Supplemental

Environmental Impact Statement

PROPOSED DESIGNATION OF CRITICAL HABITAT FOR THE HAWAIIAN MONK SEAL IN THE NORTHWESTERN HAWAIIAN ISLANDS

U.S. DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

National Marine Fisheries Service

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Washington, D.C. 20230

OFFICE OF THE ADMINISTRATOR

Dear Reviewer:

In accordance with the provisions of the National Environmental Policy Act of 1969, we enclose for your review our supplemental environmental impact statement (SEIS) on the Proposed Designation of Critical Habitat for the Hawaiian Monk Seal (Monachus schauinslandi) in the Northwestern Hawaiian Islands.

The National Marine Fisheries Service is proposing to designate critical habitat for the Hawaiian monk seal pursuant to the Endangered Species Act of 1973. The designation will provide protection to the portion of the monk seal's habitat that is essential for the survival of the species. The SEIS contains information on the biology and habitat usage of the monk seal that has been developed since the Draft Environmental Impact Statement on Designation of Critical Habitat was published in March 1980. The preferred alternative presented in the SEIS is the designation of all beach areas, lagoon waters, and ocean waters out to a depth of 10 fathoms around Kure Atoll, Midway Islands (except Sand Island), Pearl and Hermes Reef, Lisianski Island, Laysan Island, French Frigate Shoals, Gardner Pinnacles, Necker Island, and Nihoa Island.

Any written comments or questions you may have should be submitted to the official identified below by February 15, 1985. Also, one copy of your comments should be sent to me in Room 6111, PP2, U.S. Department of Commerce, Washington, D.C. 20230.

Contact Person:

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Thank you.

Sincerely,

David Collingham
for

Joyce M. T. Wood
Chief
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Enclosure

PROPOSED DESIGNATION OF CRITICAL HABITAT FOR THE
HAWAIIAN MONK SEAL (MONACHUS SCHAUINSLANDI)
IN THE NORTHWESTERN HAWAIIAN ISLANDS

(X) Supplemental Environmental Impact Statement

() Final

Responsible Agency: National Marine Fisheries Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce
Washington, D.C. 20235

Responsible Official: William G. Gordon
Assistant Administrator for Fisheries

Abstract: The National Marine Fisheries Service is proposing to designate critical habitat for the Hawaiian monk seal in the Northwestern Hawaiian Islands. The designation will provide protection to the portion of the monk seals' habitat that is essential for the survival of the species. The Supplemental Environmental Impact Statement (SEIS) contains information on the biology of the monk seal and its use of habitat that has been developed since the Draft Environmental Impact Statement on designation of critical habitat was published in March 1980. The preferred alternative presented in the SEIS is the designation of all beach areas, lagoon waters, and ocean waters out to a depth of 10 fathoms around Kure Atoll, Midway Islands (except Sand Island), Pearl and Hermes Reef, Lisianski Island, Laysan Island, French Frigate Shoals, Gardner Pinnacles, Necker Island, and Nihoa Island.

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Deadline for Comments: February 15, 1985

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SUMMARY

A. Objective

The objective of this document is to supplement the Draft Environmental Impact Statement on Proposed Designation of Critical Habitat for The Hawaiian Monk Seal in The Northwestern Hawaiian Islands (DEIS, Published February 1980) with new biological information, a revised preferred alternative, and clarification of the benefits and impacts that are likely to result from the designation. The proposal is based on a determination that designating critical habitat will benefit the Hawaiian monk seal (Monachus schauinslandi) by protecting habitat essential for the survival and recovery of the species. The designation would require Federal agencies to evaluate their activities with respect to critical habitat in the Northwestern Hawaiian Islands (NWHI) and consult with the National Marine Fisheries Service (NMFS) pursuant to Section 7 of the Endangered Species Act (ESA) prior to engaging in any action which may affect critical habitat. Currently, Federal agencies operating in the NWHI are required to consult with the NMFS regarding projects and activities they permit, fund, or otherwise carry out that may affect the Hawaiian monk seal. These consultations are required so that the NMFS may assist those Federal agencies in ensuring that their activities are not likely to jeopardize the continued existence of the Hawaiian monk seal and, when necessary, in developing reasonable and prudent alternatives to projects or activities that will ensure the continued existence of the Hawaiian monk seal. Designating critical habitat will assist those Federal agencies in evaluating the potential effects of their actions and in determining when consultation with the NMFS would be appropriate.

Since the DEIS was published, new biological information on the Hawaiian monk seal has been developed allowing a more precise delineation of monk seal habitat requirements. That information and new developments in fisheries, ocean resources, and Federal activities in the NWHI will be summarized in this document.

Reviewers are requested to consider the evidence presented, and any other information available to them and provide comments and recommendations regarding the proposed action. All such recommendations will be considered by the NMFS in reaching a final decision.

B. Proposed action and alternatives

Essential habitat requirements for the Hawaiian monk seal, based on the best available information, have been identified to include pupping and hauling beaches, shallow protected lagoon waters adjacent to those beaches, the deeper inner reef waters, and other surrounding water areas.

1. Proposed action. The NMFS proposes to designate all beach areas, lagoon waters and ocean waters out to a depth of 10 fathoms around Kure Atoll, Midway Island (except Sand Island), Pearl and Hermes Reef, Lisianski Island, Laysan Island, French Frigate Shoals, Gardner Pinnacles, Necker Island and Nihoa Island as critical habitat pursuant to the ESA. (See Maps Appendix 1)

2. Alternative one. Designate all beach areas, lagoon waters and ocean waters out to depth of 20 fathoms around Kure Atoll, Midway Islands, Pearl and Hermes Reef, Lisianski Island, Laysan Island, French Frigate Shoals, Gardner Pinnacles, Necker Island, and Nihoa Island as critical habitat pursuant to the ESA.

3. Alternative two. Designate all beach areas, lagoon waters, and ocean waters out to a distance of 3 nautical miles around the barrier reefs or land

masses of Kure Atoll, Midway Islands, Pearl and Hermes Reef, Lisianski Island, Laysan Island, Gardner Pinnacles, French Frigate Shoals, Necker Island and Nihoa Island as critical habitat pursuant to the ESA.

4. Alternative three. Designation of all marine habitat as specified in the proposed action and/or alternatives as a Marine Sanctuary under Title III of the Marine Protection, Research and Sanctuaries Act of 1972 (16 U.S.C. 1431-1434).

5. Alternative four. No action. Current Federal and State laws and local ordinances would continue to apply and would be relied upon to protect monk seals and essential habitat.

C. Expected Impacts

Impacts on the environment and expected levels of utilization of resources in the NWHI from the designation of critical habitat for the Hawaiian monk seal are likely to be minimal. The DEIS described many impacts, but most of those result from the listing of the monk seal as endangered and not from the designation of critical habitat. Designation of critical habitat is intended to ensure that Federal agencies do not fund, authorize, or undertake any actions which would adversely modify or destroy habitat which is essential for the conservation of the Hawaiian monk seal. In those instances where Federal activities may affect critical habitat, consultation with the NMFS pursuant to Section 7 of the ESA will be required prior to any Federal agency action. In most instances, consultation would be required even without a critical habitat designation because an action that is likely to affect critical habitat would also affect the species. The major benefit to be derived from the designation is increased protection of habitat afforded by the Section 7 consultation process. Federal agencies will have to consider

the effects their activities may have on habitat in addition to effects on the monk seals.

The proposed action will not have a direct impact on current resource uses in the NWHI. The only direct costs will be those associated with more extensive monitoring of Federal activities by the NMFS and those from administrative actions by Federal agencies resulting from reviews of their activities in the NWHI. The additional costs are expected to be minimal since Federal agencies have to conduct Section 7 consultations for activities that may affect Hawaiian monk seals and/or conform to National Environmental Policy Act (NEPA) requirements for actions that significantly affect the environment.

I. Purpose and need for action

A. Status of the Hawaiian monk seal

Counts of hauled-out seals indicate that the present population has declined over the past two and a half decades. The highest total count for all atolls for 1982 (561) is about 50% of the highest counts made for the years 1957-58 (1206). Since the late 1950's, counts have been made at the atolls almost every year (Table 1). However, these counts do not provide a total population estimate since the proportion of the total included in the count is unknown. How the proportion of hauled-out seals may vary among atolls, seasonally or diurnally, is also unknown (Gilmartin, 1983).

The island counts do show a trend over the past two decades. Of the six atolls used consistently by the monk seals during the late 1950's, only one, French Frigate Shoals, has shown an increase. Beach counts there increased sixfold by 1975, but since then there has been no apparent change. The counts have decreased at the other five atolls. The greatest declines have been at Pearl and Hermes Reef and Midway, where the highest recent counts have

decreased 93% from those made in 1957-58. At Lisianski and Kure, high counts made from 1976 to 1979 have declined 50% and 63%, respectively, from the counts made in 1957-58. The counts at Laysan have decreased about 23% (Gilmartin, 1983).

High totals of 24 and 46 seals have been counted in recent years at Nihoa and Necker Islands, respectively. Although these counts are greater than those made 20 years ago, and although a few pups have been born on these islands in recent years, the limited haul-out area makes it unlikely that the counts will increase significantly above present levels at these two areas (Gilmartin, 1983).

The following paragraphs from the Hawaiian Monk Seal Recovery Plan summarize the current status of the Hawaiian monk seal population.

"...The trend of the Hawaiian monk seal population in the near future seems clear. The low number of adult female seals at Kure, Midway, and Pearl and Hermes Reef are not likely to increase greatly, given the low recruitment. At Laysan and Lisianski Islands, the sex ratio among adults shows a disproportionately large number of males, but the intermediate number of juveniles and subadults suggests these two populations have the potential for some recovery. However, the fact remains that the total count for Kure, Midway, Pearl and Hermes Reef, Lisianski, and Laysan continues to decline.

"Since 1975 the counts at French Frigate Shoals, Necker, and Nihoa have not demonstrated an apparent change even though the French Frigate Shoals counts include a higher proportion of juveniles and subadults than the populations in the area from Laysan west to Kure. Therefore, it is reasonable to expect that without corrective measures, the total number of monk seals will continue to decline and that this trend will be reversed only if there is an increase in the survival rates of juveniles, subadults, and adult females."

B. Regulatory History and Classification of the Species.

The original listing of the Hawaiian monk seal as endangered and a summary of actions leading up to the DEIS are detailed in the DEIS. The Notice of Availability for the Draft Environmental Impact Statement for The Proposed Designation of Critical Habitat for the Hawaiian Monk Seal (Monachus schauinslandi) in the Northwestern Hawaiian Islands was published in the Federal Register by the Environmental Protection Agency (EPA) on March 7, 1980. A public meeting was held in Honolulu, Hawaii, on April 28, 1980, to receive comments on the DEIS. The comment period ended May 14, 1980. A brief summary of the comments received is presented in the Proposed Rulemaking for critical habitat.

Further action regarding critical habitat was deferred by the NMFS pending a review of the DEIS and the proposed alternatives by the Hawaiian Monk Seal Recovery Team and completion of the Recovery Plan for the Hawaiian Monk Seal. The Recovery Team's review was completed on October 9, 1980. Although the Team members differed with respect to the area to be incorporated in the designation of critical habitat, the consensus was to support the designation of critical habitat. The majority favored the 20 fathom option, including Maro Reef, Gardner Pinnacles and Nihoa Island which were not included in the original proposal. The Recovery Plan for the Hawaiian Monk Seal was completed in March 1983 and included the original recommendation of October 1980, and is incorporated by reference.

C. Definition of Critical Habitat

Critical habitat is defined in the ESA as "...the specific areas within the geographical area occupied by the species, at the time it is listed...on which are found those physical or biological features (I) essential to the conservation of the species, and (II) which may require special management

considerations or protection" and "specific areas outside the geographical area occupied by the species at the time it is listed...upon a determination by the Secretary that such areas are essential for the conservation of the species." 16 U.S.C. 1532(5)(A). Critical habitat must be specified to the maximum extent prudent and determinable when a species is proposed for listing and it may be designated for previously listed species.

Requirements which are to be considered in determining critical habitat are set forth in Title 50 Code of Federal Regulations Section 424.12.

The Assistant Administrator shall consider those physiological, behavioral, ecological, and evolutionary requirements essential to the conservation of the species and which may require special management considerations or protection. These requirements include, but are not limited to:

- (1) space for individual and population growth, and for normal behavior;
- (2) food, water, air, light, minerals, or other nutritional or physiological requirements;
- (3) cover or shelter;
- (4) sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and generally,
- (5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of listed species.

Regulations specifying critical habitat must be based on the best available scientific data and to the maximum extent practicable be accompanied by a brief description and evaluation of those activities which may adversely modify such habitat or be affected by such designation. Economic and other relevant impacts of specifying critical habitat must also be considered when designating habitat, and any area may be excluded from a critical habitat

designation if a determination is made that the benefits of the exclusion outweigh the benefits of designation. The only exception to this provision is where the failure to designate such habitat will result in the extinction of the species.

The designation of critical habitat is not equivalent to the establishment of a wilderness area or wildlife sanctuary because there are no automatic restrictions on human activities in an area designated as critical habitat. Critical habitat designation affects only those actions authorized, funded, or carried out by Federal agencies. It provides notification to Federal agencies that a listed species is dependent on a particular area for its continued existence and that any Federal action that may affect that area is subject to the consultation requirements of Section 7 of the ESA. Certain activities such as commercial fisheries that are Federally regulated, scientific research conducted under Federal permits, Federal management of other resources, and military operations may be conducted within an area designated as critical habitat if the authorizing Federal agency determines through the Section 7 consultation process that the activity is not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of critical habitat. Activities that are conducted by State agencies or the private sector without any involvement of the Federal Government may be carried out without being subjected to the Section 7 consultation process.

D. Summary of current and historical management practices

The history of management activities in the NWHI is outlined in the DEIS and the reader should refer to that document for background information. Activities involving the U.S. Navy, the U.S. Coast Guard, the Fish and Wildlife Service (FWS), the Western Pacific Regional Fishery Management

Council, the University of Hawaii, and the State of Hawaii in the NWHI have changed since 1980 and are outlined below.

In the spring of 1982 all Navy base operations at Midway were taken over by a civilian contractor with 200 to 250 employees supervised by six to ten Navy personnel. Except for recreational fishing and boating in the lagoon, the contractors are restricted to Sand Island. Eastern Island is off-limits to all but Navy personnel. Although activities such as pier refurbishment and maintenance dredging have undergone informal consultations under Section 7, the Navy has not requested consultation on routine maintenance activities such as sheet piling installation. A three-party management agreement for fish and wildlife resources at Midway is being developed among the NMFS, the FWS and the U.S. Navy in order to formalize the procedure for evaluation of all Navy activities.

At Kure informal consultations between the Coast Guard and NMFS concerning the off-limits areas on Green Island are continuing. Increased accessibility to habitat by monk seals and protection of habitat are the objectives of this coordination.

Formal consultations between the NMFS and FWS regarding the impact of refuge management activities on Hawaiian monk seals have been conducted. These activities include enforcement, research, fisheries support, habitat manipulation, and wildlife management. It was concluded that these activities, conducted under strict controls and at the level at which they were evaluated (i.e. Special Use Permits, coordination with NMFS, etc.), were not likely to jeopardize the continued existence of the Hawaiian monk seal.

Fishery Management Plans (FMP) for the Spiny Lobster and the Precious Coral are in effect in Hawaiian waters. Both have undergone formal consultation review and were evaluated under Section 7. It was determined that neither the

fishery nor the management measures proposed in the Precious Coral FMP would affect monk seals. As a result of consultations, trap size openings and emergency closure provisions were incorporated into the Spiny Lobster FMP and regulations in order to protect monk seals and monk seal habitat.

The State of Hawaii's Rules, implementing Chapter 195D, Conservation of Aquatic Life, Wildlife and Land Plants were revised on March 22, 1982. The Rules prohibit taking, sale and transport of species listed in Chapter 13-124 which includes the Federal list of species in 50 CFR 17.11. Chapter 195D was amended in 1983 to include aquatic life as distinct from wildlife and land plants. Section 195D-5 also includes a requirement similar to Section 7 of the Act wherein State and Federal agencies are required to insure that activities authorized, funded, or carried out by them do not jeopardize the continued existence of endangered species. However, the statute does not define "jeopardy" or describe how agencies are to comply with this statement, and conforming rules have not yet been promulgated.

The Department of Land and Natural Resources (DLNR), through its Division of Aquatic Resources and Forestry and Wildlife, administers Kure as a state seabird sanctuary. The DLNR controls access to and human activities within the sanctuary.

II. Proposed and Alternative Actions

A. Proposed Action

Designation of beach areas, lagoon waters and all waters out to the 10-fathom isobath around Kure Atoll, Midway Island (excluding Sand Island), Pearl and Hermes Reef, Lisianski Island, Laysan Island, Gardner Pinnacles, French Frigate Shoals, Necker Island and Nihoa Island as critical habitat.

This proposed critical habitat designation would include beach areas utilized by the monk seal for hauling out and pupping on the islands and atolls identified. Beach areas refer to all sand beaches and the vegetation immediately behind these beaches, as well as limestone and lava beaches utilized by monk seals as haul-out grounds and pupping areas.

This proposal also includes the lagoon waters within the atolls of Kure, Midway, Pearl and Hermes Reef and French Frigate Shoals and the inner reef waters of all islands. Inner reef waters are those waters within the fringing or barrier reefs on which surf breaks during normal sea conditions. For Pearl and Hermes Reef and French Frigate Shoals, lagoon waters and inner reef waters would include those waters enclosed by the boundary that follows the outer face of the barrier reef, and where breaks occur in the barrier reef, a line drawn from the outer point to the opposite outer point of the barrier reef spanning the break. Waters seaward of the barrier reef out to a depth of 10 fathoms are included in this proposed action.

This preferred alternative includes the pupping and hauling beaches, waters inhabited by females and young during nursing and post-weaning, some foraging areas, and known marine breeding habitat. The total area included in critical habitat for this option is approximately 367 square nautical miles (1257 km²).

B. Alternative one

Designation of beach areas, lagoon waters, and all waters out to the 20-fathom isobath around Kure Atoll, Midway Island, Pearl and Hermes Reef, Lisianski Island, Laysan Island, Gardner Pinnacles, French Frigate Shoals, Necker Island, and Nihoa Island as critical habitat.

This alternative is identical to the proposed action except for the increase in marine habitat. At the 20-fathom isobath, the area proposed for

critical habitat in this alternative is approximately 1588 square nautical miles (5,447 km²).

The additional habitat incorporated in this alternative would consist primarily of additional foraging habitat.

C. Alternative two

Designate all beach areas, lagoon waters and ocean waters out to a distance of three nautical miles around the barrier reefs of Kure Atoll, Midway Islands, Pearl and Hermes Reef, French Frigate Shoals, and three nautical miles around Lisianski Island, Laysan Island, Gardner Pinnacles, Necker Island and Nihoa Island as critical habitat.

This alternative includes the same type of habitat components as the proposed action and alternative one. However, the total area for this option is 794 square nautical miles (2,723 km²) or intermediate between the proposed action and alternative number one.

D. Alternative three

In cooperation with the NOAA Office of Ocean and Coastal Resources Management and the State of Hawaii, designate all marine waters seaward of the Hawaiian Islands National Wildlife Refuge (HINWR) boundaries, Midway Islands barrier reef, and Kure Atoll barrier reef out to a distance of 3 miles or to depths of 10 or 20 fathoms as a marine sanctuary.

E. Alternative four

No Action

This alternative would maintain the status quo with no delineation of critical habitat. Existing management measures under the Marine Mammal Protection Act and Endangered Species Act regulations, HINWR Regulations, Coast Guard and Navy regulations, and fishery management under the Magnuson Fishery Conservation and Management Act of 1976 would continue.

All Federal activities that may affect the monk seal population would continue to be subject to the Section 7 consultation process. The consultation requirement and prohibitions on "take" are the result of listing the Hawaiian monk seal as endangered and are not due to critical habitat designation.

III. Affected Environment

A. Description of the physical environment

The Hawaiian Archipelago consists of 18 oceanic islands and atolls with the eight major or Main Hawaiian Islands ranging northwest from Hawaii to Kauai and Niihau. From Kauai the ten Northwestern Hawaiian Islands (NWHI), beginning with Nihoa, range to Kure Atoll, a distance of 1,853 km (1,151 nautical miles). Total land area in the NWHI amounts to approximately 4,368 acres (1,768 hectares).

Areas not described in the DEIS are described below.

NIHOA ISLAND (161°55.5'W x 23°3.5'N)

The easternmost of the NWHI, this small volcanic island is located approximately 315 km (170 mi.) west northwest of Kauai. Total land area is approximately 0.68 km² (167.8 acres). Except for a wave cut platform on the south facing shore, the landward edges of the island are truncated by abrupt, steep cliffs.

GARDNER PINNACLES (168°W x 25°N)

Gardner Pinnacles consists of a small volcanic island on the northeastern part of an expansive bank 32 km (20 mi.) wide and 80 km (50 mi.) long with depths ranging from 16 to 73 m (9 to 40 fathoms). The island has an area of 0.02 km² (4.5 acres).

For further information on the NWHI refer to the DEIS and Uchida (1977).

B. Flora and Fauna of the NWHI

A description of the floral and faunal components of the NWHI can be found in the DEIS and can be supplemented by the proceedings of the symposium on the Northwestern Hawaiian Islands (Tripartite studies are available from the University of Hawaii Sea Grant and are incorporated by reference). A short summary of the more important species is provided for information.

The only other endangered or threatened marine species likely to be affected by critical habitat designation is the green sea turtle (Chelonia mydas). The green sea turtle is the most abundant sea turtle throughout the Archipelago. Although green turtles apparently nested throughout the Hawaiian Islands at one time, the only remaining major colonial nesting/breeding site is at French Frigate Shoals, where over 90% of the total nesting activity for the Archipelago occurs (Balazs, 1980). Since green sea turtles use some of the same beaches as monk seals, efforts to protect monk seal habitat will also protect sea turtle habitat.

Important commercial finfish and shellfish species currently harvested in the NWHI include spiny lobster (Panulirus marginatus and P. penicillatus), slipper lobster (Scyllarides squammosus), deep ocean shrimp (Heterocarpus laevis and H. ensifer), sea bass, (Epinephelus quernus), pink, grey and red snappers (Pristipomoides microlepis, Aprion virescens, and Etelis marshi), jacks (Caranx cheilio and C. ignobilis), yellowfin tuna (Thunnus albacares), skipjack tuna (Euthynnus pelamis), wahoo (Acanthocybium solandri), and mahimahi (Coryphaena hippurus).

C. Hawaiian Monk Seal Biology

The genus Monachus consists of three widely separated tropical species of seals: the Mediterranean monk seal, M. monachus; the Caribbean monk seal, M. tropicalis; and the Hawaiian monk seal, M. schauinslandi. Monk seals appear

to be more sensitive to human activities than other phocids, and there have been significant population declines in recent years in all three species. The Caribbean monk seal was last sighted in 1952 and is presumed to be extinct.

During the 19th and early 20th centuries sealers, feather hunters, and guano diggers may have reduced the Hawaiian monk seal population to a point near extinction (Rice, 1964). Although the cessation of sealing and the monk seals' relatively isolated habitat may have saved it from extinction, monk seals were still reported to be very rare in 1912. From 1912 until the beginning of World War II, there was little human activity in most of the monk seals' range (except for Midway), and it is possible that the population recovered somewhat (Bailey, 1952).

There have been recorded sightings and observations of monk seals at most of the NWHI from at least the 19th century. Although some counts of animals are available, the first chain-wide censuses did not begin until 1957 (Table 1).

1. Biology and Life History

The relatively isolated atolls and islands of the NWHI comprise the terrestrial habitat of the Hawaiian monk seal; sandy beaches, backed by vegetation at the beach crest, provide haul out and pupping areas. Shallow, protected waters adjacent to these beaches provide relative safety from sharks and strong wave and surge conditions and an environment where pups learn to swim and feed. These nearshore protected waters are critical for successful rearing and acclimation of pups to the ocean environment (Rice, 1964; DeLong and Brownell, 1977).

Pupping occurs regularly on the islands and islets at French Frigate Shoals, Laysan Island, Lisianski Island, Pearl and Hermes Reef, Kure Atoll and, in the last few years, at Necker and Nihoa Islands. The last two areas probably will not become significant pupping sites because the small cobble beaches and rough lava benches provide only a limited amount of habitat suitable for pupping.

Most pups are born between March and May, but births have been recorded in each month of the year (Gilmartin, pers. com.). Mature female monk seals usually pup every one or two years, the reproductive rate for this species is low compared to other species of seals and sea lions (Kenyon and Rice, 1959; Rice, 1964).

Mothers do not leave their pups to feed during the five to six week nursing period. Pups are born with fine black fur which is shed some weeks later (Wirtz, 1968). They gain many times their birth weight of about 35 lbs. (16 kg) during this short nursing period, and weigh as much as 198 lbs. (90 kg) at weaning. Since the pups lose a great deal of weight after weaning while learning to fend for themselves, the condition of the mother, amount of time spent nursing, and total weight gain of the pup before weaning may be important factors in the survival of pups during their first year. Length at birth is about 39.7 in. (100 cm), and yearlings average about 51.5 in. (130 cm) in length and about 99 lbs. (45 kg) in weight. Adult females measure about 91.3 in. (230 cm) and weigh about 602 lbs. (273 kg), and are usually larger than the males at about 83.4 in. (210 cm) and 381 lbs. (173 kg) (King, 1956; Rice, 1964).

It is not known at what age monk seals of either sex first breed. However, female monk seals have been observed bearing pups by at least age six.

Unlike other seals, Hawaiian monk seals do not congregate in large numbers but haul out individually or in small groups. Reproductive male monk seals do not form harems like some other seals and sea lions, but patrol sections of beach from the water searching for receptive females. Mating has been observed in nearshore and shallow offshore waters (Johnson and Johnson, 1981b; DeLong, Gilmartin, Shallenberger and Naftel in prep).

When at the breeding islands, monk seals feed on octopuses, spiny lobster, eels, bottom fish and reef fish which may indicate that they are opportunistic feeders for the most part (Rice, 1964; NMFS, 1980; MacDonald, 1982; Watson and Peiterson, 1983). These items have been identified from scat (fecal) samples and regurgitated material found on the beach.

Monk seals also lead a pelagic existence when away from the breeding islands for a month or more. The green fur that is apparent on many seals results from algae that grows on the fur which attests to a prolonged period at sea (Kenyon and Rice, 1959). Although the majority of monk seals appear to remain at the island of their birth, some inter-island and inter-atoll movements have been recorded. However, their distribution, destinations, routes, food sources, and causes of the movements when not traveling between islands are not well known (A.M. Johnson, 1979).

Monk seals and elephant seals exhibit a unique type of molt in which the outer layer of epidermis is shed along with the old pelage. However, a pup's pre-weaning molt consists only of the hair. Adult males molt in late summer and winter; adult females usually molt in spring or early summer, or if they have pupped, 4 to 8 weeks after weaning (Kenyon and Rice, 1959; Johnson and Johnson, 1981a).

2. Population Size

The history of counts of hauled out seals between the late 1950's and 1982 and the relationship of those counts to trends in population size are presented in Table 1 and summarized in Section I.A. Since the early 1960's, about 1,000 monk seals have been tagged. However, the re-sighting data are not adequate to provide reliable estimates of population size or mortality.

There is some information on the age and sex composition of the population ashore which may be useful in predicting future trends. However, beach counts do not necessarily reflect the age/sex structure of the population since the composition of these counts varies seasonally. The data through 1978 show that the sex ratio at birth is 1:1 and remains so among juvenile and subadult seals for most atoll populations. Among adults, the ratio of males to females changes from 1:1 at birth to about 1.25:1 based on the total of all counts, but this ratio varies significantly among the atolls and islands. Laysan, Lisianski, and Kure have the highest proportions of males, Pearl and Hermes Reef retains a 1:1 ratio and French Frigate Shoals has fewer males than females (1:1.5).

The ratio of juveniles and subadults to adults was found to vary significantly among atolls, with the lowest ratios at Kure and Pearl and Hermes Reef and the highest ratios at Laysan, Lisianski, and French Frigate Shoals (A.M. Johnson et al., 1982). The numbers of seals in recent counts at Midway, Necker, and Nihoa are too low to provide age composition data. Changes in age composition during the last 25 years are apparent at Pearl and Hermes Reef, one of the three atolls showing the greatest declines. Counts at Pearl and Hermes Reef show no change in the number of adults and averaged 88 from 1964 through 1971; however, the average counts of juveniles and subadults decreased from 40 (1964 through 1968) to 9 (1969 through 1971). By 1975, the

number of adults counted had decreased to an average of 20.5 and the juveniles and subadults to an average of 7.

3. Biological problems

In the spring of 1978, at least 50 monk seals died at Laysan Island. These mortalities may have been caused by ciguatera poisoning (Gilmartin, 1980; Johnson and Johnson 1981). Ciguatoxin is a naturally occurring toxin associated with dinoflagellate blooms in tropical reef systems. Blooms occur at irregular intervals in association with a variety of naturally occurring environmental perturbations. The toxin accumulates in the food chain and is apparently lethal to monk seals. Since the 1978 die-off, total counts of monk seals at Laysan Island have not changed significantly (Gilmartin, 1983).

Other factors affecting reproduction, recruitment and recovery include the following biological elements and human activities. Shark attack is probably a major cause of death for Hawaiian monk seals, particularly younger animals and/or those that are injured; most adults bear large scars (Kenyon and Rice, 1959; Rice, 1964; Wirtz, 1968; DeLong et al., 1976; Taylor and Naftel, 1978). As the die-off at Laysan indicates, some seals may be poisoned by eating fish which concentrate ciguatoxin (Gilmartin et al., 1980; Johnson and Johnson, 1981). Groups of adult males sometimes attack solitary adult and subadult females during attempts to mate with the female which is usually severely injured during such episodes. These attacks also contribute to the mortality rate of adult females and the low overall recruitment rate for monk seals. Adult males attacking pups and juveniles mistaken for breeding females may result in significant mortality at Kure, Lisianski and Laysan (Johnson and Johnson, 1978, 1981; Gilmartin, pers. com.). Entanglement of monk seals in discarded pieces of fishing nets and lines has also been observed and,

although no deaths have been reported from the NWHI, entanglement may be a significant cause of mortality for all age and sex classes (Kenyon and Rice, 1959; Andre and Ittner, 1980; Henderson, 1983). Weaned pups and yearlings may be particularly vulnerable because of their propensity to explore their environment which includes netting, lines, and other debris found on the beaches and in the water. As commercial fishing and other human activities expand outward from the main Hawaiian Islands to the NWHI, interactions between monk seals and humans are expected to increase.

The present ratio of subadults and juveniles to adults in the populations from Laysan west to Kure is low. The ratio of adult females to adult males at Kure, Lisianski, and Laysan is low, as is the total number of adult females at Kure, Midway, and Pearl and Hermes Reef. The reasons for these skewed sex ratios are not known. Even with the increase in counts at French Frigate Shoals, Necker Island, and Nihoa Island, the number of monk seals probably will continue to decline unless corrective measures are implemented. This trend is likely to change only if there is a change in the survival of juveniles, subadults, and adult females.

There has been no known loss of potential pupping habitat since the listing in 1976. In fact, reduction and control of human activities at Kure, Midway, and French Frigate Shoals has made more habitat available to monk seals. Despite this greater accessibility to former pupping sites, monk seals have not appreciably increased or reinitiated pupping activities in these areas.

Pupping has been occurring more frequently on Green Island at Kure Atoll, but may not be sufficient to halt the current downward trend in population at Kure. A headstart program was initiated to enhance the survival of pups at Kure. Unless sufficient recruitment is generated by this program the Kure

population of monk seals is likely to disappear. The NMFS is developing an educational program for personnel on Kure to alleviate the adverse effects of disturbance of hauled out seals. This should contribute to the survival of pups and adults at Kure.

At Midway Islands, the average counts of seals declined about 90 percent between 1958 and 1966. Even with Eastern Island, a major haul-out and pupping area, off-limits to all personnel since 1978, monk seals have shown no signs of recovery at Midway.

In 1979 the U.S. Coast Guard closed its Loran Station at Tern Island, French Frigate Shoals, and the FWS assumed responsibility for management of the facilities at Tern Island. The FWS has minimized the number of people on Tern Island. Counts of seals hauled out on Tern Island have increased from a few solitary animals to over 100 animals since the number of people was reduced. Although the counts have increased substantially, there has not been any pupping on Tern Island. If human activity at French Frigate Shoals and, particularly, Tern Island increases beyond current levels, the potential for expansion of breeding habitat may be compromised.

Because of the limited terrestrial habitat available to the Hawaiian monk seal, any loss of pupping, nursing and haul out areas is critical to the survival of the species. Conversely, any former habitat that can be regained through proper management should aid in the recovery efforts now in progress.

4. Habitat Requirements

Existing data indicate that the beach areas utilized by the Hawaiian monk seal for hauling out and pupping are critical to the well being of the species. This critical area also includes the first line of vegetation (usually Scaevola or Eragrostis spp.) backing these beaches which provides

shelter from wind and other elements. There is further evidence indicating that critical beach areas should also include the lava bench and boulder beach habitat found at Necker and Nihoa Islands. During the April 1977 monk seal survey, 46 seals were censused at Necker Island, including three apparently pregnant females (DeLong and Brownell, 1977). During June 1977, a pup was seen and during August of that year, a weaned pup and the remains of a dead pup were observed (Balazs, pers. com.). In May 1978 a nursing pup and a dead pup were recorded (DeLong, 1978) and in July, a weaned, molted pup was among 30 seals censused (Fiscus, et al., 1978). From 1979 to 1982 the counts at Necker have ranged from a low of 17 to a high of 34 animals. Monk seals have been recorded at Nihoa since 1964, with a high count of 12 in 1979 and averaging just over 8 animals per year from 1980 to 1982 (Table 1).

Shallow protected water immediately adjacent to beaches is also of critical importance to the Hawaiian monk seal. During the April 1977 monk seal survey, it became evident, with the exception of undisturbed dry sand beaches, this nearshore protected water habitat is the most important factor for a successful pupping area. Pregnant females utilize the beaches for pupping apparently to have a protected shallow area in which to take their pups when they first enter the water. This type of habitat exists off the leeward side of Laysan Island and off the windward side of Lisianski Island where the majority of pupping occurs on these two islands. Round Island at French Frigate Shoals is small, low, and unvegetated, but is ringed with the requisite shallow protected water. On April 9, 1977, seven females with nursing pups were censused on this small islet, and 10 or more pups were born there in 1977. In 1978 there were 17 pups present on May 10 (DeLong, 1978).

Monk seals have been observed by divers on the bottom in 10 fathoms or shallower water near anchored vessels at rookery islands. The seals appear to

favor a rugged, broken bottom substrate containing many caves and crevices. They spend time in these coral caves where it has been reported they trap exhaled air against the cave ceilings possibly to be utilized later in order to extend their bottom time (Taylor and Naftel, 1977).

Studies on Laysan Island (Johnson and Johnson, 1978) indicate that, for three months after weaning, pups make daily sorties from the beaches, presumably to feed. They are seen in the water close to shore and it is assumed that the critical stage of learning to feed is carried out in nearshore waters. During the first month the pups lose weight, then stabilize, and finally begin to gain slightly. By four months post-weaning, pups begin spending periods up to 10 days away from the island.

Observations at Laysan Island indicate that immediately upon weaning their pups adult female monk seals leave the island for at least 20 days. They leave in an emaciated condition and return in relatively good condition, stay one to four days on the island, then leave for an additional 20 days before reappearing apparently well nourished (Johnson and Johnson, 1978). Since they do not haul out at Laysan during these two 20-day periods, it is assumed that they are feeding at least beyond the inner reef and probably a considerable distance from shore.

From samples of regurgitated material found on the beaches it is known that monk seals consume spiny lobsters, octopuses, moray eels, and various smaller reef fish. These known prey species are distributed over and within the coral structures from the inner reef waters very near the shore and in the lagoons to offshore waters over the extensive banks surrounding many of the rookery islands, and some distance down the bank slopes which drop off quickly to deep ocean waters beyond 100 fathoms. Diving studies have shown that monk seals are capable of diving to considerable depths. Thus, feeding probably

occurs in the lagoons and in the offshore waters along the bank slopes to the deepest extent of their diving capabilities wherever prey is abundant.

Depth of dive studies have shown that adult male Hawaiian monk seals are capable of diving to at least 120 meters (65.6 fm), and that juvenile and subadult females are able to dive to at least 152 m (83.1 fm) (Schlexer, 1984). In the studies conducted, the majority of dives recorded were in the 0-15 m (8.2 fm) depth range. Based on these data and a review of pinniped diving behavior (Kooyman and Anderson, 1969), it is reasonable to assume that a majority of the dives recorded were for foraging purposes.

In May 1978, a mating of Hawaiian monk seals was observed approximately one kilometer (0.62 miles) off Laysan Island outside the reef in water ranging from about 6 to 12 fathoms (DeLong, unpub. obs.). Another copulation was observed in waters near the beach 5 m (16.4 ft.) off the southwest side of Laysan Island also in May 1978 (Johnson and Johnson, 1981). Additional observations of males mobbing a solitary female during breeding activities are being summarized by DeLong et al. (in press). Mating has never been observed on land; thus, it seems likely that breeding activity occurs in nearshore and shallow offshore waters. Critical habitat delimited by the 10-fathom isobath would include the known breeding habitat, as well as some foraging habitat, for monk seals.

It should be recognized that many of the habitat components for the Hawaiian monk seal such as beach areas, nearshore shallow water areas, and offshore banks and shoals cannot be simply delineated as specific distances along specified beaches or arbitrary distances offshore. Therefore, it is necessary to designate the entire area without piecemeal delineations. For example, monk seals use all of the beaches on Green Island at Kure as hauling areas and the more isolated areas (from human disturbance) for pupping.

Additionally, the various sand spits and islets in the lagoon and atolls of the NWHI used by the monk seal are changing constantly. Depending upon storm and tide conditions these spits and islets grow, shrink, disappear, change shape, and even change location. In some cases new islets appear after storms or strong tide conditions. References to beaches or beach areas in the discussion of alternatives include all of the above.

Based on available information, the following habitat components should be considered essential for the health, well being and continued viability of the Hawaiian monk seal population, in the order of their probable importance.

1. Pupping and major hauling beaches including the vegetation immediately backing the beaches (coral sand beaches and lava benches).
2. Shallow protected water adjacent to the above (tide pools, inner reef waters, shoal areas, and near shore shallows).
3. Deeper inner reef areas, lagoon waters, and all other water areas out to the 10-fathom isobath.

Although monk seals are found over other banks and shoals without emerged land and in pelagic areas, the importance of these areas to this species is not known at this time.

IV. Evaluation of Impacts

A. Framework for Analysis: Current Resource Uses and Management in the NWHI

Sections I.E. (pp. 14-17) and III. 3.2. (pp. 32-38) of the DEIS describe the facilities and management programs of agencies with facilities on the NWHI (there are no private inholdings in the NWHI) and the fishery resources of the NWHI respectively. This section will update that information to establish a

perspective for consideration of the impacts of the proposed action and alternatives.

1. U.S. Coast Guard (USCG). The USCG continues to maintain its LORAN station at Kure. Station Orders for Kure have remained essentially the same as those referenced in the DEIS. The North Point area remains off limits and contact with monk seals on Green Island is kept to a minimum. The NMFS is involved in an informal consultation with the USCG regarding expansion of restricted areas on Kure to provide additional habitat to monk seals for hauling out, pupping, and nursing.

2. U.S. Navy. The U.S. Navy Station at Midway Island is administered by a contractor with a staff of 200-250 civilians. There are about 10 Navy military contract monitors. Access to Spit Islands and Eastern Island is very limited, and disturbance of monk seals is prohibited by Station orders. There are no known plans to modify the base or operations.

3. Fish and Wildlife Service (FWS). Activities within the HINWR such as research, wildlife management, and resource utilization are controlled by the refuge manager per regulations found at Title 50 Code of Federal Regulations, Part 25. Coordination between the FWS and NMFS in the protection and conservation of monk seals is expected to continue.

The FWS is developing a "master plan" for the Hawaiian Islands National Wildlife Refuge (HINWR). This plan will define objectives and outline strategies for the conservation and wise use of resources in the refuge. The FWS also was represented on the monk seal recovery team and is cooperating in implementing the recovery plan. This includes strict controls on access to and use of HINWR resources for research and commercial purposes. The FWS consults with NMFS on any actions which could impact on monk seals or their

habitat, and will consult under Section 7 of the ESA concerning alternatives under its "master plan."

4. State of Hawaii. The Hawaii Division of Aquatic Resources (HDAR), DLNR, administers State laws and regulations to ensure the conservation of protected species including the Hawaiian monk seal. State laws are summarized in Section I.D.

The HDAR is responsible for implementing the 1979 Hawaii Fisheries Development Plan, which identified the NWHI as the area in which expansion of the Hawaii fishing industry would occur. Among the primary impediments to development are the costs associated with transit between the NWHI and the main islands and the potential for adverse interactions between fishery development and endangered and threatened species such as the Hawaiian monk seal. The HDAR position is that development can be pursued in balance with wildlife and habitat preservation in the NWHI.

The HDAR has recently (May 1984) submitted a proposal for a water-based fisheries support operation at French Frigate Shoals that would facilitate multi-fishery operations by catcher vessels and improve their net profits by reducing the cost of transit and increasing available fishing time. The HDAR has indicated that expansion of the NWHI fisheries by single-fishery vessels (e.g. bottomfish, or crustaceans, or pelagic species) is likely to be limited if some kind of support facility is not available. The potential yields in the NWHI, according to HDAR, include between 7 and 17 million pounds of bottomfish, lobster, deep-sea shrimp, bigeye scad ("akule") and mackerel scad ("opelu"). The water-based approach was selected because land based support facilities are likely to be detrimental to monk seals.

The FWS will consider the HDAR proposal in the context of its "master plan" as an element in one of the alternative management strategies. As

noted, the FWS will consult with the NMFS under Section 7 of the ESA in the completion of its master plan. The consultation will include consideration of the extent to which such actions as implementation of the fishing support operation would be likely to jeopardize the continued existence of the Hawaiian monk seal or adversely affect critical habitat.

5. Fisheries. The Western Pacific Regional Fishery Management Council (WPRFMC) has completed, and the NMFS has implemented, a fishery management plan (FMP) for spiny lobster in the NWHI. The FMP includes a provision for emergency closure of the fishery in the event of incidental mortality of Hawaiian monk seals from entanglement in gear or other interaction with the fishery. The Council is developing FMPs for bottomfish and for billfish and associated species, and may develop a FMP for deep-sea shrimp. In each instance, the Council and NMFS will conduct Section 7 consultations to ensure that there will be no jeopardy to Hawaiian monk seals, either directly (e.g. through interaction with fishing operations) or indirectly (e.g. through removal of important food supplies).

There is increasing interest in harvesting the lightly fished resources of the NWHI. Several new, large vessels have moved to Hawaii from depressed fisheries off Alaska and the west coast. These vessels have the capability to fish for a variety of species for several days or weeks before returning to Honolulu to unload their catch and resupply. Among the primary target species are bottomfish (opakapaka, onaga, ehu), reef predators (ulua), and crustaceans (spiny lobster, deep-sea shrimp). It appears that the resource base is sufficient to provide a viable fishery for a number of such vessels, even with long distances between fishing grounds and markets. The establishment of a water-based support facility as proposed by HDAR would provide an additional incentive by reducing fishing and shipping costs for fishing vessels. Whether

catches will be large enough and market prices high enough to make the overall operation profitable is unknown. The initial HDAR proposal concludes that medium-sized (45-50 foot) vessels, using a variety of gears to catch the different types of species available, could increase their net income several times over their income as unsupported vessels.

There has been limited fishing in the NWHI. The spiny lobster fishery has fluctuated from 100,000 pounds in 1979 to a high of about 780,000 pounds in 1981, followed by a drop to about 180,000 pounds in 1982 and 1983. The estimated ex-vessel value of the catch has been about \$3.25 - 3.50 per pound during that period. A dozen vessels are regularly fishing for bottomfish in the NWHI. The Laysan Island - North Hampton Bank is about the farthest a vessel can bottomfish and still remain within reasonable travelling time from the fresh fish market in Honolulu. Also, several vessels are known to be fishing for deep sea shrimp around the main islands and in the NWHI. The amount and value of bottomfish and shrimp catches from the NWHI are unknown.

6. Research. Hawaiian monk seal research will continue, following the recommendations and guidance provided in the Recovery Plan. Green turtle research is also expected to continue at its present level pending completion of a Pacific Sea Turtle Recovery Plan. Although the Tripartite Studies have officially concluded, fisheries resource investigations and baseline trophic studies are expected to continue on a somewhat smaller scale.

7. Other Marine Resource Uses. There is considerable interest in development of Ocean Thermal Energy Conversion (OTEC) technology in Hawaii. However, there are no known plans to test such technology in the area proposed for critical habitat.

There also is potential for mining minerals on the ocean floor of the Hawaiian Islands. A research vessel from the University of Hawaii recently

returned from a research cruise in the NWHI with one and one-half tons of manganese crusts which also contained cobalt and other minerals. The Minerals Management Service, U.S. Department of the Interior, plans to prepare an environmental impact statement for a proposed lease sale of manganese crusts in late 1985. The lease sale area would be in the U.S. 200-mile exclusive economic zone but would not include any area within the HINWR. The NMFS will participate on a joint Federal-State work group on manganese crust mining in Hawaii, and Section 7 consultations that may be necessary.

8. Summary of Current and Prospective Resource Uses. The area proposed for critical habitat is lightly used at this time, and current management programs are likely to continue in the future. The Coast Guard and Navy will continue to operate their respective facilities with little change. The NMFS will maintain close contact with these agencies to identify and resolve any problems concerning the monk seals.

The FWS and NMFS are cooperating in carrying out the Hawaiian monk seal recovery plan. There is close coordination between the agencies to ensure that activities carried out or authorized by the FWS will not adversely affect the Hawaiian monk seal. The NMFS has been participating in development of the HINWR master plan, and Section 7 consultations will be conducted as part of the master plan process.

The HDAR is promoting development of NWHI fisheries. Its proposal for a water-based fishery support operation at French Frigate Shoals is being considered by FWS as a possible element in the master plan for the HINWR. Thus, the proposal will be considered in the Section 7 consultations on the plan.

Fishery management plans are being developed by the Western Pacific Council. To the extent such plans include NWHI fishing resources, the Council

and NMFS should enter into consultations under Section 7 of the ESA to ensure that fishing under the plans is not likely to jeopardize the continued existence of monk seals or result in the destruction or adverse modification of critical habitat. These consultations will continue as needed.

The NMFS is working with the Minerals Management Service in considering the possible lease sale of manganese crusts in the NWHI. Section 7 consultations will be initiated if necessary.

B. Impacts of Critical Habitat Designation

The net effect of designating critical habitat is minimal. Almost every intensive use of marine resources in the area under consideration for critical habitat is subject to some control by Federal agencies through permit, licensing, or activity regulations. These Federal agencies are required to consult with the NMFS under Section 7 to ensure that any activities funded, authorized, or undertaken by them are not likely to jeopardize the continued existence of Hawaiian monk seals. As a practical matter, this includes activities that may affect monk seal habitat, including beaches, waters, and food sources, even though critical habitat has not been designated. Designation of critical habitat will not materially add to the responsibility of Federal agencies in this regard. Designation is not expected to impact directly any current or future resource uses, because Section 7 consultations to protect the monk seal would be carried out regardless.

The following sections describe the proposed and alternative critical habitat areas being considered and the impacts of each.

C. Proposed Action.

Designation of all beach areas, lagoon waters and ocean waters out to depth of 10 fathoms around Kure Atoll, Midway Islands, Pearl and Hermes Reef, Lisianski Island, Laysan Island, French Frigate Shoals, Gardner Pinnacles, Necker Island and Nihoa Island as critical habitat.

Environmental Impacts.

This action will identify areas in the NWHI determined to be essential to the conservation of the Hawaiian monk seal. Federal agencies are required to ensure that activities authorized, funded or otherwise conducted by them do not adversely modify or destroy critical habitat. The Federal agencies affected by critical habitat designation include the U.S. Coast Guard, U.S. Navy, FWS, WPRFMC, and the NMFS. The expected effects of the action are minimal and there probably will be no increase in the number of consultations under Section 7 of the Act.

The benefit provided by designation of critical habitat is the clear notification to Federal agencies and the public of the existence of critical habitat and the boundaries of that habitat and the protection provided for that habitat by the Section 7 consultation process. Designation of critical habitat will have no direct impacts on the water, air, or land or on the cultural or historical resources of the NWHI.

Economic Impacts.

The proposed designation will not have any economic impacts on State or private activities in the NWHI. Federal agencies will continue to engage in Section 7 consultations to determine if the actions they authorize, fund, or carry out are likely to jeopardize the continued existence of Hawaiian monk seals. The scope of the consultation will explicitly extend to critical habitat as well as the seals themselves. This may result in an increase in administrative costs to Federal agencies operating in the NWHI. As a practical matter, habitat issues already are considered in Section 7 consultations. Thus, any increase in administrative costs associated with consultations on activities that may affect critical habitat would be slight.

Designation of critical habitat does not affect State and local government activity or private actions which are not dependent on or limited by Federal authority, permits, or funds.

D. Alternative one.

Designation of all beach areas, lagoon waters and ocean waters out to a depth of 20 fathoms around Kure Atoll, Midway Islands, Pearl and Hermes Reef, Lisianski Island, Laysan Island, French Frigate Shoals, Gardner Pinnacles, Necker Island and Nihoa Island as critical habitat.

Environmental Impacts.

The environmental impacts of this alternative are the same as identified for the proposed action, except for the areal extent of critical habitat.

Economic Impact.

This alternative would not generate any economic impacts to State or private activities in the NWHI. Federal agency actions likely to affect Hawaiian monk seals directly or through habitat modification would be subject to Section 7 consultations as at the present time. The area explicitly considered as critical habitat for the purpose of such consultations would simply be larger than under the proposed action. There may be some increase in administrative costs for Federal agencies involved in consultation on activities that may affect critical habitat. This increase would be slight since activities that affect habitat probably would affect the species and therefore would have to be subjected to Section 7 consultations regardless of the status of critical habitat.

E. Alternative two.

Designation of all beach areas, lagoon waters and ocean waters out to a distance of three nautical miles around the barrier reefs or land masses of Kure Atoll, Midway Islands, Pearl and Hermes Reef, Lisianski Island, Laysan Island, Gardner Pinnacles, French Frigate Shoals, Necker Island and Nihoa Island as critical habitat.

Environmental Impacts.

The environmental impacts of this alternative are the same as identified for the proposed action, except for the areal extent of critical habitat.

Economic Impacts.

This alternative would not generate any economic impacts to State or private activities in the NWHI. Federal agency actions likely to affect Hawaiian monk seals directly or through habitat modification would be subject to Section 7 consultations as at the present time. The area explicitly considered as critical habitat for the purpose of such consultations would simply be larger than under the proposed action. There may be some increase in administrative costs for Federal agencies involved in consultation on activities that may affect critical habitat. This increase would be slight since activities that affect habitat probably would affect the species and therefore would have to be subjected to Section 7 consultations regardless of the status of critical habitat.

F. Alternative three.

Designation of all marine habitat as specified in the proposed action and/or alternatives as a Marine Sanctuary.

Environmental Impacts.

The establishment of a marine sanctuary as described above would not include land areas utilized by Hawaiian monk seals for haul-out, pupping and

nursing and encompasses only foraging and breeding habitat. As in the other alternatives described above, there would be no direct impacts on the air, water, or land, or on the cultural and historical resources of the NWHI. Although this alternative would not directly affect land areas, the impact on marine activities below the mean high water mark (e.g. commercial fishing, construction, energy development, ocean mining, and research) could vary from no impact to new restrictions depending on the terms of the designation document.

Economic Impacts.

The economic impacts of this alternative would depend on the terms of the designation document for the marine sanctuary. For example, a sanctuary designation could prohibit ocean mining but permit fishing, or permit some kinds of fishing (e.g. trolling) and prohibit other kinds (e.g. bottom trawling). It should be noted that activities by private individuals and organizations and State and local governments as well as by Federal agencies could be controlled under this alternative. Also, as a practical matter, establishment of a marine sanctuary would be an administratively cumbersome approach and administrative costs probably would be greater than under the proposed action or alternatives 1 and 2.

G. Alternative four: No Action

Environmental Impacts.

Under the no action alternative the Section 7 consultation process would continue to be focused on the probability of jeopardizing the continued existence of the monk seal population. Habitat would be considered in the consultation process only in the context that degradation of the habitat would adversely affect the monk seal population directly. Lacking official notification of critical habitat parameters, Federally authorized activities

that adversely modify or destroy essential habitat without directly affecting Hawaiian monk seals could be conducted without adequate review under Section 7 of the ESA. This situation is not likely to occur often since separating degradation of habitat from adverse effects on the population is difficult.

Economic Impacts.

Federal agencies would continue to engage in Section 7 consultations to ensure that their activities were not likely to jeopardize the continued existence of monk seals. The scope of the consultations would be limited to potential effect on the animals. No economic impacts would be derived from this alternative.

V. Unavoidable Adverse Environmental Impacts of the Proposed Action

There would be no unavoidable adverse environmental impacts from the designation of critical habitat. However, this action would add a limited amount of work to the planning and implementation of activities by Federal agencies by requiring them to consider Hawaiian monk seal habitat relative to their actions in the designated critical habitat areas. The same considerations for actions affecting the environment are required under the National Environmental Policy Act (NEPA) of 1969; therefore it appears that relatively little extra work would be needed to satisfy the requirements of Section 7 of the Act. The requirements of Section 7 would remain, whether or not critical habitat were designated.

VI. Relationship Between Short Term Use of Man's Environment and Maintenance and Enhancement of Long Term Productivity

This action will enhance the long term productivity of these areas by requiring Federal agencies to ensure that their actions will not result in the adverse modification or destruction of critical habitat for the monk seal.

The biological impacts of designating critical habitat may be beneficial to the reef ecosystem and associated marine life since efforts to conserve monk seal habitat will likely result in conservation of other resources.

We do not foresee any significant changes in present short term uses of the areas proposed for critical habitat. Possible future uses which may have to be evaluated under Section 7 of the Act include: (1) construction activities of the Coast Guard on Green Island at Kure Atoll, the Navy on Sand Island at Midway Islands, and the FWS on Tern Island at French Frigate Shoals; (2) deep ocean mining; (3) ocean dumping of wastes and chemicals; (4) federally funded, or controlled fishing activities; and (5) fisheries and wildlife research conducted, funded, supported, or controlled by Federal agencies in the NWHI.

VII. Irreversible and Irretrievable Commitments of Resources

This action is intended to maintain and/or enhance rather than to utilize a resource. There are no actions proposed that could not be modified or reversed by future legal or regulatory action.

VIII. List of preparers

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IX. List of agencies and individuals to whom copies sent

Comments on the supplemental environmental impact statement are solicited from the following Federal agencies, congressional offices, state and local governments, and selected individuals and organizations.

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Figure 1. Hawaiian Archipelago

Figure 3. Cross-Section of an Atoll. After Wells, GSA, 1957.
 (vertical exaggeration - 6 times)
 (from Characteristics of Coral and Coral Dredging, 1978.
 Texas A & M University, Sea Grant College Program.)

Figure 4

Figure 5

Figure 6

PEARL and HERMES REEF

Figure 7

Figure 8

FRENCH FRIGATE SHOALS

(from U.S.F.W.S.)

Figure 9

(from NOS chart 19421)

GARDNER PINNACLES

Figure 10

(from NOS chart 19016)

NECKER ISLAND

Figure 11

Table 1. -- Continued.

Year and reference	Nihoa Island	Necker Island	French Frigate Shoals	Gardner Pinnacles	Laysan Island	Lisianski Island	Pearl and Hermes Reef	Midway	Kure Atoll	Total
1976 ¹¹	--	--	269	--	236	126	30	1	32	694
1977 Apr. ¹²	--	46	223	--	178	106	43	5	24	625
1978 May ¹³	0	22	199	--	--	86	--	--	--	--
1978 Jul. ¹⁴	4	30	196	--	113	85	26	3	45	502
1979 May ¹⁵	12	34	241	--	107	96	28	3	41	562
1980 May-Jun. ¹⁶	8	21	258	--	120	84	27	0	18	536
1981 May ¹⁷	9	17	222	--	86	88	41	5	28	496
1982 ¹⁸	8	24	297	6	90	81	29	2	24	561

Legend:

1. Highest count: various aerial and surface counts made (Kenyon and Rice 1959).
2. Highest Count: various aerial and surface counts made (Rice 1960).
3. Surface counts (Kridler letter 1966).
4. Surface counts.
5. Incomplete counts.

Legend: -- Continued

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18. From counts March-August 1982. Indicated are the means where more than one was performed. W.G. Gilmartin, NMFS, Honolulu.

(From Gilmartin, 1983)

TABLE 2

Areal Extent in Square Nautical Miles for Each Option Under Consideration
for Critical Habitat

<u>Island or Reef</u>	<u>0-10 fathoms</u>	<u>0-20 fathoms</u>	<u>0-3 miles</u>
Nihoa Island	0.2	2.5	34.2
Necker Island	0.6	334.8	32.5
French Frigate Shoals	138.9	220.5	141.4
Gardner Pinnacles	0.1	391.5	28.26
Laysan Island	9.5	133.2	41.2
Lisianski Island	63.0	303.2	35.9
Pearl and Hermes Reef	119.7	143.3	298.6
Midway Island	19.6 (lagoon)	33.8	98.5
Kure Island	15.3 (lagoon)	25.0	83.3
	<hr/>	<hr/>	<hr/>
TOTAL	366.9	1587.8	793.9

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