head and neck, a broader muzzle, and more powerful muscles of the neck and shoulders.

The reproductive biology of the Atlantic walrus is not well understood. During most of the year, herds of adult males are spatially segregated from the herds of adult females with calves and immatures. Females apparently reach sexual maturity at an age of about 4 years and males at about 6 years, although neither may become reproductively active until several years later. Implantation is delayed for approximately 3 months, and gestation lasts about 1 year.

Ecological problems. Disturbances associated with economic development of the Soviet Arctic may be inhibiting the recovery, or even the maintenance, of the badly depleted walrus resource there. The same may be true in the mineral-rich Svalbard area. Exploration for and exploitation of oil and gas have been contemplated in northern Hudson Bay, Baffin Bay, and Lancaster Sound. The effect of these activities on walruses or their requisite resources is unknown. Reduction of the benthic fauna in areas inhabited by walruses may have a negative impact on their population. Human population growth throughout much of the Atlantic walrus' present and past range probably continues to limit its recovery, although the exact mechanisms by which various human activities affect walruses remain obscure.

Allocation problems. No commercial harvest of Atlantic walruses takes place today. Only subsistence hunting continues. Nothing is known about continued use of Atlantic walruses by Siberian Eskimos. Insignificant catches are made by aboriginal inhabitants of eastern and western Greenland (south of Thule). The total aboriginal harvest in Canada has approximately halved in recent years, owing primarily to the replacement of dog teams with motorized toboggans. Other factors may include a decreased reliance on "country food" and opportunities for employment other than subsistence hunting. Ivory acquisition appears to be the primary incentive for native hunting of walrus in Canada today. Only in the Thule district of Greenland (and possibly the Igloolik district in northern Foxe Basin, Canada) is walrus hunting a major element of native subsistence. Dog teams there still require large amounts of walrus meat and skin, and human consumption of meat and stomach contents is significant. Some trade in ivory and skin continued in Greenland until at least 1971.

Regulations. Canada established regulations in 1928 which limited the killing of walruses to Natives for food and clothing. These regulations have since been amended several times, but their main intent has not been changed. Walrus hunting regulations were established in Greenland in 1957. These limit hunting to Danish citizens who reside in Greenland.

From June 1 to January 1, all hunting for males in the West Ice is forbidden, and from April 1 to January 1, no females and calves may be taken in the same area. Hunting on land is forbidden in certain areas at certain times. Greenland National Park in northeastern Greenland encompasses most of the walrus' range on that coast and provides some protection for the animals.

In the Soviet Arctic, walrus hunting has been forbidden, with some exceptions, since 1949. Aboriginal hunting is still allowed but presumably under strict controls. The Soviet-Norwegian Sealing Agreement of 1958 forbade the hunting of walruses east of Cape Farewell by citizens of either country. Norway had instituted a Walrus Decree in 1952 which prohibited hunting by Norwegians. Nature reserves established by Norway in certain parts of Svalbard offer walruses some protection from human interference.

Current research. Except for those listed below, no field studies of the Atlantic walrus have been carried out since 1961. Modest, mainly opportunistic, monitoring programs are conducted by the Soviet and Norwegian Governments. The Grønlands Fiskeriundersogelser in Denmark collects catch statistics for all of Greenland. In addition, a field research program has been developed by Eric Bjorn and Theresa Christianson of the Zoological Museum, Copenhagen, Denmark. In Canada, the Fisheries and Marine Service reports estimated catches by settlement. In addition, Dr. Arthur Mansfield, Arctic Biological Station, is supervising behavioral and ecological studies of walruses, primarily in northern Hudson Bay. In 1977, Randall R. Reeves completed a report on the status, distribution, and natural history of the Atlantic walrus for the FWS Division of Wildlife Ecology Research's National Fish and Wildlife Laboratory.

West Indian manatee
(Trichechus manatus)

Distribution and migration. Trichechus manatus inhabits rivers, estuaries, and coastal areas of the tropical and subtropical regions of the New World Atlantic (fig. 9). It is commonly found from northern Florida in the United States to the northern coast of Brazil. Manatees are seasonally present in Georgia and rarely in South Carolina and North Carolina. Occasional stragglers have been reported as far north as Old Orchard, N.J. (lat. 40° N.) (fig. 9) and as far south as Espirito Santo, Brazil (lat. 20° S.).

Within the United States, the year-round range of T. manatus is largely confined to peninsular Florida, but distribution varies seasonally (fig. 10), and most manatees are grouped near sources of warm water during the winter. Along the west coast, they congregate in Crystal River and Homosassa River in Citrus County, in warm water effluents in Tampa Bay and the Alafia River in Hillsborough County, in the Caloosahatchie and Orange Rivers, and along the southwest coast from Naples to the Everglades

Figure 8. Service and University of Miami biologists capturing a spaghetti-tagged West Indian manatee for fitting with radio transmitter package for tracking studies, Merritt Island National Wildlife Refuge, Fla., April 1977. Photo by National Fish and Wildlife Laboratory.

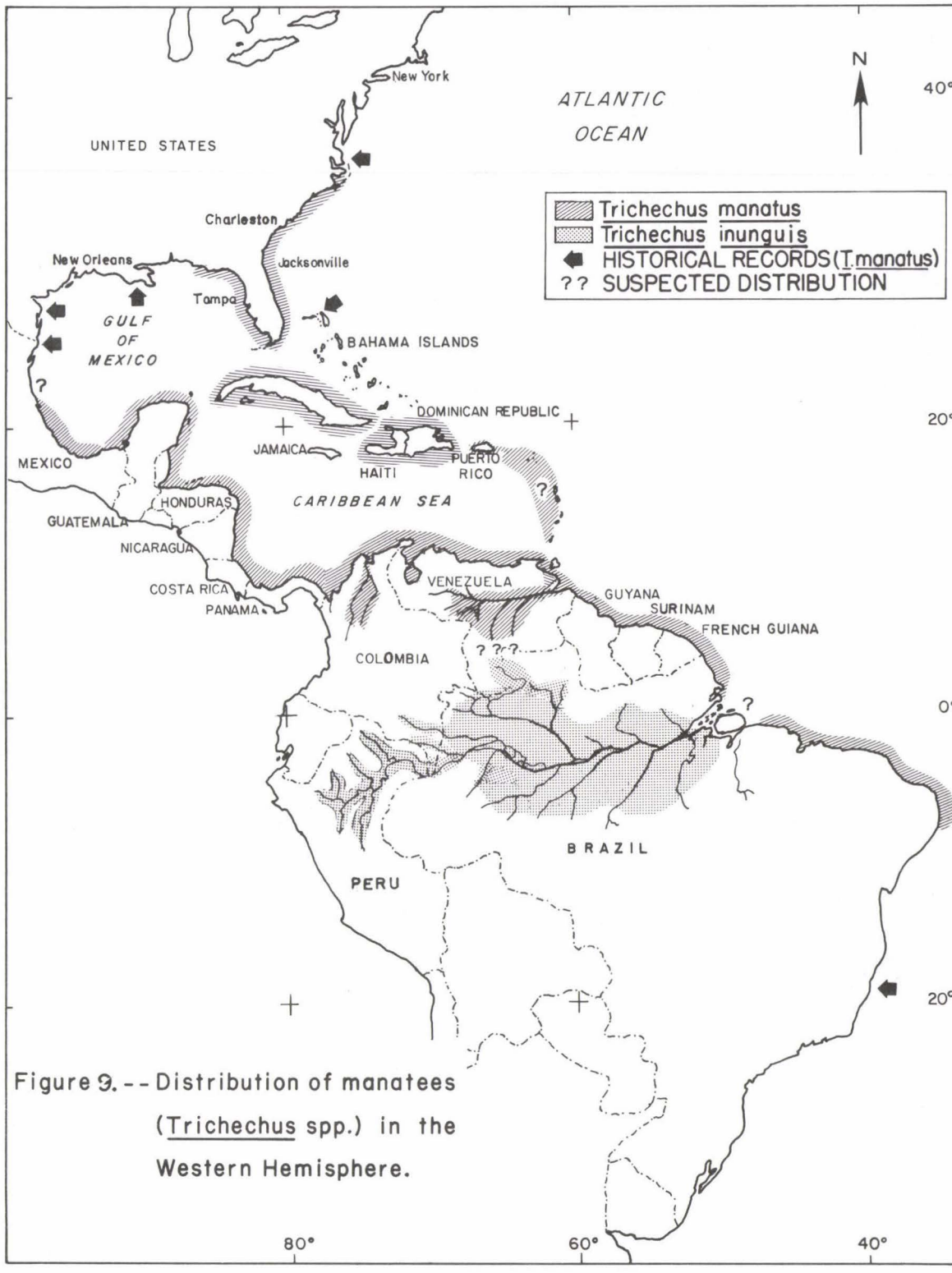

Figure 9. -- Distribution of manatees (Trichechus spp.) in the Western Hemisphere.

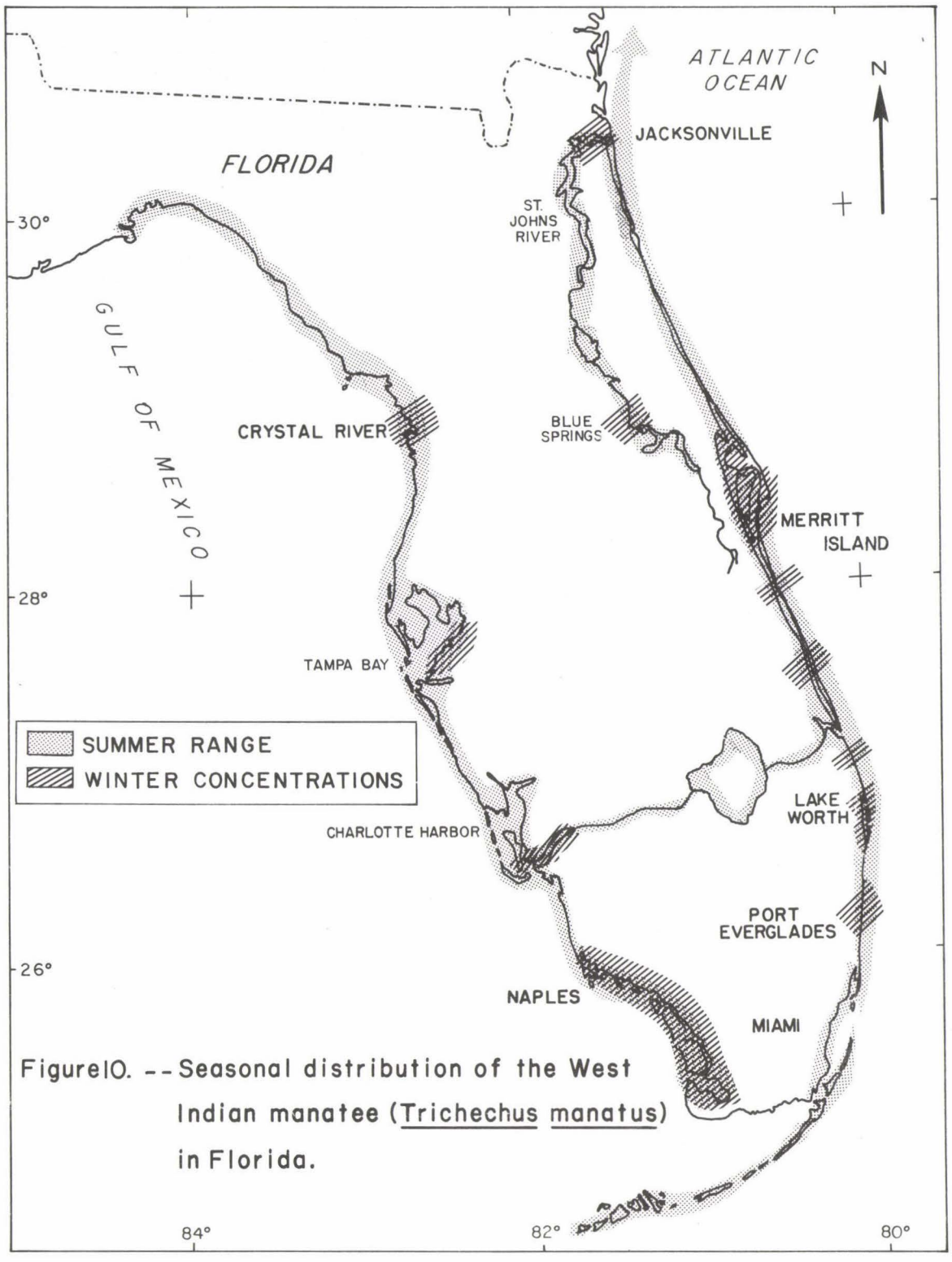

Figure10. --Seasonal distribution of the West Indian manatee (Trichechus manatus) in Florida.

National Park. On the east coast, large numbers of animals congregate near Titusville, in Lake Worth, and in Port Everglades; smaller groupings are found in the upper reaches and near the mouth of the St. Johns River and at several points along the coast. Congregation sizes fluctuate as members leave to forage, especially during warm periods.

The winter distribution of manatees appears to have expanded in recent years. Historical records suggest that manatees formerly wintered in southern Florida, below approximately latitude 27°52' N. (Sebastian Inlet). Today, more than 150 manatees winter on the east coast in Brevard County. Approximately 70 animals winter in Kings Bay, Citrus County, on the west coast.

As the water warms in spring, the congregations disperse along the Florida coast. Some animals move north into Georgia, while others are occasionally found along the Florida Panhandle--generally no farther west than the Aucilla and Port St. Joe Rivers, although single sightings from Pensacola, Fla., and Lake Pontchartrain, La., were reported in 1975-76. Offshore sightings along the Florida coast are sometimes reported.

In the western Gulf of Mexico, manatees occasionally range along the coast of Mexico and rarely into Texas. They are more commonly found south of Tamulipas or Veracruz, within the Bay of Campeche, and on both sides of the Yucatan Peninsula. Distribution appears to be continuous along the coast from Belize to Costa Rica, including Lake Isabella in Guatemala. Only isolated populations are thought to remain in Panama, presumably in Chiriqui Bay, the Changuinola River, Gatun Lake, the Sicaola River, and possibly the Cocle River. Manatees occur along the eastern coast of Colombia and in the Atrato, Leon, Suriqui, and Meta Rivers and the Magdalena River and its tributaries. T. manatus frequents the lower Orinoco drainage of Venezuela, including its tributaries, the Apure, Arauca, Payara, Capanaparo, and Claro Rivers, as well as Lake Maracaibo. In Guyana and Surinam, manatees occur primarily in the rivers of the coastal plain. In Brazil, they range along the coast as far south as Mangue Seca (lat. 12° S.), but they may not be continuous along the north coast, owing to unsuitable habitat.

Manatees are found throughout the Caribbean Sea, usually in small numbers in coastal regions near rivers. They occur on both coasts of Cuba and are seen most frequently at the Hatiguanico River in the Zapata Swamp, and in the Ensenada de la Bara. In Jamaica, they are most frequently found in the Black River area in the southwest and in the Portland Point area of the south-central coast. The distribution in the Dominican Republic seems to be concentrated around the Manzanillo-Miches area on the north coast and the Rio Ocoa-Oviedo area on the south coast. Nothing is known of them in Haiti, but at least some animals probably interchange with those from the Dominican Republic. In Puerto Rico, small groups are frequently sighted on the south coast near Guanica, Guayanilla, La Parguera, Jobos Bay, Roosevelt Roads Naval Station, the mouth of the Fajardo River on the east coast, and near Guanajibo on the west coast. One sighting was recently reported from Trinidad.

Abundance and trends. Aerial surveys of Florida coasts and rivers during the period 1974-78 and interview data indicate that the manatee population numbers at least 1,000 animals. A total of 738 manatees were counted in a concentrated aerial survey in early 1976, but the percentage of the population not observed is unknown. Documented mortality and limited reproductive potential make a decreasing population likely, but relative abundance cannot be determined because substantive previous studies are lacking.

In Mexico, interviews with local fishermen indicate that manatee numbers have drastically declined from past population levels. Sighting reports are rare, and the status of the population is uncertain. Populations in Belize seem to be decreased but stable. Manatees are reported to be fast decreasing in Guatemala but are still present at least in Lago Isabella. Their numbers in Honduras are low and probably decreasing, while estimates for Nicaragua range from a few score to several hundred. Few are believed to remain in Panama and Costa Rica.

Manatees are currently decreasing in many Colombian rivers and are extremely rare in the Santa Marta district and in the llanos of eastern Colombia. They have been extirpated from Taganga Bay, the Canal de Dique, and the Cienaga de Guajaro. In Venezuela, manatees are considered to be common in the lower Orinoco Basin. Several thousand manatees have been estimated to occur in Guyana, but populations are reportedly reduced in both Guyana and Surinam.

In the Caribbean, manatees are uncommon in most areas and are thought to be declining. Past hunting pressures in the Caribbean, Mexico, and Central and South America are apparently responsible for the present diminished manatee populations. However, laws forbidding their slaughter, and probably also the scarcity of the animals, have reduced hunting to primarily a subsistence level, and little commercial exploitation occurs any longer. In Mexico, for example, 23 major central markets were visited, and only 1 sale of manatee meat was reported within the last 10 years. As a result, remaining populations may have stabilized.

General biology. The West Indian manatee is large, fusiform, thick skinned, and almost hairless. The forelimbs are paddle-like with rudimentary nails, and the tail is horizontally flattened. Adults range in length from 2.5 to over 4.5 meters, and adult weights vary from 200 to 800 kilograms. Most adults are between 3 and 4 meters long and weigh less than 500 kilograms. Sexual dimorphism in size has not been documented.

Breeding occurs throughout the year. A cow in estrous usually copulates with several bulls. Mating has been observed in water about 2.5 meters deep as well as in shallows less than 1 meter deep. The gestation period is probably about 385 to 400 days, and parturition is thought to occur in secluded shallows. Successful breeding has occurred under captive

conditions only twice, but full documentation of the event is lacking. A cow usually bears only one calf at a time, but twins and a case of foster parenthood have been suggested. Newborn calves are about 1 meter long and weigh between 11 and 27 kilograms. Suckling from the axillary teats occurs underwater. Calves may begin grazing within weeks of birth, but nursing may continue for over 18 months. Breeding occurs every 3 to 5 years.

Manatees have been classified into the following age groups: calves, any small animals associating with a cow; juveniles, independent small animals not yet sexually mature; and adults, animals taking part in reproduction. Sexual maturity may not be attained until the animals are more than 6 to 8 years old. Manatee longevity in the wild is unknown, but a captive has been successfully maintained in Florida for over 30 years (as of May 1979).

Studies of social behavior indicate that the only prolonged association is between a cow and calf. Small groups consisting of an estrous female and her male consorts may remain together for several weeks. Groups of less than five animals are most commonly encountered, except during cold winter periods when larger groups are counted at warm water refugia in Florida.

T. manatus is thought to have no specific daily activity patterns. Adults may spend from 6 to 8 hours per day feeding. Manatees are mainly herbivorous, consuming a variety of food plants in the following order of preference: (1) submerged plants, (2) surface floating vegetation, and (3) emergents. Free-ranging and captive manatees have been reported to eat fish. Incidentally ingested insect larvae, amphipods, mollusks, shrimp, and other invertebrates probably provide protein for the manatee. Captive adults consume from 20 to 30 kilograms of vegetation each day. Manatees reportedly return to freshwater occasionally to drink.

Internal parasites of T. manatus include the trematodes Opisthotrema and Chiorchis and the nematode Plicatolabia. The copepod Harpacticus was also reported on the skin. Manatees in saltwater become covered with marine diatoms (Zygnema and Navicula) and barnacles (Chelonibia manati), while animals in freshwater develop a coat of algae (Lyngbya and Compsopogon).

There is little documentation of predation on the manatee by animals other than man, but attacks by alligators have been reported in Florida. Sharks have also been suggested as likely predators.

Ecological problems. In the United States, wounds inflicted by motorboats and barges are a major known cause of manatee mortality. Of 263 manatees salvaged from April 1974 through December 1978, 88 died from causes attributable to humans, and 51 of these were due to boat or barge

collisions. Flood-control structures, accidental netting, poaching, and miscellaneous involvement with human paraphernalia are additional causes of manatee mortality.

Manatees in northern Florida apparently cannot withstand cold winter temperatures, and warm water springs and industrial warm water discharges are the focus of winter congregations. Metabolic data suggest that manatees are strongly affected by water temperature below 20° C but not by air temperatures diminished temporarily to near freezing. Captives are known to feed erratically in 18° to 20° C water and to cease feeding in colder water. It has been suggested that powerplant effluents cannot provide adequately warm water temperatures during severe cold periods in northern areas. During severe winters (such as those of 1976-77 and 1977-78), greatly increased manatee mortality may result.

Programs to control weed growth may harm manatees. Some weeds, especially the submerged exotics Hydrilla sp. and water hyacinths Eichornia crassipes, impede boat traffic and are sprayed with herbicides, such as 2, 4, 5-T, silvex, and copper compounds, which then may be ingested by manatees. No direct effects of this or other herbicides have been documented. Oil spills from offshore drilling may also affect manatees' food supplies. Dredging (and motorboats) may also detrimentally affect manatees by increasing water turbidity until submergent plants can no longer survive.

Blue Spring State Park (a winter congregating site) is designated a manatee sanctuary by the Florida Department of Natural Resources. As many as 27 manatees have taken refuge in this spring during cold periods. Manatees also inhabit the Everglades National Park and several national wildlife refuges. Manatees are especially abundant around the Merritt Island National Wildlife Refuge. Foreign sanctuaries include Colombia's Parque Nacional Isla de Salamanca and Costa Rica's Tortuguero National Park. Manatee occurrence in other foreign reserves or sanctuaries is unknown.

Allocation problems. Manatees have long been hunted for their meat, hides, oil, and ivory. Protective legislation is now nearly complete. The meat is still sold occasionally in local markets of Brazil, Colombia, and Venezuela, but kills are usually the result of fortuitous encounters by fishermen. T. manatus has been used in small-scale aquatic weed clearance projects in Florida, Guyana, Mexico, and Panama. The manatee has also been suggested as a potential meat resource, to be farmed like cattle. However, current decimated populations and the species' low reproductive rate make these projects unrealistic.

Regulations. Protective legislation for the manatee now exists in the following countries or commonwealths: Brazil, British Honduras, Colombia, Costa Rica, Cuba, the Dominican Republic, Guyana, Haiti, Jamaica, Panama, Puerto Rico, Trinidad, the United States, and Venezuela.

In July 1978, the Florida Manatee Sanctuary Act took effect. This State legislation declares the entire State of Florida a "refuge and sanctuary

Figure 11. Service and University of Miami biologists fitting radio transmitter to tail stock of West Indian manatee, Merritt Island National Wildlife Refuge, Fla., April 1977. Photo by National Fish and Wildlife Laboratory.

for the manatee." The act also provides for the regulation of boat speeds in 13 manatee winter aggregation areas between November 15 of one year and March 31 of the following year.

Current research. In 1974, the FWS Division of Wildlife Ecology Research's National Fish and Wildlife Laboratory (NFWL) initiated a research program on the ecology, behavior, and physiology of T. manatus in Florida. In addition to the three NFWL staff members assigned to its Sirenia Project research efforts, the Service has contracts and cooperative agreements with individuals and other institutions to conduct further manatee research. In cooperation with overseas scientists, NFWL researchers have also conducted preliminary studies on manatees in Brazil, Colombia, Honduras, Mexico, Puerto Rico, and Surinam. In March 1978, the NFWL cosponsored with the Florida Audubon Society, Florida Department of Natural Resources, and Sea World of Florida a 3-day West Indian manatee workshop in Orlando, Fla.

Dr. E. Mondolfi of Venezuela is directing a program to study T. manatus in his country, and Dr. P. van Bree of Amsterdam is supervising a taxonomic study comparing T. manatus and T. senegalensis. Mr. T. Johansen is studying manatees in Lake Isabella in Guatemala. Mr. D. and Ms. C. Belitsky have conducted aerial surveys of manatees in the Dominican Republic and Puerto Rico.

Amazonian manatee
(Trichechus inunguis)

Distribution and migration. Amazonian manatees are strictly fluviatile, apparently being confined to the Amazon Basin and possibly the Orinoco drainage (fig. 9). In Brazil, they occur in the Amazon River and the following tributaries: Rio Tocantins, Rio Xingu, the Tapajos, the Nhamunca, Rio Madeira, and Rio Negro. They have also been reported in Rio Branco, which is almost continuous with the Essequibo and Rupununni Rivers of Guyana during flooding, thus allowing the animals access to these rivers. T. inunguis is also thought to inhabit the upper Orinoco and the Cano Casiquiare of Venezuela, but records are lacking. In Colombia, Amazonian manatees may be found in the Amazon and the Putumayo River (west to the Araracuara rapids); they may also frequent the Apaporis River. Peruvian rivers supporting manatees are: Rio Napo, Rio Tigre, Rio Maranon (as far as its confluence with Rio Pastaza), Rio Samiria, and Rio Pacaya. These animals also inhabit the Ucayali and Huallaga River drainages but are absent from both the Madre de Dios and the Purus systems. No information is available on migration of this species.

Abundance and trends. Amazonian manatees were formerly abundant in the Brazilian Amazon. Thousands of skins were brought yearly to Manaus for trade in the 1930's and 1940's. T. inunguis is consequently less abundant today in most of the Amazon and its tributaries. It is, however, still fairly common in some lakes on the lower Tapajos and in the Nhamunca River. In general, it is regarded as rare in Colombia. This species is nearer extinction in Peru than is any other mammal, although modest numbers do remain in Rio Samiria and Rio Pacaya. All reports indicate a dramatic decline in numbers of Amazonian manatees throughout their range. Population estimates are not available, but extinction has been predicted within the next few decades if local hunting pressures continue.

General biology. T. inunguis is a large, fusiform, and nearly hairless marine mammal with paddlelike flippers and a spatulate tail. It is distinct from other manatee species (T. manatus and T. senegalensis) in both appearance and habitat. Characteristically, it is more slender and has elongated flippers lacking nails, and it is marked by a unique white breast patch. This species is the only entirely fluviatile manatee. Adults may reach lengths of 2.8 meters and estimated weights between 125 and 250 kilograms. Breeding apparently occurs throughout the year. The gestation period is thought to be about 1 year, and usually a cow gives birth to only one calf at a time. Newborn calves are less than 1 meter long and weigh less the 20 kilograms. Further information on reproduction, ontogenetic variation, and population structure is lacking. Longevity in nature is unknown, but a captive pair survived 12-1/2 years before they died.

Amazonian manatees feed upon varied aquatic vegetation, including Stratiotes, Potamogeton, Vallisneria, Ceratophyllum, Ulva, Myriophyllum, and Zostera. Daily consumption of food plants has not been measured under natural conditions, but captive adults generally require 9 to 15 kilograms of lettuce and vegetables daily. Natural predation on T. inunguis is not documented, but jaguars, sharks, piranhas, and caimans have been suggested to be likely predators. The trematode, Chiorchis fabaceus, occurring in the large intestine, is the only internal parasite reported for this species. Bronchial disorders, pneumonia, and skin problems have been noted in captives, and one captive developed osteomyelitis as a result of a harpoon wound.

Allocation problems. Many Indian tribes of Amazonia have hunted manatees in the past for both meat and the hides which were used to make shields. Animals were captured with harpoons and nets, but the final killing was done by driving wooden plugs into their nostrils, causing suffocation. In the 1930's and 1940's, the Amazonian manatee was commercially exploited for the skins, which were shipped to Portugal and Rio de Janeiro where they were used primarily to make machine belting and water hoses. A meat preparation called "mixira," consisting of meat boiled in its own fat, was canned and also shipped abroad. Thousands of manatees were slaughtered yearly. Protective legislation has since been enacted, and the present rate of exploitation is reportedly reduced. However, poaching continues at a reduced rate, and manatee meat is still occasionally available in Colombia and Brazil.

Regulations. T. inunguis is totally protected in Brazil (1968), Colombia (1969), Guyana (1961), Peru (1973), and Venezuela (1970).

Current research. Robin C. Best is continuing his studies on the species at the Instituto Nacional de Pesquisas da Amazonia, Manaus, Brazil. This study includes data on the species' growth, anatomy, distribution, and natural history.

West African manatee
(Trichechus senegalensis)

Distribution and migration. The West African manatee occurs in coastal waters and adjacent rivers of West Africa--from the mouth of the Senegal River (lat. 16° N.) to the mouth of the Cuanza River in Angola (fig. 12). Animals of this species have been reported from the Faleme, Gambia, and Casamance Rivers of Senegal and Gambia and from the coasts of Guinea. Other rivers known to support manatees are the Sierra Leone, the Missunado, the St. Paul's, and the Cavalla. In Ghana, the species is now apparently restricted to Lake Volta and the upper reaches of the Volta River. Manatees have been taken at Benin and Lagos, Nigeria, occur in the Doro River Forest Reserve, and are numerous in most of the larger rivers of southern Nigeria. They occur in the Niger River and are common as far upriver as Idah, on the western border; however, they travel even farther upriver and have been noted in Segou, Mali, about 320 kilometers southwest of Timbuktu. Manatees also ascend the Benue River, a large tributary of the Niger; they have been reported in this waterway as far east as Numan (lat. 9° N., long. 12° W.). Manatees are not thought to occur in Lake Chad, although specimens have been collected from its principal tributaries, the Baningi, the Bahr Keeta, and the River Shari. In Cameroon, they are found within the Korup and Campo Reserves and have been reported from the Mungo and Wouri Rivers; they also probably inhabit the Campo River in southern Cameroon. Specimens have been taken from the Rio Muni, Gabon, and Ogooue Rivers and may also be found in the Loeme River of Congo Brazzaville. In Zaire, T. senegalensis occurs in the lower Congo River and also in the upper drainage of the Uele River, east to Kibali. The Loge, Dnade, Bengo, and Cuanza Rivers of Angola all reportedly contain manatees. No data are available on migrational movements.

Abundance and trends. No population estimates are available for this species. The West African manatee was reported to be rare in the Senegal, Faleme, and Casamance Rivers of Senegal as early as 1900. Recent reports of manatee abundance in Senegal, Guinea, and Portugese Guinea are lacking. Manatees remain common enough in the Sierra Leone River estuaries today to be trapped for food, but no information is available on their current status along the coast from Liberia to Nigeria. Manatees have been extirpated from the Mekrou River of Benin and the portion of the Niger River on the Niger-Benin border, although they are thought to be still numerous in most of the larger rivers of southern Nigeria. Populations seem to be stable in the lower Niger, the Benue River, and the Anambra system of creeks, but manatees are rare in the Izichi River of Nigeria. T. senegalensis has apparently been extirpated in Lake Chad and is classified as rare in the Cameroons. The lower reaches of the Congo River reportedly support numerous animals, but populations have diminished in the upper rivers. In general, the manatee population of Zaire is much reduced. T. senegalensis is classified as a vulnerable species, but little information is available on the recent distribution or abundance of this animal.

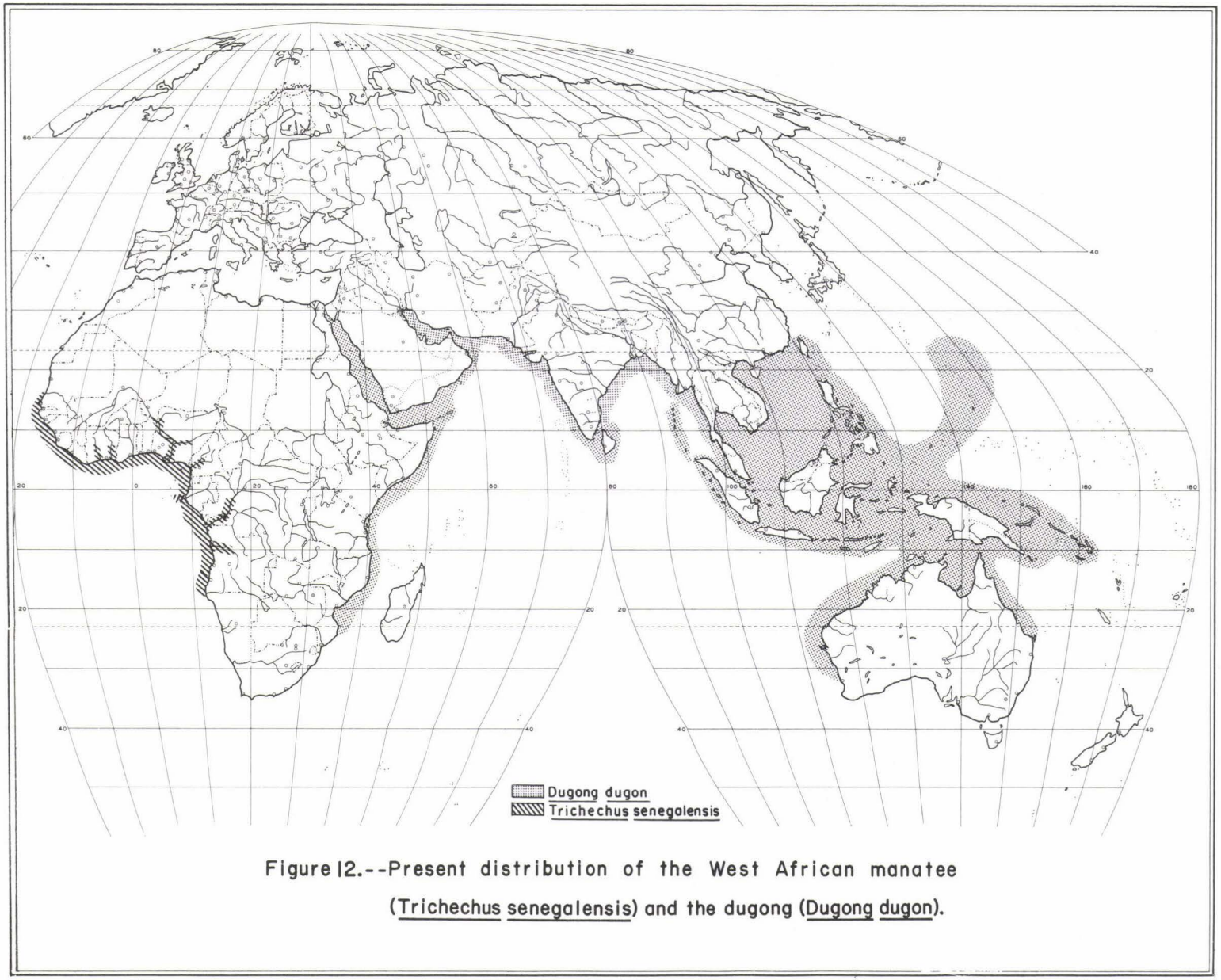

Figure 12.--Present distribution of the West African manatee (Trichechus senegalensis) and the dugong (Dugong dugon).

General biology. Externally, this manatee is indistinguishable from the West Indian manatee. It too is large, fusiform, and nearly hairless and has paddlelike flippers and a spatulate tail. Average adults measure from 2.5 to 3.4 meters in length and weigh from 400 to 500 kilograms. It has been hypothesized that breeding occurs during the late dry season in weedy swamps and lagoons, but documentation is lacking. The gestation period is unknown but is probably about 1 year, and a cow usually gives birth to a single calf. Newborn calves are approximately 1 meter long, and they are believed to remain with the parent cow for a long time. No further information is available on reproductive or population biology of this species.

West African manatees favor weedy swamps and mirigots. They are believed to be active throughout the day but feed mostly at night. Their diet includes the aquatic vascular plants Cymodocea nodosa, Polygonum sp., and Eichornia crassipes, but they also reportedly feed on leaves of the mangrove Rhizophora, a terrestrial plant whose leaves often hang over water. A 1.85-meter-long captive male consumed 12 kilograms of vegetables daily. When 2.4 meters long, he regularly ate 17 to 18 kilograms of vegetables, Elodea, and legumes daily. The only information available on the social behavior of T. senegalensis is that groups of four animals, including half-grown calves, have been observed.

Chiorchis fabaceus, a trematode found in the large intestine, is the only internal parasite reported for the West African manatee. No diseases of this species have been reported from the wild, but one captive died of acute enteritis. There is no evidence of predation on T. senegalensis by species other than man.

Ecological problems. Propellers and keels of boats striking submerged manatees may inflict mortal wounds. While there is no evidence that this is as real a problem in West Africa as it is in Florida, the Ijaw fishermen of the Anambra system of creeks in Nigeria considered manatees a nuisance to their boat traffic. In 1932, they began trapping and killing manatees, and they exterminated the local population within 3 years. Killing of manatees for food reportedly reduced this species in rivers in Ghana after the water became clearer following the construction of dams. These dams are also believed to have isolated populations and may disrupt normal movement patterns. Manatees inhabit the recently formed Lake Volta in Ghana and Lake Kainje in Nigeria, which are currently being overgrown with aquatic weeds. Use of herbicides on the weeds which are consumed by the manatees presents a potential threat to the animals. Pollution of waters in areas of human development would be expected to adversely affect the food sources of manatees.

Allocation problems. The West African manatee has long been hunted throughout its range, largely for its meat. Hunting is done at night with nets, harpoons, and guns, and such hunting has been a regular occupation in the lower Congo, Angola, and in northern Nigeria. No esti-

mates of current take are available. Manatees are also accidentally caught and die in shark nets, which are set along many coastal areas of West Africa. T. senegalensis has been considered to be a potential solution to the problem of aquatic weed control in manmade lakes and river systems. Experiments with the West Indian manatee indicate that that species can successfully control weeds under certain specialized circumstances and that manatees plus alternative mechanical weed removers may provide the best non-chemical means of control.

Regulations. The West African manatee is currently protected in Angola, Benin, Cameroon, Congo Brazzaville, Gabon, Ghana, Guinea, Ivory Coast, Liberia, Nigeria, Senegal, Sierra Leone, Togo, and Zaire. The species has also been proposed for threatened status under the U.S. Endangered Species Act.

Current research. No survey programs are currently underway to determine the status and distribution of this species, but the U.S. Fish and Wildlife Service's Division of Wildlife Ecology Research considers this to be a critical area for research.

Dugong
(Dugong dugon)

Distribution and migration. Dugongs occur in tropical and subtropical Indo-Pacific waters (fig. 12). They are totally marine and are usually found in nearshore coastal waters from 3.7 to 5.5 meters (2 to 3 fathoms) deep. Along the east coast of Africa, they range from the Red Sea coast of Egypt south to Delagoa Bay (lat. 26° S.), Mozambique, but this distribution is discontinuous owing to local extirpation in certain areas. Dugongs have been reported from the Persian Gulf, and they also range along the west coast of India, south of the Gulf of Kutch. They occur in Sri Lankan waters and are present in the Andaman Islands, the Mergui Archipelago, Burma, Malaysia, the Moluccas, and Sumatra. They may still be found in the Ryukyu Archipelago, and specimens have been taken in Taiwan and Hong Kong. The present range extends south and east to include Guam, the Palau Islands (Caroline Islands), New Britain, Papua New Guinea, the Solomons, New Caledonia, and the New Hebrides. In Australia, dugongs occur all along the northern coast from Perth (lat. 32° S.) on the west coast to Brisbane in the east. They are absent from the Marshall, Gilbert, Ellice, and Fiji Islands.

Long-distance migrations of this species are unknown, but local, offshore movements are apparent. These may be correlated with the changing monsoon seasons and possibly with resulting shifts in abundance of food sources. During the season of rough seas and extremely strong winds, the animals move to shore, apparently seeking shelter. Such movements have been reported in east Africa, India, and the Philippines. Similar migrations have not been noted in Australia.

Abundance and trends. Populations are thought to be much reduced and still declining throughout much of the range, except in Australia and Papua New Guinea. No numerical estimates of dugongs are available, except for those in northeastern Australia where an estimated 1,000 to 2,000 animals dwell along the Queensland coast.

Dugongs are more abundant in Kenya and the Somali Republic than elsewhere along the coast of Africa; in Kenya, they presently occur only in Lamu Park. They are now extremely rare in the Red Sea and the Gulf of Aqaba. They were once abundant enough in the Gulf of Mannar (between Sri Lanka and India) to support a large commercial dugong fishery. The only remaining segments of this population are restricted to the region near the Mannar Peninsula of Sri Lanka, from Jaffna to Puttalam. Numbers have declined along the Sarawak coast of Malaysia, and few dugongs can be found today in the Ryukyu Archipelago. The only stable populations occur along the northern Australia coast--Shark Bay, Broome, the Gulf of Carpentaria, and the northern coast of Queensland--and along the coast of Papua New Guinea. These stocks appear to be maintaining themselves.

General biology. A dugong is a large fusiform marine mammal with flipper-like forelimbs and a broadly notched, horizontal tail fluke. Adults range in length from 2.4 to 2.7 meters, in weight from 230 to 360 kilograms. The thick, nearly hairless skin is deep slate gray to brown and is frequently marked with numerous scars and scratches. Dugongs were highly social in the past, forming large herds of several hundred animals. Today, groups usually include no more than 6 animals, although groups of up to 50 animals are still seen along the coast of Australia. Breeding apparently occurs throughout the year. The gestation period is thought to be about 1 year, and a cow usually bears only one calf at a time; twins have been reported rarely. Newborn calves are about 1.1 meter long. Calves begin grazing within 3 months of birth but continue to nurse for over 1 year, when they may have grown to a length of 1.8 meters. Animals reach sexual maturity at an approximate length of up to 2.4 meters, which corresponds to an estimated age of 5 to 10 years. Sexual dimorphism in size of adults is not evident. Longevity of the dugong in the wild is unknown, but analysis of tooth growth layers suggests a maximum of 30 to 60 years, depending on whether growth rings are annual or biannual. Two captives were successfully maintained for 10 years in India.

Dugongs are largely herbivorous and feed primarily on marine sea grasses of the families Potamogetonaceae and Hydrocharitaceae; these particular grasses occur in upper subtidal and lower intertidal waters with a year-round temperature range between 21° C and 28° C. Diplanthera and Cymodocea are most heavily utilized, but the brown algae, Sargassum, may also be consumed in significant amounts when sea grasses are locally scarce. Dugongs reportedly prefer to feed at night or with the rising tide.

There are few observations of predation upon the dugong by animals other than man. Fishermen have claimed that the shark is a predator, but of the more than 100 dugongs netted and drowned in Queensland, none showed any sign of attack by sharks or other predators. Large saltwater crocodiles are known to eat dugongs occasionally, but the extent of this predation is unknown.

Internal parasites include 10 species of trematodes and 2 species of nematodes. Barnacles and green filamentous algae have been observed on dugongs but do not appear to be harmful. No diseases have been reported.

Allocation problems. Man is the major threat to the dugong's existence. Boat traffic in offshore areas may inflict mortal wounds. Increased marine fishery activities in the India-Sri Lanka and Kenya areas have resulted in accidental dugong nettings, which have drowned substantial numbers of animals. Dynamiting for fish presumably also adversely affects dugongs. In Queensland, Australia, a shark-netting program has resulted in large dugong mortality; similar netting programs exist in Africa.

Dugongs have been hunted throughout their range. Their meat is similar to veal or pork and "keeps" for long periods of time. Adults of average size yield from 19 to 30 liters of oil similar to cod liver oil, and the hide makes excellent leather, which is especially suitable for sandalmaking. Tusks and bones are used as ivory, and several body parts were once thought to have medicinal or aphrodisiac properties. Today, hunting pressures are much reduced, owing partly to the decline of dugongs. In spite of legislative protection, however, poaching continues. In Australia, the aborigines and Torres Islanders may still legally hunt the animals. One village of 250 people caught an average of about 70 animals per year during the early 1960's. In Papua New Guinea, at least one animal is killed each week for local consumption along the southwestern coast.

Regulations. The dugong is totally protected in Anglo-Egyptian Sudan, Egypt, Ethiopia, India, Japan, Kenya, Madagascar, Mozambique, Natal, New Caledonia, the Philippines, Sabah, Sarawak, Somalia, South Africa, Sri Lanka, Taiwan, and Tanzania; in Australia and Papua New Guinea, only aborigines and natives may hunt the dugong for their own local consumption and use. Although protection is nearly complete, effective enforcement is virtually impossible in most areas.

Current research. George Heinshon and his associates at James Cook University, Townsville, are continuing their study of dugongs in Queensland, Australia. Animals accidentally drowned in shark nets provide population and reproduction data, as well as information on food habits. Studies of nutrition, general ecology and behavior, and histology are also being conducted. Brydget Hudson of the Wildlife Division, Department of Natural Resources, Papau New Guinea, is continuing her study of dugongs throughout the waters of that area. In 1977, the FWS Division of Wildlife Ecology Research's National Fish and Wildlife Laboratory started surveys on the dugongs in the waters around Palau, Trust Territory of the Pacific Islands.

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Appendix A

Final revised rule on Service review

of State laws and regulations

Federal Register, volume 43, number 191, pages 45370-45374,

Monday, October 2, 1978 (43 F.R. 45370-45374)

[4310-55]

PART 18—MARINE MAMMALS

State Laws and Regulations

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: Regulations are issued which revise subpart F of part 18 of title 50, Code of Federal Regulations. The regulations implement section 109(a) of the Marine Mammal Protection Act which provides for the adoption and enforcement of State laws relating to the protection and taking of marine mammals. The regulations establish procedures for States to follow in requesting review and approval of their marine mammal laws. The regulations also set forth procedures, standards, and criteria that the Service will use in reviewing, approving, monitoring, and superseding the State provisions.

EFFECTIVE DATE: November 1, 1978.

FOR FURTHER INFORMATION CONTACT:

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SUPPLEMENTARY INFORMATION: The Marine Mammal Protection Act of 1972 provides that subject to certain exceptions, a State may not adopt or enforce any law or regulation relating to the taking of marine mammals within its jurisdiction. 16 U.S.C. 1379(a)(1). In the case of *Fouke Co.* v. *Mandel*, 386 F. Supp. 1341 (D. Md. 1974), the Act was construed to preempt State laws and regulations relating to importation as well as taking.

However, the Act also provides that a State may adopt and enforce laws and regulations relating to the protection or taking of marine mammal species or population stocks within its jurisdiction if the Secretary reviews such laws and regulations and determines them to be consistent with applicable provisions of the Act and regulations issued thereunder. 16 U.S.C. 1379(a)(2). If the Secretary approves State laws and regulations as being so consistent, they take effect and certain provisions of the Act no longer apply. Id. After approval, the Secretary must, however, continue to monitor and review the State laws, and if they cease to comply with the purposes and policies of the Act, he must supersede them to the extent deemed necessary after notice and opportunity for a hearing. Id. at section 1373(a)(3). The Secretary's authority concerning these functions has been delegated to

the Director of the Service. 242 Int. Dep't. Man. 1-2.

In a notice of proposed rulemaking dated April 9, 1976, the Service published proposed regulations to implement the above provisions of the Act dealing with State laws and regulations (41 FR 15166). The proposed regulations dealt both with State laws and regulations implementing a waiver of the Act's moratorium on taking or importation, see 16 U.S.C. 1371(a), and with State laws and regulations which would not implement a waiver of the moratorium (41 FR 15169-15171). For each type of provision, the proposed regulations set forth procedures for a State to follow in requesting a review of its laws and regulations, criteria the Service would use in approving or disapproving the State provisions, procedures for continuous monitoring and review after approval, and procedures for dealing with changes in approved laws and regulations. Id.

For those laws and regulations implementing a waiver, the proposal further provided for a notice to be published in the FEDERAL REGISTER which would announce approval of the State provisions, summarize the State management program, and set forth the extent of the waiver. For laws and regulations implementing a waiver, the proposal also published enforcement standards for State officials, required the Service to be notified whenever takings under a waiver reached 90 percent of the waiver's numerical quota, and set forth procedures for superseding State provisions found not to comply with the Act's purposes and policies. Id.

The Service received comments on the proposed regulations from a number of environmental and animal welfare organizations.

Three of the organizations commented that to simplify enforcement of the Marine Mammal Act, the Service's regulations should be identical to those of the National Marine Fisheries Service. In all substantive respects, the final regulations published herein are the same as the regulations on State laws published by the National Marine Fisheries Service on August 31, 1976, 50 CFR Part 216, Subpart H; 41 FR 36659.

The same three organizations also indicated that the regulations should define the term "State regulation" and that a State regulation approved by the Service must have the force and effect of law and must not be a "mere policy statement changeable at will" by a State regulatory agency. Section 18.51 of the final regulations adopts as the definition of "State regulation" a definition similar to that set forth in the Federal Administrative Procedure Act, 5 U.S.C. 551(4), for the term "rule."

The above three organizations further indicated that the regulations should set forth the components of a "modern scientific resource management program" as that term is used in 50 CFR 18.55(a). As finally adopted herein, section 18.55(a) specifies that a modern scientific resource management program includes, but is not limited to, research, census, law enforcement, habitat acquisition and improvement, and if appropriate, the periodic or total protection of the species or population stocks which would be affected by the State's marine mammal provisions.

All five of the commenting organizations suggested changes in the procedures for reviewing and approving State marine mammal laws. It was stated that public participation in the review and approval process should not be limited to residents of the State concerned. It was also urged that there should be an opportunity for public comment and for a hearing on the State laws and regulations and on any changes made therein. In addition, it was suggested that determinations of either approval or disapproval of the State provisions should be open to public comment after publication in the FEDERAL REGISTER. Finally, three of the organizations suggested that provision be made for an appeal to the Secretary from any determination of approval or disapproval made by the Director.

To ensure meaningful public participation in the review and approval process, by both residents and nonresidents of the State concerned, § 18.53(c) provides for publication of a notice in the FEDERAL REGISTER setting forth information concerning public inspection and copies of the State laws and regulations. The notice will also provide for the submission of written data, views, comments, or requests for an informal public hearing on the State provisions.

In addition, § 18.53(e) provides that the Director's decision to approve or disapprove the State provisions will be published in the FEDERAL REGISTER. However, the regulations do not provide for any public comment or appeal to the Secretary on the Director's approval or disapproval. Since the Director's decision on any accompanying waiver or Federal regulations would be final, see 50 CFR 18.91(a), his decision to approve or disapprove the State laws and regulations should also be final.

With regard to changes and other aspects of approved State laws and regulations, paragraphs (d) through (h) of § 18.56 provide procedures for public participation which are similar to the procedures outlined above for initial sets of State provisions.

Two of the commenting organizations indicated that the regulations should set forth the role that the Federal Government will play after a State's marine mammal provisions have been approved. Lastly, three of the organizations commented that a State's notice to the Service that takings under a waiver have reached 90 percent of the allowed quota should be published in the FEDERAL REGISTER.

Concerning the general role of the Federal Government after approval of State laws, §§ 18.53(f) and 18.56 of the regulations provide that the Service will continuously monitor and review the State provisions and that any substantial changes in such provisions, other than emergency closings of seasons, must be approved by the Service before they take effect. Section 18.56 further provides for the State provisions to be superseded and the Act to be reinstated if such provisions are found not to be in compliance with the Act or applicable Federal regulations. Also, § 18.57 now provides that a State's notice concerning approach of the waiver quota will be published in the FEDERAL REGISTER.

In addition to changes resulting from public comments, the final regulations make several other changes in the proposed regulations. Specifically, the final regulations make applicable to any State laws submitted for approval a number of provisions which the proposal would have applied only to State laws implementing a waiver. These provisions include enforcement guidelines in § 18.58, procedures in § 18.56 relating to monitoring and review of approved State laws and possible reinstatement of the Act, and publication in the FEDERAL REGISTER under § 18.53(e) of the Director's decisions to approve or disapprove State laws.

The final regulations also clarify the scope provisions of § 18.52, delete as unnecessary proposed § 18.53(a), and delete proposed § 18.53(b) in order to eliminate a possible conflict with proposed subpart H of part 18 on the issue of scientific research and public display permits.

Lastly, aside from the revision of subpart F, the regulations published herein make two additional changes in 50 CFR Part 18. First, § 18.4 is deleted since its provisions are now included in the new § 18.53(a). Also, the introductory text of § 18.11 is amended by including as an exception to the general taking prohibitions the waiver provisions of subpart H of part 18.

These regulations are issued under the Marine Mammal Protection Act of 1972, 16 U.S.C. 1361-1407. They were prepared by David Fisher and Ronald Swan, Office of the Solicitor, Department of the Interior.

NOTE.—The Service has determined that issuance of these regulations is not a major Federal action which would significantly affect the quality of the human environment within the meaning of section 102(2)(C) of the National Environmental Policy Act of 1969. Therefore, an environmental impact statement is not required.

Accordingly, part 18 of subchapter B of chapter I, Title 50, Code of Federal Regulations, is amended as follows:

§ 18.4 [Deleted]

1. Section 18.4 is deleted.

2. The introductory text of § 18.11 is amended to read as follows:

§ 18.11 Prohibited taking.

Except as otherwise provided in subpart C, D, or H of this part 18, it is unlawful for:

* * * * *

3. Subpart F of the table of sections for part 18 is revised to read as follows:

Subpart F—State Laws and Regulations

4. Subpart F is revised to read as follows:

Subpart F—State Laws and Regulations

§ 18.51 Purpose of regulations.

The regulations contained in this subpart implement section 109(a) of the Act which provides for the adoption and enforcement of State laws and regulations relating to the protection and taking of marine mammals. As used in this subpart, the term "State regulation" means the whole or a part of a State agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy or describing the organization, procedure, or practice requirements of a State agency and which is duly promulgated in accordance with established procedure.

§ 18.52 Scope of regulations.

(a) Except for §§ 18.54, 18.55, 18.57, and 18.59, which apply only to State laws and regulations that implement a waiver of the moratorium on taking or importation established by section 101 of the Act, the regulations of this subpart apply both to State provisions implementing a waiver of the moratorium and to State provisions not implementing a waiver.

(b) Nothing in this subpart shall prevent (1) the taking of a marine mammal by a State or local government official in accordance with § 18.22 of this part, or (2) the adoption or enforcement of any State law or regulation relating to any marine mammal taken before December 21, 1972.

§ 18.53 Review and approval of State laws and regulations—general.

(a) Any State may obtain a review and consistency determination of its proposed or existing laws and regulations from the Director by submitting a written request to that effect to the Director, U.S. Fish and Wildlife Service, accompanied by the following documents unless otherwise specified by the Director:

(1) A complete set of laws and regulations to be reviewed, certified as complete, true, and correct by the appropriate State official;

(2) A scientific description by species and population stock of the marine mammals to be subjected to such laws and regulations;

(3) A description of the organization, staffing, and funding for the administration and enforcement of the laws and regulations to be reviewed;

(4) A description, where such laws and regulations provide for discretionary authority on the part of State officials to issue permits, of the procedures to be used in granting or withholding such permits and otherwise enforcing such laws; and

(5) Such other materials and information as the Director may request or which the State may deem necessary or advisable to demonstrate the compatibility of such laws and regulations with the policy and purposes of the Act and the rules and regulations issued thereunder.

(b) To assist States in preparing laws and regulations relating to marine mammals, the Director will also, at the written request of any State, make a preliminary review of any proposed laws or regulations. This review will be advisory in nature and shall not be binding upon the Director. Notwithstanding preliminary review by the Director, once any proposed laws and regulations have been prepared in final form, they shall be subject to final review and approval under paragraphs (c) through (g) of this section. To be considered for preliminary review, a State shall submit the same documents required in paragraph (a) of this section, unless specified otherwise by the Director.

(c) Upon receipt of a request submitted in accordance with paragraph (a) of this section, the Director will publish in the FEDERAL REGISTER a notice stating that the State laws and regulations under review will be available for inspection at the locations stated in the notice, and providing information on how copies may be obtained. The notice will also provide that written data, views, comments, or requests for an informal public hearing on the State provisions may be submitted to the Director within the time specified in the notice.

(d) In making a determination with respect to any State laws or regulations, the Director will consider:

(1) Whether such laws and regulations are consistent with the purposes and policies of the Act and the rules and regulations issued thereunder;

(2) The extent to which such laws and regulations are consistent with, or constitute an integrated management or protection program with, the laws and regulations of other jurisdictions whose activities may affect the same species or stocks or marine mammals;

(3) The existence of or preparations for an overall State program regarding the protection and management of marine mammals to which the laws and regulations under review relate; and

(4) Any information received under paragraph (c) of this section.

(e) Upon completion of his review in accordance with paragraphs (c) and (d) of this section, the Director, in consultation with the Marine Mammal Commission, will decide whether or not to approve the State laws and regulations. To be approved, the State provisions must be consistent with (1) any Federal regulations issued under section 103 of the Act for the species or population stocks concerned and (2) any other provisions of the Act or regulations issued thereunder which apply to such species or population stocks. Upon making his decision, the Director will publish in the FEDERAL REGISTER a notice of approval or disapproval. If the State laws and regulations have been approved, the notice will summarize the management program established by the State provisions, specify the date on which the State's annual report it to be submitted under § 18.56(b) of this subpart, and, if necessary, state the extent to which the Act's moratorium on taking or importation is waived in order to allow such State laws and regulations to take effect. If the State laws and regulations have been disapproved, the notice will specify the reasons for the disapproval and will invite the submission of revised provisions under paragraph (a) or (b) of this section.

(f) Any modifications, amendments, deletions, or additions to State laws or regulations approved under paragraph (e) of this section, except emergency closings of seasons, shall, before adoption, require review and approval by the Director pursuant to paragraphs (c) through (h) of § 18.56 of this subpart.

(g) All determinations by the Director under this section shall be final.

§ 18.54 Review and approval of State laws and regulations implementing a waiver.

(a) Any State which requests a determination that its laws and regulations are consistent with the Act and applicable regulations in accordance with § 18.53 of this subpart may also request a waiver of the moratorium on taking and importation imposed by section 101 of the Act to the extent necessary to allow such laws and regulations to take effect.

(b) Where the State laws and regulations would implement a waiver of the moratorium, any waiver granted by the Director shall be contingent upon his approval of such State laws and regulations under § 18.53 of this subpart.

§ 18.55 Criteria for approval of State laws and regulations implementing a waiver.

Any State which applies to the Director for approval of its laws and regulations implementing a waiver of the Act's moratorium on taking or importation must demonstrate, to the Director's satisfaction, that such laws and regulations:

(a) Provide for a modern scientific resource management program, including but not limited to, research, census, law enforcement, habitat acquisition and improvement and, when and where appropriate, the periodic or permanent protection of the species or population stocks of marine mammals that would be affected by the State's laws and regulations;

(b) Establish a program which is based upon the best scientific evidence available on the relevant marine ecosystem and the role of the affected species or stocks of marine mammals in that ecosystem;

(c) Establish a program which is consistent with the Act's primary goal of maintaining the health and stability of the marine ecosystem;

(d) Establish a program which insures that the affected species or population stocks of marine mammals shall not diminish below the range of optimum sustainable population;

(e) Require cessation of taking of the affected species or population stocks of marine mammals, whenever the population is determined to be below the range of optimum sustainable population;

(f) Provide appropriate maximum quotas and seasons, whenever a taking is proposed, unless the State can show that it is more consistent with these criteria to have no quota or season;

(g) Establish quotas, seasons, and other allowances and restrictions as necessary to be consistent with the criteria of this section in accordance with the following factors:

(1) The seasonal distribution of populations;

(2) Segregation within populations by sex and age;

(3) Discreteness of populations;

(4) Population density;

(5) Critical periods in the species life cycle;

(6) Critical habitat areas;

(7) Productivity of the population;

(8) Species interactions;

(9) Percentage of retrieval by hunters;

(10) Maximization of the utilization of the species;

(11) Other uses of the species, such as recreational use or incidental catch; and

(12) Enforceability of the limitations.

(h) Contain suitable limitations on the means and methods of taking which assure that taking will be by humane means and will maximize the utilization of each animal taken.

(i) Contain provisions for significant public participation within the State in the process of implementing the waiver.

(j) Meet the criteria specified in § 18.53 of this subpart, to the extent that such criteria may differ from those prescribed in this section.

§ 18.56 Monitoring and review of approved State laws and regulations; reinstatement of the Act.

(a) All State laws and regulations and the conservation programs established thereby which have been approved shall be monitored and reviewed continuously.

(b) In order to facilitate such a review, each State having approved laws and regulations must submit an annual report not later than 60 days after the close of such State's first full fiscal year following the effective date of the Director's approval of the State laws and regulations and at the same time each following year. The report shall contain the following information current for each reporting period:

(1) Any changes in the State laws or regulations;

(2) Any new data on the marine mammal stocks or species or the marine ecosystems in question;

(3) All available information relating to takings under the terms of a waiver;

(4) A summary of all research activity on the stocks, species, or ecosystem affected by a waiver;

(5) Any changes in the information provided with the original request for approval;

(6) A summary of all enforcement activity, including permits issued, marine mammal parts or products sealed or marked, reports under permits, and investigations undertaken as well as their dispositions;

(7) Present budget and staffing level for the marine mammal activities; and

(8) Any other information which the Director may request, or which the State deems necessary or advisable.

(c) Each State, having approved laws and regulations shall file a special report within 30 days, whenever any of the following occurs:

(1) A proposed change in a relevant State law or regulation (amendments, repealers, or new legislation or regulations), which, with the exception of emergency closings of seasons, shall not be effective until the Director makes a determination pursuant to paragraphs (e) through (h) of this section;

(2) A significant natural or man-made occurrence affecting the marine ecosystems or the species or stocks of marine mammals to which a waiver applies; or

(3) A significant violation of the State management program including any quotas established thereby.

(d) All State laws and regulations and the conservation programs established thereby, as well as annual reports submitted under paragraph (b) and special reports submitted under paragraph (c) of this section, shall be available for inspection and copying at the Office of the Director, U.S. Fish and Wildlife Service, Washington, D.C. 20240.

(e) Upon receipt of any report described in §§ 18.56(b) or 18.56(c), the Director shall, as soon as practicable, in consultation with the Marine Mammal Commission, determine preliminarily whether or not the State laws and regulations and any programs established thereby continue to comply with the requirements of the Act and this subpart.

(f) Whenever the Director preliminarily determines, in consultation with the Marine Mammal Commission, that any substantial aspects of State laws and regulations or programs established thereby are or are not in compliance with the requirements of the Act or this subpart, he shall publish notice of such determination in the FEDERAL REGISTER inviting submission from interested persons, within 30 days of the date of the notice, of written data, views, comments, or requests for an informal public hearing with respect to such preliminary determination.

(g) As soon as practicable after the preliminary determination described

in § 18.56(e) and any 30-day comment period described in § 18.56(f), the Director, in consultation with the Marine Mammal Commission, shall determine whether or not to finally approve or disapprove the State laws and regulations. The Director's determination shall be made within 90 days after publication of any notice described in § 18.56(f), unless a hearing is held.

(h) If the Director makes a final determination to disapprove any proposed changes in State laws and regulations, the State shall, at the Director's sole discretion, have the option of retaining its initially approved laws and regulations, in which case any waiver shall remain in effect. All final determinations of approval or disapproval shall be published in the FEDERAL REGISTER. Upon publication of disapproval, unless a State, at the Director's sole discretion, elects within 30 days to retain its originally approved laws and regulations, any waiver conditioned upon approval of State laws and regulations as provided in this subpart shall terminate, and all provisions of the Act shall be reinstated and supersede such State laws and regulations.

§ 18.57 Notification on waiver quota.

Any State shall immediately notify the Director when the retrieved taking of any species or population stock of marine mammals reaches 90 percent of the numerical extent of the waiver prescribed by subpart H of this part for that species or population stock. The Director shall publish a Notice of Receipt in the FEDERAL REGISTER concerning such notification as soon after receipt thereof as practicable.

§ 18.58 Enforcement of State laws and regulations.

The appropriate official in each State shall utilize such methods as he deems appropriate to assure to the maximum extent practicable that the quotas, seasons, and other limitations in approved State laws and regulations are not exceeded. These methods may include, but are not limited to, patrols, surveillance, investigation, permit recordkeeping and reporting requirements, and tagging and marking requirements.

§ 18.59 List of waivers and States with approved laws.

The following is a list of the States whose laws and regulations have been approved by the Director pursuant to this subpart and the species or population stocks for which the moratorium has been waived within such States:

State, Common Name and Scientific name.
Alaska, Pacific Walrus, *Odobenus rosmarus.*

NOTE.—The Service has determined that issuance of these regulations is not a major action requiring preparation of an Economic Impact Statement under Executive Order 11949 and OMB Circular A-107.

Dated: September 26, 1978.

LYNN A. GREENWALT,
Director,
Fish and Wildlife Service.

[FR Doc. 78-27679 Filed 9-29-78; 8:45 am]

Appendix B

Amendments to final revised rule on

Service review of State laws and regulations

Federal Register, volume 44, number 9, page 2597,

Friday, January 12, 1979 (44 F.R. 2597)

[4310-55-M]

Title 50—Wildlife and Fisheries

CHAPTER I—UNITED STATES FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR

SUBCHAPTER B—TAKING, POSSESSION, TRANSPORTATION, SALE, PURCHASE, BARTER, EXPORTATION, AND IMPORTATION OF WILDLIFE AND PLANTS

PART 18—MARINE MAMMALS

State Laws and Regulations

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Rule amendments.

SUMMARY: The date for receiving a State's annual report on its approved marine mammal laws, regulations, and conservation program is amended to extend the due date from 60 to 120 days following the close of the reporting period and to include the calendar year, as well as the fiscal year, as recognized report periods. States may have difficulty in meeting reporting obligations because the current submittal deadline of 60 days after the close of the fiscal year may coincide with a period of heavy research and management activities; by allowing additional time after the close of the report period in which to submit their reports and also by giving States the option of reporting on a calendar-year basis, these changes will help them meet reporting requirements. A State's obligation to notify the Service when a certain percentage of the maximum annual retrieved taking quota is reached for mammals whose management has been returned is also modified to lower the percentage from 90 to 80 percent. This change will help the Service take appropriate emergency steps to notify the public and to meet its responsibility for insuring that waiver quotas, especially small ones, are not exceeded.

EFFECTIVE DATE: February 12, 1979.

FOR FURTHER INFORMATION CONTACT:

Mr. Rupert R. Bonner, Marine Mammal Coordinator, Office of Wildlife Assistance, U.S. Fish and Wildlife Service, Washington, D.C. 20240, telephone: 202-632-2202.

SUPPLEMENTARY INFORMATION: The regulations in revised Subpart F of 50 CFR Part 18, published in the FEDERAL REGISTER on October 2, 1978 (43 FR 45370-45374), established procedures for States to follow in requesting review and approval of their marine mammal laws and regulations. They also set forth procedures, standards, and criteria that the Service will use in reviewing, approving, and monitoring the State provisions and in superseding them should that become necessary.

Under the Marine Mammal Protection Act of 1972 (16 U.S.C. 1361 *et seq.*), the Service is obligated to continuously monitor and review approved State laws and regulations (16 U.S.C. 1379(a)(3)). To meet part of this obligation, the Service requires in § 18.56(b) of its revised Subpart F that each State with approved laws, regulations and conservation programs submit an annual report on them not later than 60 days after the close of its first full fiscal year following the effective date on which the Director approved them, and annually on that date thereafter. Because this requirement may place a severe reporting burden on States when their research and management activities are greatest, the Service is changing the due date for receiving the annual report from 60 to 120 days after the close of the reporting period and is including the calendar year, as well as the fiscal year, as an approved reporting period. These changes will assist States in meeting their reporting obligations; they will not adversely affect States' organizational, procedural, or operational frameworks, nor will they eliminate States' responsibilities to satisfy all reporting requirements.

Even after management of a species or population stock has been returned to a State under a waiver, the Service remains responsible for insuring that retrieved taking of involved marine mammals does not exceed the maximum number permitted by the waiver. To meet this responsibility, § 18.57 of the revised Subpart F requires a State to notify the Service when 90 percent of the maximum annual quota for a species or stock has been taken. As soon as practicable after receiving such a notification, the Service must publish an appropriate notice in the FEDERAL REGISTER and may initiate steps to prevent taking beyond the quota. Because it may be hard for the Service to take effective action by the time 90 percent of the quota has been taken, particularly when the quota is small, the notification level in 50 CFR 18.57 is being changed to 80 percent. This change will help the Service insure that a small-quota taking limit is not exceeded, but, like the changes in State reporting requirements, it will not adversely affect States because it does not alter their obligations to continuously monitor takings and notify the Service when a given taking level is reached.

Since this regulation merely clarifies the times when certain State reports and notifications are due and imposed no new requirements on States, organizations, or persons, the Director finds, pursuant to 5 U.S.C. 553 (b)(B), that notice and public procedure on this regulation are impracticable, unnecessary, and contrary to the public interest.

This document was prepared by Jackson E. Lewis, Marine Biologist, Office of Wildlife Assistance.

NOTE.—The Department has determined that this document is not a significant rule and does not require the preparation of a regulatory analysis under Executive Order 12044.

Accordingly, Subchapter B of Chapter I, Title 50, Code of Federal Regulations, is amended as shown below:

§ 18.56 [Amended]

1. The first paragraph of § 18.56(b) is amended to read as follows:

* * * * *

(b) In order to facilitate such a review, each State having approved laws and regulations must submit an annual report, which must be received not later than 120 days after the close of such State's first full fiscal or calendar year following the effective date of the Director's approval of the State laws and regulations and at the same time each following year. The report shall contain the following information current for each reporting period:

* * * * *

§ 18.57 [Amended]

2. Additionally, line 4 of § 18.57 is amended by deleting the words "90 percent" and inserting in their place "80 percent."

Dated: January 3, 1979.

LYNN A. GREENWALT,
Director,
Fish and Wildlife Service.

[FR Doc. 79-1266 Filed 1-11-79; 8:45 am]

Appendix C

Final rule on waiver of the moratorium on the taking of three Alaska marine mammals

Federal Register, volume 44, number 8, pages 2540-2547, Thursday, January 11, 1979 (44 F.R. 2540-2547)

[4310-55-M]

Title 50—Wildlife and Fisheries

CHAPTER I—UNITED STATES FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR

SUBCHAPTER B—TAKING, POSSESSION, TRANSPORTATION, SALE, PURCHASE, BARTER, EXPORTATION, AND IMPORTATION OF WILDLIFE AND PLANTS

PART 18—MARINE MAMMALS

Waiver of the Moratorium on the Taking of Three Alaska Marine Mammals

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final Rule.

SUMMARY: As part of an eventual return of management authority to the State of Alaska, regulations are issued which allow, subject to certain conditions, the taking of polar bears, sea otters, and Pacific walruses in Alaska or adjacent waters. The regulations waive the moratorium on such taking imposed by the Marine Mammal Protection Act. The regulations will not be effective until the Director approves the laws and regulations of the State of Alaska governing these mammals.

EFFECTIVE DATE: [Will be published by the Director at a later time.]

FOR FURTHER INFORMATION CONTACT:

Mr. Jackson E. Lewis, Office of Wildlife Assistance, U.S. Fish and Wildlife Service, Washington, D.C. 20240, Telephone: 202-632-2202.

SUPPLEMENTARY INFORMATION:

DIRECTOR'S DECISION

Background. On January 31, 1973, the State of Alaska requested that it be granted management authority over certain marine mammals pursuant to Federal approval of its proposed marine mammal regulations. *See* 16 U.S.C. 1379(a)(2). Alaska's proposed regulations deal with a number of marine mammals, three of which, the polar bear (*Ursus maritimus*), sea otter (*Enhydra lutris*), and Pacific walrus (*Odobenus rosmarus*), are placed under the Department's jurisdiction by the Marine Mammal Protection Act. 16 U.S.C. 1362(5)-(6), (12); 50 CFR 18.3. Because Alaska's proposed regulations allow taking of these mammals, approval of those regulations is necessarily contingent upon a waiver of the Act's moratorium on taking. *See* 16 U.S.C. 1371(a).

On April 5, 1976, the Director approved Alaska's Pacific walrus regulations and issued Federal regulations waiving the moratorium on the hunting and killing of this mammal 50 CFR 18.58, 18.94; 41 FR 14373. (For more detailed information concerning this earlier walrus waiver and return of management authority to the State of Alaska, see section *infra* entitled *"Waiver of the Moratorium—Pacific Walruses."*) On April 9, 1976, the Service published proposed regulations to modify the walrus waiver if revised Alaska regulations governing walruses were approved. 41 FR 15166. On April 9, 1976, the Service also announced its intention to review Alaska's regulations on polar bears and sea otters, and published proposed regulations to waive the moratorium on the taking of these mammals if the State regulations were approved. *Id.* After formal hearings on the record, Administrative Law Judge Malcolm Littlefield, on June 30, 1977, issued a recommended decision that regulations waiving the moratorium on the taking of polar bears and sea otters, and modifying the walrus waiver, be promulgated. Rec. Dec. 1, 91-92, 137-139; *see also* notice concerning this recommended decision at 42 FR 37215 (July 20, 1977). The portions of the Judge's recommended decision that are pertinent to these waiver regulations are adopted to the extent that such portions are consistent with the discussion, findings, and conclusions set forth herein.

Citations to Hearing Record and Recommended Decision. As used in this preamble: "ALJ" means Administrative Law Judge; "Br." means brief; "EDF" means Environmental Defense Fund; "Exh." means exhibit; "FWS" means U.S. Fish and Wildlife Service; "MMC" means Marine Mammal Commission; "Rec. Dec." means Recommended Decision (for these regulations) dated June 30, 1977, In the Matter of the Request of the State of Alaska to Waive the Moratorium on Nine Species of Marine Mammals and Allow the State to Resume Management, MMPA Docket No. Wash 76-1; "Rep. Br." means reply brief; "Tr." means transcript for the hearings on these regulations held in Alaska; "Walrus Rec." means the hearing record for the Pacific walrus regulations issued by the Service on April 5, 1976, 50 CFR 18.92-18.94, 41 FR 14372 (1976); *see also* 40 FR 59459 (1975); and "Wash. Tr." means transcript for the hearings on these regulations held in Washington, D.C.

Waiver of the Moratorium—General Requirements. As indicated previously, the Marine Mammal Protection Act imposes "a moratorium on the taking * * * of marine mammals." 16 U.S.C. 1371(a). However, the Act also provides that the Secretary may issue regulations which waive the moratorium and allow the taking of marine mammals. 16 U.S.C. 1371(a)(3)(A), 1973. The Secretary's authority under the Act has been delegated to the Director. 242 Intrerior Departmental Manual 1.

(The Act also imposes a moratorium on the importation of marine mammals. 16 U.S.C. 1371(a). However, since Alaska does not propose to allow the entry of mammals coming from foreign territories or beyond the waters under the jurisdiction of the United States, the regulations hereby published do not waive the moratorium on importation. *See generally,* 16 U.S.C. 1362(15), 1371(a)(3)(A); 50 CFR 10.12, 18.3; S. Rep. No. 92-863, 92d Cong., 2d Sess. 7,13 (1972) (hereinafter cited as "Senate Report").)

Regulations waiving the moratorium must comply with a number of substantive and procedural requirements. With respect to procedure, waiver regulations may be issued only after consultation with the Marine Mammal Commission. 16 U.S.C. 1371(a)(3)(A), 1373(a). There must be notice and an opportunity for a formal agency hearing on the record. 16 U.S.C. 1373(d). At the time the regulations are proposed, or before that time, the Service must publish and make available to the public statements setting forth the estimated existing population levels of the marine mammal stocks concerned, the expected impact of the regulations on the stocks' optimum sustainable populations, and the evidence upon which the regulations are based. 16 U.S.C. 1373(d)(1)-(3). The Service must also publish any studies and recommendations made by or for it or the Marine Mammal Commission which relate to the regulations. 16 U.S.C. 1373(d)(4).

The present regulations fulfill these procedural requirements. The draft environmental impact statement prepared in conjunction with the regulations, which was made available for public inspection and copying on March 5, 1976 (41 FR 9588), contained detailed statements concerning the estimated population levels of polar bears, sea otters, and Pacific walruses, the expected impact of the regulations on the optimum sustainable populations of the three mammals, and the evidence underlying the regulations. These statements were summarized in the notice of proposed rulemaking for the regulations. 41 FR 15166, 15167-15169 (April 9, 1976). The notice of proposed rulemaking also announced that the preparation of the draft environmental impact statement was the only known study relating to issuance of the regulations. 41 FR 15169.

After the proposed regulations were published, they were the subject of formal hearings on the record that were held in Alaska from June 29 through July 20, 1976, and in Wash-

ington, D.C., on October 19 and 20, 1976. The hearings provided the means for consultation with the Marine Mammal Commission, since the Commission participated fully in the proceeding, presenting evidence and advocating its position. The Commission was also consulted before publication of the proposed regulations and the draft environmental impact statement.

With respect to substantive requirements, regulations waiving the moratorium must be based on "the best scientific evidence available." 16 U.S.C. 1371(a)(3)(A), 1373(a). Full consideration must be given to the regulations' effect on "the distribution, abundance, breeding habits, and times and lines of migratory movements" of the three mammals and on their "existing and future (population) levels, (any) existing international treaty and agreement obligations of the United States * * * the marine ecosystem and related environmental considerations * * * the conservation, development, and utilization of fishery resources * * * and * * * the economic and technological feasibility of implementation." 16 U.S.C. 1371(a)(3)(A), 1973(b). In addition, the waiver regulations must insure that any taking permitted thereby will not be to the mammals' disadvantage and will be consistent with the Act's purposes and policies. 16 U.S.C. 1371(a)(3)(A), 1373(b), 1374(b)(1), (d)(3).

The Act's purposes and policies are stated as follows:

"* * * certain species and population stocks of marine mammals are, or may be, in danger of extinction or depletion as a result of man's activities * * *

"Such species and population stocks should not be permitted to diminish beyond the point at which they cease to be a significant functioning element in the ecosystem of which they are a part, and, consistent with this major objective, they should not be permitted to diminish below their optimum sustainable population. Further measures should be immediately taken to replenish any species or population stock which has already diminished below that population. In particular, efforts should be made to protect the rookeries, mating grounds, and areas of similar significance for each species of marine mammal from the adverse effect of man's actions * * *

"Marine mammals have proven themselves to be resources of great international significance, esthetic and recreational as well as economic, and it is the sense of the Congress that they should be protected and encouraged to develop to the greatest extent feasible commensurate with sound policies of resource management and that the primary objective of their management should be to maintain the health and stability of the marine ecosystem. Whenever consistent with this primary objective, it should be the goal to obtain an optimum sustainable population keeping in mind the optimum carrying capacity of the habitat." 16 U.S.C. 1361(1)-(2), (6).

In addition, the Act imposes a number of specific restrictions on taking under a waiver, including a requirement that all taking be authorized by a permit and be done in a humane and non-wasteful manner. *See* 16 U.S.C. 1371(b)(3), 1374; 50 CFR 18.3.

A number of these substantive requirements need further discussion.

The Act defines a "humane" method of taking as "that method * * * which involves the least possible degree of pain and suffering practicable to the mammal involved." 16 U.S.C. 1362(4). Regulations implementing the Act define a "wasteful manner" of taking as "* * * any taking or method of taking which is likely to result in the killing or injuring of marine mammals beyond those needed for subsistence purposes or for the making of authentic native articles of handicrafts and clothing or which results in the waste of a substantial portion of the marine mammal and includes without limitation the employment of a method of taking which is not likely to assure the capture or killing of a marine mammal, or which is not immediately followed by a reasonable effort to retrieve the marine mammal." 50 CFR 18.3. To be approved by the Director, Alaska's laws and regulations governing polar bears, sea otters, and Pacific walruses must insure that only humane and non-wasteful methods will be used in taking these mammals. 50 CFR 18.55(h), 43 FR 45373 (Oct. 2, 1978).

Regulations waiving the moratorium must take into account not only effects on entire species but also effects on individual "population stocks." 16 U.S.C. 1373. The Act defines "population stock" or "stock" as "a group of marine mammals of the same species or smaller taxa in a common spatial arrangement, that interbreed when mature." 16 U.S.C. 1362 (11). In his recommended decision on the present regulations, the Administrative Law Judge found that a single population stock does not mean that each animal in the stock has an equal opportunity to interbreed with every other animal, but rather that there are no barriers which prevent a continuous genetic interchange throughout the stock's range. Rec. Dec. 53. The Director adopts this finding.

Before issuance of regulations waiving the moratorium, it must be shown that the species or stock in question is at or above its "optimum sustainable population" and that the taking permitted by the waiver will not reduce the species or stock below that level. 16 U.S.C. 1361(2), (6), 1373(a), (b)(1); *See also, Committee for Humane Legislation, Inc. v. Richardson,* F. Supp. 297, 311-312 (D.D.C. 1976), *aff'd* 540 F. 2d 1141, 1149-1150 (D.C. Cir. 1976).

The Act defines "optimum sustainable population" (OSP) as:

"* * * the number of animals which will result in the maximum productivity of the species, keeping in mind the optimum carrying capacity of the habitat and the health of the ecosystem of which they form a constituent element." 16 U.S.C. 1362(9).

The National Marine Fisheries Service (NMFS) has interpreted the Act's definition to mean:

"a population size which falls within a range from the population level of a given species or stock which is the largest supportable within the ecosystem to the population level that results in maximum net productivity. Maximum net productivity is the greatest net annual increment in population numbers or biomass resulting from additions to the population due to reproduction and/or growth less losses due to natural mortality." 50 CFR 216.3; 41 FR 55536 (Dec. 21, 1976).

For the reasons set forth below, the Director accepts this definition of OSP.

The Administrative Law Judge and Marine Mammal Commission concluded that OSP falls within a range of population levels. Rec. Dec. at 37; ALJ Exh. 6 at 1-2. This finding appears reasonable in view of the references in the Act's definition to both maximum productivity and carrying capacity. 16 U.S.C. 1362(9). Furthermore, in *Committee for Humane Legislation v. Kreps,* No. 77-0564 (D.D.C. July 6, 1977), Judge Richey found that the NMFS definition of OSP as referring to a range of population sizes was reasonable and consistent with the Act.

The NMFS interpretation construes "maximum productivity" in the Act's definition to mean maximum net productivity, or the greatest net annual increment in population numbers or biomass resulting from additions to the population due to reproduction or growth of the animals less losses due to natural mortality. This definition is consistent with the accepted management practice of measuring productivity in terms of the annual production of new animals or the annual growth of the biomass (the aggregate weight of all the animals in the population). Maximum net productivity was held to be a reasonable imterpretation of maximum productivity in *Committee for Humane Legislation v. Kreps, supra.*

Maximum net productivity is also different from the "maximum sustained yield" (MSY) level rejected by Congress, the Marine Mammal Commission, and the Administrative Law Judge because it jeopardizes the health and stability of both the mammals and their ecosystem. H.R. Rep. No. 92-707, 92d Cong., 1st Sess. 22 (1971) (hereinafter cited as "House Report"); Hearings on Marine Mammals Before the Subcomm. on Fisher-

ies and Wildlife Conservation of the House Comm. on Merchant Marine and Fisheries, 92d Cong., 1st Sess. ser. 92-10, at 401 (1971) (hereinafter cited as "House Hearings"); Rec. Dec. at 35-37; ALJ Exh. 6 at 3. As the Commission and Administrative Law Judge have pointed out, management under the MSY theory keeps the population at the level where its produces the greatest number of new animals of the age and sex of interest to man. Rec. Dec. at 35; EDF Br., App. 4 at 8. This level may be considerably different from the one resulting in maximum net biological productivity, which occurs regardless of whether or not there is a harvest. *Id.* Furthermore, an essential component of MSY management is its level of taking: a harvest of all animals not needed to maintain the population at the maximum productivity level. ALJ Exh. 6 at 2. A harvest this large prevents the population from growing. *Id.;* Rec. Dec. at 34. A smaller harvest that allows growth of the population is not consistent with the MSY theory.

Under the NMFS definition, the upper boundary of the OSP range is the population size that is the largest supportable by the ecosystem. A population at this level is said to be at the carrying capacity of its habitat; in other words, at its maximum natural level or "equilibrium unexploited level." Rec. Dec. at 37; ALJ Exh. 6 at 1, Neither Exh. 5 at 6. This level was found to be a reasonable upper boundary for OSP by Judge Richey in *Committee for Humane Legislation v. Kreps, supra.*

At the hearings on these regulations, it was argued that the carrying capacity or equilibrium unexploited level should be the only level of OSP. However, in certain instances, it may be to the advantage of a stock to be reduced below the carrying capacity level. At the carrying capacity level, a significant number of animals may suffer from disease, malnutrition, and agressive behavior due to increased competition for space and food. ALJ Exh. 6 at 3. Stocks at the carrying capacity level may also be vulnerable to losses of food and essential habitat areas resulting from shifts in weather and other factors. *Id.* Furthermore, if OSP were equivalent to carrying capacity, taking under a waiver would be allowable only in instances of overpopulation. Yet it is clear that Congress did not intend overpopulation to be the sole basis for a waiver. 16 U.S.C. 1374(b); House Report at 20, 25; Senate Report at 16-17; H.R. Rep. No. 92-1488, 92d Cong. 2d Sess. 24 (1972) (hereinafter cited as "Conference Report").

For the reasons discussed above, the Director accepts the definition of OSP adopted by the National Marine Fisheries Service in which OSP is defined as a population size falling within a range that is bounded by the level at the carrying capacity of the habitat and the level resulting in maximum net productivity.

Regulations waiving the moratorium must insure that any taking permitted will not be to the "disadvantage" of the species or stock concerned. The Director accepts the finding of the Administrative Law Judge that a species or stock is disadvantaged if it is below or above the range of its OSP. *See* Rec. Dec. 40-41.

The Director also accepts the finding of the Administrative Law Judge that a species or stock is depleted under section 3(1)(C) of the Act, 16 U.S.C. 1362(1)(C), if it is below the range of its OSP. *See* Rec. Dec. 39-41.

Waiver of the Moratorium—Polar Bears. The Administrative Law Judge found that there are two stocks of polar bears in Alaska and adjacent waters, a northern stock and a western stock. Rec. Dec. 54, 79. The northern stock is made up of bears found north and east to the Canadian border from a line extending northwest from Point Lay, Alaska, and the western stock is made up of bears found west and south of that line. Rec. Dec. 78-79. Bears from the western stock have larger skulls and bodies, while those from the northern stock have higher mercury levels. Rec. Dec. 53. These findings are well supported in the hearing record for these regulations, FWS Exh. 8 at 326-327; Tr. 32; MMC Exh. 7 at 4, and are accepted by the Director.

The Administrative Law Judge found that each stock of polar bears is within the range of its OSP. Rec. Dec. 80-81. He further found that the annual taking of 170 bears (one-third of that figure to be taken from the northern stock and two-thirds from the western stock) would not reduce either stock below the range of its OSP and maintain the health and stability of the marine ecosystem. Rec. Dec. 83-86. He therefore recommended a waiver of the moratorium to allow this level of taking. Rec. Dec. 86.

The Judge's decision and the accompanying record show that due consideration has been given to the range and distribution of the two stocks, Rec. Dec. 66, 78-82, 84, FWS Exh. 1 at 1, 6, Exh 2 at 367, Exh. 5 at 44, 46, Exh. 8, Exh. 10 at 2-3, Tr. 32, 68, 81-83, 114; the abundance and population levels of the stocks (*see* discussion of OSP below); the bears' breeding and reproduction habits, Rec. Dec. 65, 84, 132, FWS Exh. 1, at 1-2, Exh. 7, Exh. 10 at 3-4, MMC Exh. 6, Tr. 41, 48, 63, 68, 85, 106-109; the bears' migrations with respect to seasons, movement of the ice, and availability of food, Rec. Dec. 65, 84, 132, FWS Exh. 1, at 1, 7, Exh. 2 at 367, Exh. 5 at 46, Tr. 66, 90-91, 101, 108; the international Agreement on the Conservation of Polar Bears, Nov. 15, 1973, 13 Int'l Leg. Mats. 13-18 (1974), Rec. Dec. 68, 85, FWS Exh. 1 at 12-13, Exh. 6 at 8-9, Exh. 9, Exh. 13, Exh. 23, MMC Exhs. 5-6, FWS Br. at 62; the relationships between polar bears and seals, fish, and other components of the marine ecosystem, Rec. Dec. 37-38, 83, FWS Exh. 1 at 1, 7, Exh. 10 at 3, MMC Exh. 6, Tr. 35-36, 84-85, 90-91, 102, 104-106; the conservation, development, and utilization of fishery resources, Rec. Dec. 37-38, FWS Exh. 1 at 7, Tr. 36, 84-85; and the feasibility of implementing the present regulations as well as those proposed by the State of Alaska, Rec. Dec. 63-65, 69-72, 84, 122-123, 127-128, Tr. 39-43, 46-47, 54-56, 69-70, 96, MMC Exh. 6.

On the question of OSP, the Service's expert on polar bears estimated that there are between 2,300 and 2,600, or approximately 2,500, bears in the northern stock, and between 6,400 and 7,200, or approximately 7,000, bears in the western stock. FWS Exh. 1 at 4; Exh. 19; Tr. 32, 57. These estimates were obtained by computer modeling with a wildlife population model developed at the Cooperative Wildlife Research Unit, Colorado State University. FWS Exh. 1 at 4. The model utilized population composition data obtained from bears taken by hunters since 1961 and from bears captured for marking and later recovery pursuant to a program started in 1967. FWS Exh. 1 at 4-5; Exh. 19; Tr. 58. The Service's expert also testified that in his opinion, polar bears are probably approaching the carrying capacity level and are widely distributed, being found in most, if not all, of the habitat that is suitable to them. Tr. 36-37, 78-79.

Based on this evidence, the Service's polar bear expert concluded that each stock of polar bears was within the range of its OSP. Tr. 33-37.

The Marine Mammal Commission agrees with the Service's expert that the northern stock is approximately half the size of the western stock. MMC Exh. 7 at 4, MMC Br. at 9. However, the Commission disagrees with the Service's witness on the number of animals in the two stocks.

The Commission questioned the reliability of the Service's computer estimates because of lack of information on how the computer model was constructed or used. MMC Exh. 7 at 2; Wash. Tr. 233. The Commission also submitted an estimate of its own—a total of 6,100 bears for the two stocks combined. MMC Exh. 8 at 1; Wash. Tr. 32. This estimate was based on analysis of the age composition of adult males killed annually by hunters and on an assumption that the bears' natu-

ral mortality rate is 5 percent. MMC Exh. 7 at 2-3; Exh. 8 at 1; Wash. Tr. 32. The Commission further concluded that the "best scientific estimate" is 5,700 bears for the two stocks combined. MMC Exh. 8 at 1; Wash. Tr. 32, 233-234. This estimate was obtained by averaging a 1959 estimate of 2,500 bears based on an aerial survey by sport hunting guides, a 1972 estimate of 4,925 bears based on analysis of the ages of male bears harvested over a five-year period, the Commission's 1976 estimate of 6,100 bears, and the Service's 1976 computer estimate of 9,500 bears. MMC Exh. 7 at 2; Exh. 8 at 1; FWS Exh. 1 at 2, 4; Exh. 2 at 367-369, Exh. 4; Wash. Tr, 32, 233-234. The 5,700 estimate was accepted by the Administrative Law Judge, Rec. Dec. 86, and as noted by the Commission, it is significantly close to an estimate of 5,500 bears that can be obtained by averaging the 4,925 and 6,100 figures regarded by the Commission as the most reliable of the four. MMC Exh. 8 at 1; Wash. Tr. 233-234.

By comparing the average number of polar bears killed annually from 1961 to 1972 with the lower annual average before 1961 (*see* FWS Exh. 1 at 8-9), the Commission concluded that the level of killing from 1961 to 1972 was not such that it would have reduced the polar bear population below the level of maximum productivity. Wash. Tr. 235; MMC Exh. 7 at 1. The Commission therefore concluded that the two polar bear stocks are within the range of OSP. MMC Exceptions at 5.

Believing it safer to adopt the more conservative estimate, the Director accepts the finding of the Commission and the Administrative Law Judge that the best scientific estimate of the total Alaska polar bear population is 5,700 bears. Accepting the views of both the Commission and the Service's expert that the northern stock is approximately half the size of the western stock, their respective populations are estimated to be 1,900 and 3,800 bears. Based on the evidence presented by both the Service and the Commission, the Director finds that each stock is within the range of its OSP.

The Administrative Law Judge and Marine Mammal Commission found that the annual taking of 170 polar bears (one-third of that figure to be taken from the northern stock and two-thirds from the western stock) would not reduce either stock below the range of its OSP and would maintain the health and stability of the marine ecosystem. Rec. Dec. 83-86; MMC Br. at 9. Accordingly, both the Judge and the Commission recommended a waiver of the moratorium to allow this level of taking.

Allocating approximately one-third of the total annual limit of 170 bears to the northern stock and approximately two-thirds to the western stock, their respective individual limits would be 55 and 115 bears. This level of taking would constitute only 2.89 and 3.03 percent of their respective estimated populations of 1,900 and 3,800 bears. The hearing record for these regulations indicates that the net annual recruitment of new bears to each stock is between 6 and 10 percent of its population. FWS Exh. 1 at 4; Tr. 47-48. Thus, limits of 55 and 115 bears for the northern and western stocks, respectively, will permit both stocks to continue to increase in abundance, *see* Rec. Dec. 86, MMC Br. at 9, and this increase will insure that they remain within the range of OSP and continue to be significant functioning elements in their respective ecosystems. The Director therefore concludes that a waiver of the moratorium to allow the annual taking of 55 polar bears from the northern stock and 115 polar bears from the western stock is appropriate under the Act.

Waiver of the Moratorium—Sea Otters. The Administrative Law Judge found that sea otters in Alaska occur in a number of individual colonies, but that these colonies are all part of one stock. Rec. Dec. 54-55, 90. The Director accepts this finding. It is well supported by the record for these regulations which shows that there has been interbreeding between colonies and establishment of new colonies as a result of sea otters crossing the largest geographical barriers within their range. FWS Exh. 15 at 4-6; Tr. 154-156, 178-179, 182, 229, 250-251. The Marine Mammal Commission concluded that, genetically, sea otters in Alaska "must be treated as a single population." Wash. Tr. 244.

The Administrative Law Judge found that the Alaska sea otter stock as a whole is within the range of OSP but that individual colonies of the stock are at various levels within that range, and at least two are either below, or barely at, the lower boundary of OSP. Rec. Dec. 1,88,90,137. The Judge also found that the annual taking of 3,000 sea otters from the Rat Islands-Delarof Island colony and the Andreanof Islands colony, if allocated between the two groups, "would be within the range of OSP and present no immediate threat to the species." Rec. Dec. 89-90. However the Judge believed that a waiver of the moratorium on the entire stock would be "legally inappropriate." Rec. Dec. 90.

As with polar bears, the Administrative Law Judge's decision and the accompanying record show that due consideration has been given to the range and distribution of the sea otter stock, Rec. Dec. 54,89, ALJ Exh. 3 at 31-32; FWS Exh. 15 at 2-16, Exh. 16 at 1-2, Tr. 154-156, 226-229; the abundance and population levels of sea otters (*see* discussion of OSP below); the otters' breeding and reproduction habits, FWS Exh. 15 at 22-23, Tr. 178-179, 194, 225, 232; the otters' migrations across stretches of water from densely populated areas to sparsely populated or unpopulated areas, Rec. Dec. 54-55, FWS Exh. 15 at 4-6, Tr. 178-179, 229, 250-251; the relationships between sea otters and fish, sea urchins, kelp, and other components of the marine ecosystem, Rec. Dec. 87-88, FWS Exh. 17, Tr. 176-177, 181-182, 201, 203-206, 230-232; the conservation, development, and utilization of fishery resources, Rec. Dec. 88, Tr. 144, 175-177, 205-207, 218-220, 278-279; and the feasibility of implementing the present regulations as well as those proposed by the State of Alaska, Rec. Dec. 63-64, 69-70, FWS Exh. 15 at 22, Tr. 148-150, 157-158, 174-175, 180-181, 183-185, 195-198, 200, 213-216, 246.

With respect to population size and OSP, the Service's prinicipal witness on sea otters estimated that the population of the stock is between 100,000 and 140,000 otters. FWS Exh. 15 at 6-16; Tr. 142. This estimate was obtained by dividing the stock into management groups and then adding together the estimates for the individual groups. FWS Exh. 15 at 6. To obtain the estimates, airplane, helicopter, boat, and shore surveys were taken. There was also analysis of size, physical condition, growth rates, incidence of beach dead juveniles, and other data from experimental harvests and transplant programs. FWS Exh. 15 at 7-16. Adjustments were made based on the efficiency of the survey techniques. The efficiency of a technique was evaluated by comparing counts from two or more techniques and by analyzing the effects of known losses to the population in question. FWS Exh. 15 at 6-7. Although the record contains higher estimates, *see* FWS Exh. 16 at 1, the total estimate of 100,000 to 140,000 otters was accepted by the Marine Mammal Commission as the "best available evidence at this time with which to evaluate the proposed waiver." MMC Exh. 7 at 6, *see also* Wash. Tr. 247-249. The Director accepts this estimate.

The evidence in the record indicates that the 100,000-140,000 estimate is within the range of the stock's OSP. Approximately half of the suitable sea otter habitat now supports populations that are at or above the carrying capacity level. FWS Exh. 15 at 16. The stock now exists in most of its former range. *Id.* at 17. It is estimated that the present number of sea otters is approximately 75 percent of the total number that would exist in an undisturbed state throughout all of the available habitat in Alaska. *Id.* at 17, Tr. 166. The stock's overall rate of pro-

ductivity is below maximum and declining. FWS Exh. 15 at 17. Although the total population of the stock is still increasing, the rate of increase is decreasing. Tr. 143.

In view of this evidence and other evidence in the record relating to mortality of juveniles, FWS Exh. 15 at 23, Tr. 169-170, reduction in the rate of body growth and body size, FWS Exh. 15 at 23, changes in diet and time budgets, *Id.*, and the otters' birth rate of approximately 20 to 25 percent, Tr. 194, the Service's principal expert on sea otters, the Marine Mammal Commission, and the Administrative Law Judge concluded that the Alaska stock of sea otters is within the range of OSP. FWS Exh. 15 at 17; Tr. 143; Wash. Tr. 252; MMC Exceptions at 1; Rec. Dec. 1, 88, 137. The Director accepts this finding.

Despite his conclusion that the stock as a whole is within the range of OSP, the Administrative Law Judge found that a waiver of the moratorium was appropriate only for the Rat Islands-Delarof Island colony and the Andreanof Islands colony. Rec. Dec. 90. The Judge found that a waiver for the entire stock was "legally inappropriate" because certain colonies within the stock may be below the range of OSP. *Id.*

The Director believes that it is legally permissible to waive the moratorium for the entire stock if the taking authorized by the waiver regulations will not reduce the stock below the range of OSP and will maintain the health and stability of the marine ecosystem. 16 U.S.C. 1361(2), (6), 1373(a), (b)(1); *see also, Committee for Humane Legislation, Inc. v. Richardson supra.* The stock's net annual growth rate was estimated to be between 3 and 5 percent, and rates of 10 to 20 percent appear to be theoretically possible. MMC Exh. 7 at 6-7; Tr. 248. An annual limit of 3,000 for the stock, as suggested by the Marine Mammal Commission, would amount to only 2.14 to 3 percent of the estimated population of 100,000 to 140,000 otters. Thus, a limit of 3,000 otters would permit the stock to continue to increase in population and thereby remain within the range of OSP. However, to insure that sea otters are a significant functioning element throughout their historic range, the taking under the waiver must be restricted to otters from colonies that are themselves within the range of OSP and are not contributing to the repopulation of additional sea otter habitat. Also, the taking must be allocated between such colonies so that it does not exceed 3.5 percent of the population of any one of them. *See* FWS Exh. 16 at 5; Tr. 239-242; Wash. Tr. 246-247.

Accordingly, the Director finds that it is appropriate to waive the moratorium for the entire stock of Alaska sea otters so as to allow the annual taking of 3,000 animals. However, this taking may occur only from colonies that are themselves within the range of OSP and are not contributing to the repopulation of additional sea otter habitat, and in no event may the taking exceed 3.5 percent of the population of any such colony.

Waiver of the Moratorium—Pacific Walruses. After extensive hearings in Alaska and Washington, D.C., in the spring and summer of 1975, regulations were issued which waived the moratorium on the hunting and killing of Pacific walruses. 50 CFR 18.58, 18.94; 40 FR 59459 (Dec. 24, 1975); 41 FR 14373 (April 5, 1976). In addition, management authority for the Pacific walrus has been returned to the State of Alaska pursuant to approval of the State's laws and regulations governing that mammal. 40 FR 59459 (Dec. 24, 1975); 41 FR 14373 (April 5, 1976).

On April 9, 1976, as part of the proposal relating to polar bears and sea otters, the Service published proposed regulations to modify the walrus waiver by extending it to taking other than hunting and killing. 41 FR 15166. However, the annual limit on taking would remain the same, 3,000 animals. *Id.* at 15172. As Administrative Law Judge Littlefield pointed out in his recommended decision, the Service agreed that in modifying the 1976 walrus waiver, it would rely on the record made for that waiver, but other participants could submit additional evidence relating to the status of walruses or to the Alaska or Federal regulations governing the mammal. Rec. Dec. 15.

At the hearings on this modified waiver, the only evidence submitted (other than the record for the 1976 waiver) was a set of answers by the State of Alaska to interogatories propounded by Monitor, Inc. Neither Exh. 1, Exh. 3. The Administrative Law Judge found the nothing in the State's answers tends to show that the 1976 return of management to the State is in any manner contrary to the mandates of the Act. Rec. Dec. 91. The Judge further concluded that waiver of the moratorium on the taking of Pacific walruses is consistent with the Act. Rec. Dec. 91-92. Since the modified waiver will impose the same annual limit on taking as the 1976 waiver and will also provide more effective protection for Pacific walruses (*see* section entitled *"Description of the Waiver Regulations" infra*), the Director finds that the modified waiver is appropriate.

Best Scientific Evidence Available. Regulations waiving the moratorium must be based on the "best scientific evidence available." 16 U.S.C. 1371(a)(3)(A), 1373(a). The Environmental Defense Fund, Monitor, Inc., the Marine Mammal Commission, and other participants in this rulemaking have commented on the desirability of further analysis of existing data, the desirability of obtaining more data, and a number of factors which lend uncertainty to the conclusions reached by the experts who testified.

In *Committee for Humane Legislation v. Kreps, supra* at 50, Judge Richey interpreted the "best scientific evidence available" standard to mean "the latest and most up-to-date evidence and knowledge and experience available." During the hearings on these regulations, testimony was received from recognized experts on polar bears and sea otters as well as from a distinguished expert in the field of wildlife population analysis who at the time of his testimony served as Chairman of the Marine Mammal Commission's Committee of Scientific Advisors and who is presently the Chairman of the Commission itself. Rec. Dec. 24-25, 28-29; MMC Exceptions at 6, n.1. The 1976 Pacific walrus waiver regulations were also based on the testimony of recognized experts. Wal. Rec.: Tr. 1088. The data analyzed by these experts was derived from a number of sources and survey techniques. The population estimates and OSP determinations adopted by the Director in these reg-ulations are regarded by the Marine Mammal Commission as being supported by the best scientific evidence available. MMC Br. 1, 9-10; MMC Rep. Br. at 1; MMC Exceptions at 1, 5, 7; MMC Exh. 7 at 6-7, Exh. 8 at 1; Wash. Tr. 232-235, 246, 246-249, 251-252; Wal. Rec.: Tr. 1082-1084, 1088-1089, 1129-1130; MMC Br. 10,39; MMC Rep. Br. 1-2, 13.

The standard of "best scientific evidence available" does not require inaction simply because future studies may develop more data and scientific certainty. In *Committee for Humane Legislation v. Kreps, supra* at 49-50. Judge Richey approved the taking of marine mammals even though he recognized that as of 1977, "[t]he state of research and the state of knowledge with respect to [the] subject matter (of marine mammals) is far from complete, and much remains to be learned and done about marine mammal populations * * *."

Nevertheless, to provide an even greater margin of safety, these regulations accept the recommendation of the Marine Mammal Commission and require that a workshop be held to further obtain and analyze data on polar bears, sea otters, and Pacific walruses. The findings and data from this workshop must be included in the annual report received by the Director from the State of Alaska within 120 days after the close of the first full calendar year following the effective

date of these regulations pursuant to 50 CFR 18.56(b). The waiver regulations for the three mammals will be reevaluated in light of this report. If the report does not contain the findings and data from the workshop, the waiver granted by these regulations for polar bears and sea otters, and modified thereby for Pacific walruses, may be terminated.

Description of the Waiver Regulations. This waiver of the moratorium on the taking of polar bears, sea otters, and Pacific walruses will be governed by these regulations and by the laws and regulations of the State of Alaska. Issuance of these regulations waives the moratorium and these regulations also impose appropriate conditions and limitations on the waiver. The regulations of the State of Alaska, which must be approved by the Director under section 109(a)(2) of the Act, 16 U.S.C. 1379(a)(2), and Subpart F of 50 CFR Part 18, 43 FR 45372, will provide the details of the conservation and management program for the three mammals by prescribing seasons, hunting areas, humane and non-wasteful methods of taking, license and permit requirements, and other management procedures.

The regulations originally proposed by Alaska to implement this waiver were submitted with its 1973 request for a return of management authority over the mammals. The 1973 proposal is contained in Appendix D to the draft environmental impact statement for the waiver. In August of 1975, Alaska submitted revised regulations for the mammals. The 1975 regulations are set forth in Appendix G to the draft impact statement and also in Appendix G to the final impact statement. In its comments in 1977 on the recommended decision for the waiver, Alaska indicated that it intended to submit another set of regulations for the three mammals. Alaska Comments at 9-10.

In view of the State's intention to submit new regulations, the Director will not make a consistency determination on the 1975 revision. Instead, Alaska's new regulations will be reviewed once they are received. The Federal regulations published herein will not be effective unless Alaska's regulations are approved.

These Federal regulations will be codified in 50 CFR 18.92-18.95. Section 18.92 defines a number of important terms used in these regulations. The definitions prescribed in § 18.92 will be discussed in the description of other sections.

Section 18.93 waives the moratorium on the taking of sea otters by allowing them to be taken in Alaska. Section 18.92(a) defines "Alaska" as all lands within the State of Alaska and all waters within the State's three-mile seaward boundary. Because the Fur Seal Act, 16 U.S.C. 1171(a), prohibits the taking of sea otters on the high seas, the moratorium remains in effect beyond the seaward boundary of the State of Alaska.

Section 18.93 also waives the moratorium on the taking of polar bears and Pacific walruses by allowing them to be taken in Alaska or the "waters off Alaska". Section 18.92(f) defines "waters off Alaska" to include certain waters beyond "Alaska" (as that term is defined in § 18.92(a)).

Section 18.94 limits the extent of the waiver by imposing a number of conditions on it. Section 18.94(a) provides that the moratorium is waived only for taking by persons, residents or non-residents, who are subject to the jurisdiction of the State of Alaska. Because the State of Alaska must administer the conservation and management program for the mammals concerned, these regulations do not allow taking by persons who are not subject to the State's jurisdiction. Consequently, § 18.94(a) further provides that all taking allowed by these regulations must comply with the laws and regulations of the State of Alaska.

Section 18.94 imposes an annual limit on the number of animals that may be taken from each stock. This annual limit is the aggregate number for the stock. The limit must be apportioned between individual takers and groups of takers in a manner consistent with sound principles of conservation and management.

The annual limit for each stock is the total number of animals that may be removed from the natural habitat in any calendar year as a result of all takings. Section 18.92(e) defines "removed from the natural habitat" to mean that the animal has been killed and retrieved, or has been captured for purposes other than immediate return to the natural habitat. Thus, for example, animals captured for tagging or marking will not count against the annual limit unless they are killed or seriously injured in the process. Section 18.92(d) defines "natural habitat" to mean the habitat in which the animal lives as a wild animal. The director believes that removal from the natural habitat is the best measure for the annual limit in view of the Act's primary purposes to protect and maintain the health and stability of wild populations and the ecosystems of which they form essential parts. 16 U.S.C. 1361(2), (6), 1362(8)-(9), 1373(a).

Because the record for these regulations indicates that an undetermined, but possibly considerable, number of polar bears and Pacific walruses are being killed unlawfully for their valuable hides and ivory, respectively, and that activities associated with oil exploration and development pose a significant threat to polar bears, walruses, and sea otters, MMC Exh. 4 at 2, Tr. 38-39, 69-71, 85, 87, 150, 198-200, Walrus Rec.: Tr. 107, 149, 669-670, 675, 682-686, 697-698, 916-917, the Director believes that the annual limits must include the number of animals removed from the natural habitat as a result of unlawful taking and incidental taking. Including illegally killed animals in the annual limit will create an incentive for improved enforcement efforts, since for each animal killed unlawfully, one less may be killed lawfully. Likewise, including animals killed incidentally as a result of fishing, oil development, and other activities will create an incentive for reducing such incidental taking, since for each animal killed incidentally, one less may be killed directly.

Because there are two stocks of polar bears, each stock has it own annual limit. *See* previous discussion under *"Waiver of the Moratorium—Polar Bears."* To insure that sea otters are a significant functioning element throughout their historic range, protection must be given to each individual colony. Thus, § 18.94(h)-(i) provides that sea otters may be taken only from colonies which are themselves within the range of OSP and are not contributing to the repopulation of other areas, and that the annual limit for each such colony may not exceed 3.5 percent of its population.

Under § 18.94(j), the annual limit for Pacific walruses is 3,000 animals. To mitigate the problem of animals killed but not retrieved, § 18.94(l) provides that any person who kills or injures any walrus, bear, or sea otter must immediately make a reasonable effort to retrieve or capture such mammal.

Section 18.94 also imposes a number of other conditions on the waiver. To facilitate enforcement, § 18.94(m) establishes certain marking and tagging requirements for mammals taken under these regulations. Section 18.94(n) provides for either suspension of taking or reimposition of the moratorium if it appears likely that the annual limit for any stock or colony may be exceeded. Section 18.94(o) provides that the Director will take all appropriate action to terminate any taking found to be inconsistent with the Act or its regulations, including, if necessary, reimposition of the moratorium. Section 18.94(p) establishes the workshop requirement described previously in the section entitled *"Best Scientific Evidence Available."*

Section 18.95(a) requires that any taking allowed by the waiver be authorized by a written license or permit issued by the State of Alaska.

Under the Act, permits for scientific research or public display may be issued without a waiver of the morato-

rium. 16 U.S.C. 1371(a)(1). The Act's legislative history indicates that Congress contemplated that after return of management authority to a State pursuant to approval of its laws, such State could assign scientific research or public display permits to qualified persons in accordance with the provisions of a general permit for scientific research or public display issued to the State by the Secretary. Conference Report at 26. Accordingly, § 18.95(b) provides that the State of Alaska may assign scientific research or public display permits to qualified persons in accordance with the terms of a general permit issued to the State by the Service. Since the Service may also be issuing a limited number of scientific research or public display permits and since removals from the natural habitat under either Alaska or Service permits will count against the annual limit for the stock or colony, it is imperative that responsible State and Service officials keep each other informed of the number of permits issued in order to insure that the annual limit is not exceeded.

Finally, for purposes of clarity, these regulations make a number of changes in the organization and wording of the proposed rules published on April 9, 1976, 41 FR 15166. Also, these regulations omit certain paragraphs in the proposed rules concerning enforcement provisions for polar bear hides. Similar provisions will be contained in the laws and regulations of the State of Alaska, and the State will also prescribe additional requirements to facilitate enforcement.

The Act's Native Exemption. The Director adopts the conclusion of the Administrative Law Judge that the State of Alaska may regulate the taking of marine mammals by Alaska natives for subsistence, handicraft, or clothing purposes after a waiver of the moratorium and return of management authority to the State. The Director does not adopt the Judge's conclusion or rationale to the extent they suggest or imply that Alaska may not regulate native taking for such purposes before a waiver and return of management authority or that a waiver and return of management authority are necessary prerequisites to the States regulation of native taking.

It is the Director's view that the Act did not totally preempt State jurisdiction over Alaska natives. Section 101(b) of the Act, 16 U.S.C. 1371(b), states that "the provisions of this Act shall not apply" with respect to non-wasteful takings of non-depleted species of marine mammals by Alaska natives for subsistence, handicraft, or clothing purposes. Section 109(a)(1), 16 U.S.C. 1379(a)(1), which provides that "no State may adopt any law or regulation relating to the taking of marine mammals," is one such provision that "shall not apply" under the terms of Section 101(b). Thus, the Act did not preempt State law governing Alaska native takings unless the species are depleted, the takings are wasteful, or the takings are for purposes other than handicrafts, clothing, or subsistence. Congress left native handicraft, clothing, and subsistence taking exactly as it was before the Act, regulated by the State of Alaska. While native subsistence taking evidently is preferred to other kinds of taking under the Act, the Director does not regard this preference as overriding the Act's policy of protecting marine mammals.

These regulations are issued under the Marine Mammal Protection Act of 1972, 16 U.S.C. 1361-1407. They were prepared by Ronald Swan, Office of the Solicitor, Department of the Interior.

Dated: January 4, 1979.

KEITH M. SCHREINER,
Acting Director.

Accordingly, Part 18 of Title 50, Code of Federal Regulations, is amended as set forth below:

1. Subpart H of the Table of Contents is revised to read as follows:

Subpart H—Waiver of the Moratorium on the Taking of Polar Bears, Sea Otters, and Pacific Walruses in Alaska or the Waters Off Alaska

AUTHORITY: Marine Mammal Protection Act of 1972, 16 U.S.C. 1361-1407.

Subpart H—Waiver of the Moratorium on the Taking of Polar Bears, Sea Otters, and Pacific Walruses in Alaska or the Waters Off Alaska

2. Subpart H is revised to read as follows:

§ 18.92 Definitions.

As used in this Subpart H:

(a) "Alaska" means all lands within the State of Alaska and all waters within the seaward boundary of the State of Alaska;

(b) "Colony" means a group of sea otters found in a common area that is isolated by a body of water or other physical barrier which impedes, but does not prevent, genetic interchange with sea otters outside the common area;

(c) "Optimum sustainable population" means a population size which falls within a range from the population level of a given species, stock, or, in the case of sea otters, colony which is the largest supportable within the ecosystem to the population level that results in maximum net productivity. Maximum net productivity is the greatest net annual increment in population numbers or biomass resulting from additions to the population due to reproduction and/or growth less losses due to natural mortality;

(d) "Natural habitat" means the habitat in which a marine mammal lives as a wild animal;

(e) "Removed from the natural habitat" means that the animal has been killed and retrieved, or has been captured for purposes other than immediate return to the natural habitat;

(f) "Waters off Alaska" means waters outside Alaska, and west of longitude 130 degrees West, north of latitude 50 degrees North, east of the Convention Line of 1867 between the United States and the Union of Soviet Socialist Republics, and south of latitude 75 degrees North.

§ 18.93 Waiver of the moratorium.

Subject to the provisions of this Subpart H, sea otters may be taken in Alaska and polar bears and Pacific walruses may be taken in Alaska or the waters off Alaska.

§ 18.94 Conditions of the Waiver.

(a) Any taking allowed by this Subpart H may be done only by a person who is subject to the jurisdiction of the State of Alaska and must comply with the laws and regulations of the State of Alaska.

(b) The total number of polar bears which may be removed from the natural habitat in Alaska and waters off Alaska, in the area east of a line extending northwest and southeast from Point Lay, Alaska, in any calendar year is 55.

(c) The total number of polar bears which may be removed from the natural habitat in Alaska and waters off Alaska, in the area west of a line extending northwest and southeast from Point Lay, Alaska, in any calendar year is 115.

(d) No polar bear less than 28 months of age may be taken.

(e) No female polar bear that is accompanied by a polar bear less than 28 months of age may be taken.

(f) No polar bear may be taken in a den.

(g) Subject to the conditions set forth in paragraph (h) and (i) of this section, the total number of sea otters which may be removed from the natural habitat in Alaska in any calendar year is 3,000.

(h) The total number of sea otters which may be removed from the natural habitat of any colony in any calendar year may not exceed 3.5 percent of the population of that colony.

(i) No sea otter may be taken from any colony which is below its optimum sustainable population or from which sea otters are moving to other areas of natural habitat which they are establishing new colonies.

(j) The total number of Pacific walruses which may be removed from the natural habitat in Alaska and waters off Alaska in any calendar year is 3,000.

(k) The annual limits established by paragraphs (b), (c), (g), (h), and (j) of this section include all polar bears, sea otters, or Pacific walruses that have been removed from the natural habitat during any calendar year as a result of taking for subsistence, handicraft, or clothing purposes, incidental taking, unlawful taking, taking authorized by the Service or the State of Alaska under §§ 18.31 or 18.95(b) pursuant to a permit for scientific research or public display, and all other taking authorized by the laws and regulations of the State of Alaska.

(l) Any person who kills or injures any polar bear, sea otter, or Pacific walrus must immediately make a reasonable effort to retrieve or capture such marine mammal.

(m) No marine mammal taken under this Subpart H or under § 18.31, and no part or product of any such marine mammal, may be transported out of Alaska or the waters off Alaska unless it is first marked, tagged, or otherwise identified in accordance with the laws and regulations of the State of Alaska, and any such mark, tag, or identification shall remain on such marine mammal, or part or product thereof, until completion of any tanning, taxidermy work, or other processing.

(n) Whenever 80 percent of an annual limit established by paragraph (b), (c), (g), (h), or (j) of this section is reached, the State of Alaska must immediately so inform the Director pursuant to § 18.57. After notifying the Director, the State of Alaska must take all necessary measures to insure that such annual limit is not exceeded. If the Director determines that the State of Alaska has not insured that the annual limit will not be exceeded, he may, by regulation, prohibit any further taking during the calendar year in question or repeal this Subpart H and thereby reimpose the moratorium on taking established by section 101(a) of the Act, 16 U.S.C. 1371(a).

(o) Whenever the Director determines that any taking of polar bears, sea otters, or Pacific walruses is not consistent with the Act, this Subpart H, or any other regulation issued under the Act, he shall take all appropriate action to terminate such taking, including, if necessary, issuance of regulations to repeal this Subpart H and thereby reimpose the moratorium on taking established by section 101(a) of the Act, 16 U.S.C. 1371(a).

(p) If the Director does not receive from the State of Alaska within 120 days after the close of the first full calendar year following the effective date of this Subpart H an annual report submitted under § 18.56(b) which contains the findings and data of a workshop held to obtain and analyze data on polar bears, sea otters, and Pacific walruses, he may, by regulation, repeal this Subpart H and thereby reimpose the moratorium on taking established by section 101(a) of the Act, 16 U.S.C. 1371(a).

§ 18.95 Permits.

(a) Any taking allowed by this Subpart H must be authorized in writing by the State of Alaska.

(b) In addition to licenses or permits referred to in paragraph (a) of this section, the State of Alaska, in accordance with the provisions of a general permit for scientific research or public display issued to the State under § 18.31, may assign to qualified persons permits for scientific research or public display.

[FR Doc. 79-959 Filed 1-10-79; 8:45 am]

Appendix D

Proposed special regulations limiting

public entry and use,

Merritt Island National Wildlife Refuge, Fla.

Federal Register, volume 43, number 125, pages 28017-28018,

Wednesday, June 28, 1978 (43 F.R. 28017-28018)

[4310-55]

[50 CFR Part 26]

PUBLIC ENTRY AND USE

Merritt Island National Wildlife Refuge, Florida

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed special regulations.

SUMMARY: The Service proposes to restrict boat speeds in two locations within the boundaries of Merritt Island National Wildlife Refuge to protect the endangered Florida Manatee (*Trichechus manatus*). Research has shown that boat related accidents are responsible for 25 percent of those manatee mortalities where cause of death could be determined. These regulations would provide protection for the endangered Florida Manatee.

DATE: Comments on this proposed rulemaking will be accepted until July 28, 1978.

ADDRESS: Send comments to: Donald J. Hankla, Area Manager, U.S. Fish and Wildlife Service, 900 San Marco Boulevard, Jacksonville, Fla. 32207, telephone 904-791-2267.

FOR FURTHER INFORMATION CONTACT:

Stephen R. Vehrs, Refuge Manager, Merritt Island National Wildlife Refuge, P.O. Box 65404, Titusville, Fla. 32780, telephone 305-867-4820.

SUPPLEMENTARY INFORMATION: The primary author of this document is Stephen R. Vehrs.

BACKGROUND

Most of the waters within Merritt Island National Wildlife Refuge have been designated as critical habitat for the endangered Florida Manatee. Research by the U.S. Fish and Wildlife Service has shown that boat-related accidents are responsible for 25 percent of those manatee mortalities where cause of death could be determined. Therefore, to reduce manatee mortality due to collision with boats or boat propellers, boat speed will be regulated to "slow speed/minimum wake" on Merritt Island National Wildlife Refuge in two separate locations where manatees may be confined to small areas or where high concentrations of manatees occur. These two areas are locally known as "Haulover Canal" and "Hanger AF Turnbasin and Channel." The restricted zone in each location is approximately 10,000 feet in length. Maps delineating the restricted areas are available at the refuge headquarters and from the office of the Regional Director, U.S. Fish and Wildlife Service, P.O. Box 95067, Atlanta, Ga. 30347. Both restricted areas will be conspicuously posted with signs which read "WARNING MANATEE AREA SLOW SPEED/MINIMUM WAKE." Boating shall otherwise be in accordance with all applicable State and Federal regulations.

The provisions of this proposed special regulation supplement the regulations which cover boating on national wildlife refuge areas which are set forth in title 50, Code of Federal Regulations, part 27.32. Part 27 of 50 CFR provides that U.S. Coast Guard Regulations, titles 33 and 46 CFR are also applicable on navigable waters. As provided by 50 CFR 26.34 the Service hereby proposes the following special regulations:

§ 26.34 Special regulations concerning public access, use, and recreation for individual national wildlife refuges.

FLORIDA

MERRITT ISLAND NATIONAL WILDLIFE REFUGE

Boat speed is limited to "slow speed/minimum wake" in two areas locally known as "Haulover Canal" and "Hanger AF Turnbasin and Channel." The restricted zone in each location is approximately 10,000 feet in length. These areas will be posted with signs which read. "WARNING MANATEE AREAS SLOW SPEED/MINIMUM WAKE." In addition all boating is subject to the regulations in 50 CFR 27.32.

NOTE.—The U.S. Fish and Wildlife Service has determined that this document does not contain a major proposal which would require the preparation of an economic impact statement under Executive Order 11949 and OMB Circular A-107.

Dated: June 16, 1978.

DONALD J. HANKLA,
Area Manager.

[FR Doc. 78-17856 Filed 6-27-78; 8:45 am]

Appendix E

Final special regulations limiting

public entry and use,

Merritt Island National Wildlife Refuge, Fla.

Federal Register, volume 43, number 203, pages 48648-48649,

Thursday, October 19, 1978 (43 F.R. 48648-48649)

[4310-55-M]

Title 50—Wildlife and Fisheries

CHAPTER I—U.S. FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR

PART 26—PUBLIC ENTRY AND USE

Merritt Island National Wildlife Refuge, Fla.

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: This rule establishes regulations to restrict boat speeds in two locations within the boundaries of Merritt Island National Wildlife Refuge to protect the endangered West Indian Manatee (*Trichechus manatus*). Research has shown that boat-related accidents are responsible for 34 percent of the manatee mortalities where cause of death could be determined. These regulations will protect manatees in heavily traveled boat channels.

EFFECTIVE DATES: Effective November 20, 1978 through December 31, 1979.

ADDRESS: Send comments to: Donald J. Hankla, Area Manager, U.S. Fish and Wildlife Service, 900 San Marco Boulevard, Jacksonville, Fla. 32207, telephone 904-791-2267.

FOR FURTHER INFORMATION CONTACT:

Stephen R. Vehrs, Refuge Manager, Merritt Island National Wildlife Refuge, P.O. Box 6504, Titusville, Fla. 32780, telephone 305-867-4820.

SUPPLEMENTARY INFORMATION: The primary author of this document is Stephen R. Vehrs.

BACKGROUND

Most of the waters within Merritt Island National Wildlife Refuge have been designated as critical habitat for the endangered West Indian Manatee. Research by the U.S. Fish and Wildlife Service has shown that boat-related accidents are responsible for 34 percent of those manatee mortalities where cause of death could be determined. Therefore, to reduce manatee mortality from collision with boats or boat propellers, boat speed will be regulated to "Minimum Wake/Slow-Speed" on Merritt Island National Wildlife Refuge in two separate locations where there is a high probability of boat-manatee collision. These two areas are locally known as "Haulover Canal" and "Hangar AF Turnbasin and Channel." The restricted zone in each location is approximately 10,000 feet in length. Maps delineating the

restricted areas are available at the Refuge headquarters. Both restricted areas will be conspicuously posted with signs which read "Warning Manatee Area" "Minimum Wake/Slow-Speed". Boating shall otherwise be in accordance with all applicable State and Federal regulations.

The provisions for these special regulations supplement the regulations which cover boating on National Wildlife Refuge areas which are set forth in Title 50, Code of Federal Regulations, § 27.32. Part 27 of 50 CFR provides that U.S. Coast Guard Regulations, Titles 33 and 46 CFR are also applicable on navigable waters.

SUMMARY OF PUBLIC COMMENT AND SERVICE RESPONSES

On June 27, 1978 (FR Doc. 78-17956) proposed special regulations were published restricting boat speeds on Merritt Island National Wildlife Refuge. Comments were received from two agencies and four individuals. All comments supported the proposed regulations. Two individuals suggested more restrictive regulations.

The National Fish and Wildlife Laboratory suggested using the common name West Indian Manatee instead of Florida Manatee. The laboratory also suggested changing the mortality statistics to reflect more recent figures. Both of these changes are implemented in this final rule.

The Marine Mammal Commission quoted the more accurate mortality statistics and suggested adding a definition for Minimum Wake/Slow-Speed. These changes have also been made.

As provided by 50 CFR 26.34 the Service hereby issues the following special regulations:

§ 26.34 Special regulations concerning public access, use, and recreation for individual national wildlife refuges.

FLORIDA

MERRITT ISLAND NATIONAL WILDLIFE REFUGE

Boat speed is limited to "Minimum Wake/Slow-Speed" in two areas locally known as "Haulover Canal" and "Hanger AF Turnbasin and Channel". The restricted zone in each location is approximately 10,000 feet in length. These areas will be posted with signs which read, "Warning Manatee Area" "Minimum Wake/Slow-Speed". In addition all boating is subject to the regulations in 50 CFR 27.32.

For the purposes of this regulation the term "Minimum Wake/Slow-Speed" is defined as that speed which permits good steerage but produces little or no wake. Boats that are "planing" are not at slow speed. A boat that is not planing, but is "squatting" is not making a minimum wake. A boat that has slowed enough to level out is making "minimum wake".

NOTE.—The U.S. Fish and Wildlife Service has determined that this document does not contain a major proposal which would require the preparation of an economic impact statement under executive order 11949 and OMB Circular A-107.

Dated: October 6, 1978.

DONALD J. HANKLA,
Area Manager.

[FR Doc. 78-29464 Filed 10-18-78; 8:45 am]

Appendix F

Proposed rule to provide for

the establishment of manatee protection areas

Federal Register, volume 44, number 16, pages 4745-4747,

Tuesday, January 23, 1979 (44 F.R. 4745-4747)

[4310-55-M]

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[50 CFR Part 17]

ENDANGERED AND THREATENED WILDLIFE AND PLANTS

Proposed Rulemaking To Provide for the Establishment of Manatee Protection Areas

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed Rulemaking.

SUMMARY: The Service proposes to provide a means for the Director to establish manatee protection areas. Within these areas certain waterborne activities, such as boating and swimming, would be restricted or prohibited.

Research conducted by the National Fish and Wildlife Laboratory of the U.S. Fish and Wildlife Service and the University of Miami indicate that human activities, such as the operation of motor boats and swimming, in areas where manatees may congregate are a significant cause of manatee injuries and deaths. Any areas established under the proposed rules, if finalized, would reduce the incidence of manatee injuries and deaths by using the provisions of the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973 to lessen the likelihood that manatees will encounter boats and people.

DATES: Public comment on this proposed rulemaking is invited. To be considered, comments must be received by February 22, 1979.

ADDRESSES: Comments should be submitted to the Director (FWS/LE), U.S. Fish and Wildlife Service, P.O. Box 19183, Washington, D.C. 20036. Comments should include the file number, REG 17-02-76. Comments and materials received will be available for public inspection during normal business hours at the Service's Division of Law Enforcement, Suite 600, 1612 K Street, NW., Washington, D.C. 20006

FOR FURTHER INFORMATION CONTACT:

Mr. Marshall L. Stinnett, Special Agent in Charge, Branch of Regulations and Penalties, Division of Law Enforcement, Fish and Wildlife Service, Suite 600, 1612 K Street, NW., Washington, D.C. 20006, 202-343-9237.

SUPPLEMENTARY INFORMATION:

BACKGROUND

The West Indian manatee, *Trichechus manatus*, is a protected marine mammal which has also been listed as an Endangered species. The only sizeable manatee population in the United States inhabits inland and coastal waters of the State of Florida. During warmer months some of the animals move into coastal waters of neighboring states. Currently available data suggests there is a manatee population in Florida of between 800 and 1,000. Available population estimates have been evaluated in light of the known level of manatee mortality in Florida, based on information gathered by the National Fish and Wildlife Laboratory of the U.S. Fish and Wildlife Service, and the University of Miami. Estimates indicate that the population is undergoing a serious decline. The high rate of mortality could also indicate a larger population than has been assumed. Until better data are available, however, it is prudent to base management policies on the most conservative estimates of population size.

Results of the cooperative manatee salvage and mortality study conducted by the University of Miami and the National Fish and Wildlife Laboratory of the U.S. Fish and Wildlife Service indicate that human activities are by far the greatest identifiable cause of manatee mortality in Florida. More than 50 percent of human-caused deaths investigated during the salvage program were attributed to boat or barge collisions. Furthermore, a high percentage of living manatees bear wounds and deformities caused by propellers. Additional human-related causes of manatee mortality are the tangling of manatees in nets and discarded fishing lines, and the harassment of manatees by apparently well-meaning, as well as vandalous, swimmers and divers. Such harassment will often force manatees away from warm springs and into colder water, where they become stressed and are more prone to disease. Harassment also causes disruption of the relationship between females and their nursing calves.

The major source of the above information is Brownell, Robert L., Jr., Katherine Ralls, and Randal R. Reeves (editors), *Report of the West Indian Manatee Workshop*, Orlando, Florida, March 27-29, 1978, 37 pp.

EFFECT OF THE RULEMAKING

The problem of manatee mortality caused by people and their activity was one of the concerns of Congress when it passed the Marine Mammal Protection Act of 1972. House Report 92-707 states that "* * * H.R. 10420 would provide the Secretary of the Interior with adequate authority to regulate or even to forbid the use of power boats where manatees are found * * *" (H.R. Rep. No. 707, 92d Cong., 2d Sess. 17-18 (1972)).

The proposed regulations are intended to exercise this authority. They would allow the Director to establish areas of water under the jurisdiction of the United States, both inland and coastal, within which certain waterborne activities would be restricted or prohibited. Such restrictions could include limits on the speed of boats, as well as other restrictions on activities such as boating, swimming, fishing, water skiing, and skin and scuba diving. The purpose of the regulations, the protection of manatees, is stated in § 17.100.

Section 17.101, Scope, explains that the subpart applies to the West Indian manatee (*Trichechus manatus*). Section 17.102 defines the terms "manatee sanctuary," "manatee refuge," "manatee protection area," "waterborne activity," and "water vehicle." These terms are all crucial to the establishment of areas within which manatees can be protected from harmful interaction with people and their activities.

Section 17.103 provides for the actual establishment of manatee protection areas. The Director, by regulations, may establish sanctuaries within which all waterborne activities, such as boating and swimming, would be prohibited. The Director may also establish refuges in which only certain activities would be prohibited or restricted. As an example, within a particular area boat speed could be limited or the number of swimmers allowed in the water at one time could be restricted.

Section 17.104 states the prohibitions applicable to the protection areas. It explains that it is unlawful to engage in any waterborne activity within a manatee sanctuary, or to engage in any waterborne activity in a manner contrary to that permitted within a manatee refuge by regulations applicable to that refuge. This

section also makes it unlawful to engage in any waterborne activity prohibited by or in a manner contrary to that permitted by any State law or regulation the primary purpose of which is the protection of manatees. finally, the section allows an exception to the prohibitions when engaging in any prohibited activity which is reasonably necessary to prevent the loss of life or property due to weather conditions or other reasonably unforseen circumstances.

Section 17.105 provides for the issuance of permits to allow permit holders to engage in activities otherwise prohibited by this subpart.

Emergency establishment of manatee protection areas is provided for in § 17.106. This section would allow the emergency establishment of a protection area if substantial evidence shows there is imminent danger of a taking of one or more manatees.

The final section, § 17.107, is reserved for the listing of designated manatee protection areas.

AUTHORITY

This rulemaking and the establishment of manatee protection areas are authorized by sections 101(a), 102(a)(2), 104, 105, and 112(a) of the Marine Mammal Protection Act of 1972, 86 Stat. 1027 (16 U.S.C. 1371(a), 1372(a)(2), 1374, 1375, and 1382(a)); and by sections 4(d) and (f), 9(a)(1)(G), and 11(a) of the Endangered Species Act of 1973, 87 Stat. 884 (16 U.S.C. §§ 1533(d) and (f), 1538(a)(1)(G), and 1540(a)(1)).

NOTE.—The Service has determined that this roposed rulemaking is not a major Federal action which would significantly affect the quality of the human environment within the meaning of section 102(2)(C) of the National Environmental Policy Act of 1969. The Department has determined that this is not a significant rulemaking and does not require a regulatory analysis under Executive Order 12044 and 43 CFR Part 14.

The primary author of this proposal is Kenneth J. Hirsh, Legal Specialist, Division of Law Enforcement, U.S. Fish and Wildlife Service, 202-343-9237.

REGULATION PROMULGATION

Accordingly, it is hereby proposed to amend Title 50, Chapter I, Subchapter B, Part 17 in the following manner:

1. The table of sections for Part 17 is amended by adding the following, after Subpart J:

* * * * *

Subpart J—Manatee Protection Areas

AUTHORITY: Marine Mammal Protection Act of 1972, 86 Stat. 1027, as amended, §§ 101(a), 102(a)(2), 104, 105, and 112(a) [16 U.S.C. §§ 1371(a), 1372(a)(2), 1374, 1375, and 1382(a)]; Endangered Species Act of 1973, 87 Stat. 884, as amended, §§ 4(d) and (f), 9(a)(1)(G), and 11(a)(1) [16 U.S.C. §§ 1533(d) and (f), 1538(a)(1)(G), and 1540(a)(1)].

2. Part 17 is amended by adding the following new subpart immediately after § 17.95:

* * * * *

Subpart J—Manatee Protection Areas

§ 17.100 Purpose.

This subpart provides a means for establishing areas of water under the jurisdiction of the United States within which certain waterborne activities will be restricted or prohibited for the purpose of preventing the taking of manatees.

§ 17.101 Scope.

This subpart applies to the West Indian manatee (*Trichechus manatus*), also known as the Florida manatee and as the sea cow. The provisions of this subpart are in addition to, and not in lieu of other regulations contained in this subchapter B which may require a permit or prescribe additional restrictions on the importation, exportation, transportation, or taking of wildlife, and the regulations contained in Title 33, Code of Federal Regulations, which regulate the use of navigable waters.

§ 17.102 Definitions.

In addition to definitions contained in the Act and in Part 10 of this subchapter, and unless the context otherwise requires, in this subpart: "Manatee sanctuary" means an area in which the Director has determined that any waterborne activity would result in a taking of one or more manatees, including but not limited to a taking by harassment.

"Manatee refuge" means an area in which the Director has determined that certain waterborne activity would result in the taking of one or more manatees, or that certain waterborne activity must be restricted to prevent the taking of one or more manatees, including but not limited to a taking by harassment.

"Manatee protection area" means a manatee refuge or a manatee sanctuary.

"Waterborne activity" includes, but is not limited to, swimming, diving (including skin and scuba diving), snorkeling, water skiing, surfing, fishing, and the use of water vehicles.

"Water vehicle" includes, but is not limited to, boats (whether powered by engine, wind, or other means), ships (whether powered by engine, wind, or other means), barges, surfboards, water skis, or any other device or mechanism the primary or an incidental purpose of which is locomotion on, across, or underneath the surface of the water.

§ 17.103 Establishment of protection areas.

The Director may, by regulation issued in accordance with 5 U.S.C. 553 and 14 CFR Part 14, establish manatee protection areas whenever there is substantial evidence showing such establishment is necessary to prevent the taking of one or more manatees. Any regulation establishing a manatee protection area shall state the following information:

(a) Whether the area is to be a manatee sanctuary or refuge.

(1) If the area is to be a manatee sanctuary, the regulation shall state that all waterborne activities are prohibited.

(2) If the area is to be a manatee refuge, the regulation shall state which, if any, waterborne activities are prohibited, and it shall state the applicable restrictions, if any, on permitted waterborne activities.

(b) a description of the area sufficient enough so that its location and dimensions can be readily ascertained without resort to means other than published maps, natural or man-made physical reference points, and posted signs.

(c) The dates of the year during which the designation as a protection area shall be in effect.

§ 17.104 Prohibitions.

Except pursuant to a permit issued under the provisions of section 17.105 below,

(a) *Manatee sanctuary.* It is unlawful for any person to engage in any waterborne activity within a manatee sanctuary.

(b) *Manatee refuge.* It is unlawful for any person within a particular manatee refuge to engage in any waterborne activity which has been specifically prohibited within that refuge, or to engage in any waterborne activity in a manner contrary to that permitted by regulation within that area.

(c) *State law.* It is unlawful for any person to engage in any waterborne activity prohibited by, or to engage in any waterborne activity in a manner contrary to that permitted by, any State law or regulation the primary purpose of which is the protection of manatees.

(d) *Exceptions.* Any waterborne activity otherwise prohibited by this section may be engaged in if doing so is reasonably necessary to prevent the loss of life due to weather conditions or other reasonably unforeseen circumstances.

§ 17.105 Permits.

The Director may issue permits allowing the permittee to engage in any activity otherwise prohibited by this subpart. Such permits shall be issued in accordance with the provisions of section 17.22 of this Part 17.

§ 17.106 Emergency establishment of protection areas.

(a) The Director may establish manatee protection area under the provisions of subsections (b) and (c) below at any time he determines there is substantial evidence that there is imminent danger of a taking of one or more manatees, and that such establishment is necessary to prevent such a taking.

(b) The establishment of a manatee protection area under this section shall become effective immediately upon completion of the following requirements:

(1) Publication of a notice containing the information required by § 17.103 above in a newspaper of general circulation in each county, if any, in which the protection area lies; and

(2) Posting of the protection area with signs clearly marking its boundaries.

(c) Simultaneously with the publication required by subsection (b) above, the Director shall publish the same notice in the FEDERAL REGISTER. If simultaneous publication is impractical, because of the time involved or the nature of a particular emergency situation, failure to publish notice in the FEDERAL REGISTER simultaneously shall not delay the effective part of the emergency establishment. In such a case, notice shall be published in the FEDERAL REGISTER as soon as possible.

(d) No emergency establishment of a protection area shall be effective for more than 120 days. Termination of an emergency establishment of a protection area shall be accomplished by publishing notice of the termination in the FEDERAL REGISTER and in a newspaper of general circulation in each county, if any, in which the protection area lies.

§ 17.107 List of designated manatee protection areas [Reserved]

Dated: January 17, 1979.

LYNN A. GREENWALT,
Director,
Fish and Wildlife Service.

[FR Doc. 79-2296 Filed 1-22-79; 8:45 am]

Appendix G

Notice of extension of comment period on

proposed manatee protection area rule

Federal Register, volume 44, number 58, page 17762,

Friday, March 23, 1979 (44 F.R. 17762)

[4310-55-M]

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[50 CFR Part 17]

ENDANGERED AND THREATENED WILDLIFE AND PLANTS

Proposed Rulemaking to Provide for the Establishment of Manatee Protection Areas; Extension of Comment Period

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of Extension of Comment Period for Proposed Rulemaking.

SUMMARY: On January 23, 1979, the Fish and Wildlife Service published a "Proposed Rulemaking to Provide for the Establishment of Manatee Protection Areas" (44 FR, 4745). The proposal provided for a comment period of 30 days, ending February 22, 1979. Several persons and organizations have informed the Service that they wanted to submit comments but were unable to do so by the closing date. In order to allow receipt of these comments, and to provide the Service with a full complement of comments on which to base its decision, the Service is extending the comment period to April 24, 1979.

DATES: Public comment: To be considered, comments must be received by April 24, 1979.

ADDRESSES: Comments should be submitted to the Director (FWS/LE), U.S. Fish and Wildlife Service, P.O. Box 19183, Washington, D.C. 20036. Comments should include the file number, REG 17-02-76. Comments and materials received will be available for public inspection during normal business hours at the Service's Division of Law Enforcement, Suite 600, 1612 K Street, N.W., Washington, D.C.

FOR FURTHER INFORMATION CONTACT:

Mr. Marshall L. Stinnett, Special Agent in Charge, Regulations and Penalties, Division of Law Enforcement, Fish and Wildlife Service, Suite 600, 1612 K Street, N.W., Washington, D.C., 202-343-9237.

Dated: March 19, 1979.

LYNN A. GREENWALT,
Director.

[FR Doc. 79-9082 Filed 3-22-79; 8:45 am]

Appendix H

Proposed rule to list the West African manatee

(Trichechus senegalensis)

as a threatened species

Federal Register, volume 43, number 96, pages 21338-21339,

Wednesday, May 17, 1978 (43 F.R. 21338-21339)

[4310-55]

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[50 CFR Part 17]

ENDANGERED AND THREATENED WILDLIFE AND PLANTS

Proposed Threatened Status for West African Manatee (*Trichechus senegalensis*)

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: The Service proposes that the West African manatee (*Trichechus senegalensis*) be listed as a Threatened species. A petition from the Marine Mammal Commission to list this species contains the data upon which the proposal is based. If the West African Manatee is listed as Threatened, certain measures will go into effect that could benefit the species and result in its restoration.

DATES: Comments from the public must be received by July 17, 1978.

ADDRESSES: Submit comments to Director (OES), U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240.

FOR FURTHER INFORMATION CONTACT:

Mr. Keith M. Schreiner, Associate Director—Federal Assistance, U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240, 202-343-4646.

SUPPLEMENTARY INFORMATION:

BACKGROUND

On November 18, 1977, the Service was petitioned by the Marine Mammal Commission to list the West African manatee as a Threatened species pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531-1543). It is the Service's opinion that the Marine Mammal Commission provided sufficient data to propose this species for Threatened status.

Section 4(a) of the Act states:

> General.—(1) The Secretary shall by regulation determine whether any species is an endangered species or a threatened species because of any of the following factors:
> (1) The present or threatened destruction, modification or curtailment of its habitat or range;
> (2) overutilization for commercial, sporting, scientific or educational purposes;
> (3) disease or predation;
> (4) the inadequacy of existing regulatory mechanisms; or
> (5) other natural or manmade factors affecting its continued existence.

This authority has been delegated to the Director.

SUMMARY OF THE FACTORS AFFECTING THE SPECIES

With the West African manatee, factors (1), (2), (4) and (5) are operational. The appropriate portion of the petition from the Marine Mammal Commission detailing these factors is herewith reproduced:

> The West African manatee is known from the coastal waters and adjacent rivers along the west coast of Africa from the mouth of the Senegal River (16° N), southward to the mouth of the Cuanza River (9° S) in Angola. Its range includes parts of the following countries: Senegal, Gambia, Guinea-Bissau, Upper Volta, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Benin, Mali, Nigeria, Cameroon, Chad, Equatorial Guinea, Gabon, Congo Brazzaville, Cabinda, Zaire, and Angola. Its present range is though to be comparable to its historic range.
>
> "Husar (Mammalian Species, in press) has summarized what is known of the status of this species. No estimates of past or present population size are available. In at least one area, the Niger and Mekrou Rivers along the northern boundary of Benin (formerly Dahomey), it has been exterminated by local hunting (Poche, *Oryx* 12(2): 216-222, 1973). Manatees are taken by guns and harpoons in Liberia and Sierra Leone, where existing protective regulations are routinely ignored (Robinson, *Oryx* 11(2-3): 117-121, 1971). Ritual hunting for manatees still takes place in Ghana (Cansdale, *Oryx* 7(4): 168-171, 1964). In Nigeria, the species has traditionally been hunted by use of grass-baited traps (Dollman, *Nigeria Nat. Hist. Mag.* 4: 1170125, 1933; Allen, *Am. Comm. for Intern. Wildl. Protect.*, Spec. Publ. No. 11, 620 pp., 1942), a practice which continues there "unrestrained" despite legal prohibitions (Sikes, *Oryx* 12(4): 465-470, 1974). Native hunting in Zaire and Angola, on the lower Congo, was said to be reducing the Manatee population (Derscheid, Rev. Zool. *Africaine Bull. Cercle Congolaise* 14 (2): 23031, 1926; Allen *Loc. cit.*) and hunting continued as recently as 1952 (Bouveignes, *Zooleo* 14(4): 237-244, 1952). For most areas, it seems fair to assume that subsistence hunting is, or has been, intense, and that many local stocks are depressed. Fortunately, a large-scale commercial exploitation has never been directed at *T. senegalensis* (Husar, *loc. cit.*).
>
> In addition to direct hunting by natives, other factors may be having a negative

impact on the species. Wood (*Nigerian Field* 6(1): 23-28, 1937) described the way Nigerian fishermen, in 1932, trapped 46 manatees in the Anambra creek system, apparently exterminating them from the sea. The men did it because they regarded the animals as a nuisance to canoe traffic. Manatees are susceptible to accidental drowning in fish nets, particularly those set for sharks; this phenomenon has been documented in Senegal by Cadenat (*Bull. Inst. F. Afr. Noire* 19 A(4): 1358-1383, 1957). The extent of shark netting in West African waters is not known, so its impact on manatees there cannot be assessed (Husar, *loc. cit.*). Likewise, the degree to which manatees are injured by accidental collisions with motorboats in West Africa is unknown (Husar, *loc. cit.*); experience in Florida with *T. manatus* (Hartman, PhD Thesis, Cornell University, 1971) suggests that it could contribute substantially to mortality in heavily trafficked areas.

The West African manatee is currently protected under Class A of the African Convention for the Conservation of Nature and Natural Resources, 1969. However, enforcement of this convention is reported to be ineffective (Husar, *loc. cit.*). Some forms of additional legal protection exists in most countries where the West African manatee occurs, but the problems of enforcement and education are seemingly universal. The presence of the species in reserves gives some guarantee of protection (See Howell, *Nigerian Field* 33(4): 32-35, 1968; Dupuy and Verschuren, *Oryx* 14(1): 36-46, 1977). The West African manatee is listed as vulnerable by the IUCN, whose Red Data Book notes that the high value of the meat has been an irresistible incentive for killing. *T. Senegalensis* is also included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

If hunting and habitat modification continue uncontrolled, this species will become more seriously depleted. Damming of rivers and increased boat and ship traffic in many areas may contribute to its decline. Assuming that it is not one already, *T. senegalensis* is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Therefore, the Commission recomends that it be classified as 'threatened' under the Endangered Species Act of 1973, until more is known about it status.

Effects of the Rulemaking

The West African manatee is already protected by the Marine Mammal Protection Act. (16 U.S.C. 1362 (5)-(6); 50 CFR 18.3). Among other things, that Act imposes significant restrictions on importation of the species into the United States. (16 U.S.C. 1371(a), 1372(b)-(c); 50 CFR 18.12). Listing the manatee as a Threatened species under the Endangered Species Act would not only provide an additional prohibition against importation, but would also restrict transportation or sale in interstate or foreign commerce. (16 U.S.C. 1533(d), 1538(a)(1)(G); 50 CFR 17.31(a)). Under each Act, permits are available in certain instances for scientific and zoological display purposes. (16 U.S.C. 1371(a)(1), 1372(b), 1374(c); 50 CFR 17.32, 18.31).

Listing of the West African manatee as Threatened would allow the United States to try to: (1) make the countries in which it is resident aware of the importance of manatee protection; (2) make available to scientists of other countries the results of manatee research undertaken under U.S. sponsorship in such form as to be helpful to them in developing their own research plans; (3) encourage other countries to undertake comprehensive surveys of the status and distribution of this species; (4) encourage other countries to establish reserves; (5) encourage reintroductions to areas once they are well established as protected habitat; and (6) encourage the acquisition of study specimens, that might not otherwise be available, for purposes of scientific research of animals taken incidental to net fisheries.

Public Comments Solicited

The Director intends that the rules finally adopted will be as accurate and effective in the conservation of any Endangered or Threatened species as possible. Therefore, any comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, private interests or any other interested party concerning this proposed rulemaking are welcome. Comments particularly are sought concerning:

(1) Abundance and distribution of the species; and

(2) population trends.

Final promulgation of the regulations on the West African manatee will take into consideration the comments and any additional information received by the Director and such communications may lead him to adopt final regulations which differ from this proposal. An environmental assessment is being prepared in conjunction with this proposal. When completed it will be on file in the Service's Office of Endangered Species, 1612 K Street NW., Washington, D.C. 20240, and may be examined during regular business hours or can be obtained by mail. A determination will be made at the time of final rulemaking as to whether this is a major Federal action which would significantly affect the quality of the human environment within the meaning of Section 102(2)(C) of the National Environmental Policy Act of 1969.

The primary author of this proposed rulemaking is John L. Paradiso, Office of Endangered Species, 202-343-7814.

Regulations Promulgation

Accordingly, it is proposed to amend Part 17, Subpart B, Chapter I of Title 50 of the U.S. Code of Federal Regulations as follows:

Amend § 17.11 by adding in alphabetical order under "Mammals" the following to the List of Endangered and Threatened Wildlife and Plants:

§ 17.11 Endangered and threatened wildlife.

Species		Population	Range		Status	When listed	Special rules
Common name	Scientific name		Known distribution	Portion threatened			
West African manatee.	*Trichechus senegalensis*	N/A	West Coast of Africa	Entire	T		None

Note: The Service has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Order 11949 and OMB Circular A-107.

Dated: May 9, 1978.

Robert S. Cook,
Acting Director,
Fish and Wildlife Service.

[FR Doc. 78-13422 Filed 5-16-78; 8:45 am]

* U. S. GOVERNMENT PRINTING OFFICE : 1979 O - 303-815