

FILE COPY

FINAL ENVIRONMENTAL ASSESSMENT  
FOR THE PROPOSED

REFUGE LOGISTICS AND OPERATIONS SUPPORT  
AND PUBLIC USE PROGRAM

AT  
MIDWAY ATOLL NATIONAL WILDLIFE REFUGE

---

MIDWAY ATOLL, NORTHWESTERN HAWAIIAN ISLANDS



UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

APRIL 1996

U.S. Department of the Interior  
FISH AND WILDLIFE SERVICE  
Region 1, Portland, Oregon

Selection of Alternative

and

**FINDING OF NO SIGNIFICANT IMPACT**

for the

**Refuge Logistics and Operations Support  
and Public Use Program at Midway Atoll National Wildlife Refuge  
Midway Islands, Northwestern Hawaiian Islands**

The U.S. Fish and Wildlife Service has prepared an environmental assessment to evaluate a proposed logistics and operations support and public-use program at the Midway Atoll National Wildlife Refuge (Refuge) that will be managed under a cooperative partnership between the U.S. Fish and Wildlife Service and a private contractor (Midway Phoenix Corporation). Copies of the draft environmental assessment were sent to more than 150 interested parties (see list in section 6 of the assessment). Because the final environmental assessment is not substantially different from the draft and the majority of public input was highly supportive of the proposed action, only an announcement of the decision is being made through local news media, and copies of this Finding of No Significant Impact are being distributed to those on the mailing list.

The environmental assessment evaluated two alternatives — no action, and the proposed action. The proposed action (Alternative 2) has been selected for implementation and will provide a high level of logistical and operational support for Refuge management programs. The proposed action also provides for the establishment of a compatible public use program.

Alternative 2 was selected based upon the following factors:

- Through implementation of the proposed action, the Service can continue to meet its responsibilities for national trust resources by providing an effective level of natural resources management that will benefit endangered and threatened species, migratory birds, and other native fish, wildlife, and plant resources on the Refuge.
- Alternative 2 provides a cost-effective means to maintain and operate the airfield. This will allow for the continuation of vital transportation services that benefit Refuge operations and public health and safety. In addition to supporting Refuge management programs, maintenance of the airfield will provide an emergency landing airfield for private and commercial airplanes, and will provide ongoing support for the U.S. Coast Guard's search and rescue, border patrol, and fishery law enforcement activities.
- Alternative 2 provides for greater protection and maintenance of nationally significant historic resources at Midway Atoll.
- Alternative 2 provides opportunities for the public to see, to learn about, and to enjoy the unique natural and historic resources on Midway Atoll.

- Alternative 2 establishes an innovative partnership with a private sector company that will allow private enterprise to flourish while the Service continues to carry out the mission of the National Wildlife Refuge System. The partnership will reduce the cost to the Service of logistics support (such as transportation) and will allow the Service to devote more of its limited funding directly to natural resources management activities.

Alternative 1, the no-action alternative, provides for a low level of Refuge logistical and operational support and does not provide for public use. If selected, Alternative 1 would result in a low level of Refuge management. Alternative 1 was not selected because it does not meet several refuge management goals. This alternative would lead to a decrease in the opportunity to protect and recover listed species, it would lead to a decline of native natural biodiversity, it would result in the loss of a number of historical properties, it offers no opportunities for public visitation or education, and it does not serve other public interests such as safety and law enforcement.

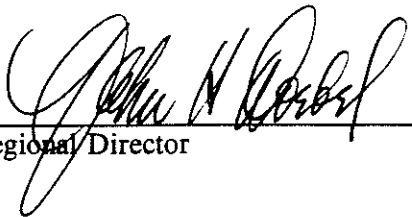
The following summary of effects (see also section 4 of the environmental assessment) is the basis for the finding of no significant impact:

- Compared with recent historical levels of human activity at the former Midway Naval Air Facility, the proposed action represents a reduction in the level of human activity and supplants military land uses with Refuge management and controlled public use.
- Because Midway Atoll is located far from any municipality, effects on society are minimal. There are no significant economic effects of the proposed action and no residents would be displaced.
- Midway Atoll has significant natural and historical resource values including endangered and threatened species, critical habitat, migratory birds, and nationally significant historic properties. The proposed action has been evaluated with respect to the continued conservation, protection, and management of these resources. Measures to avoid or reduce potential adverse effects have been incorporated into the proposal and include provisions for carefully controlled public use (including restrictions on activities, limits to use levels, and restrictions on areas). The proposed action calls for a high degree of education and training for residents and visitors. Monitoring programs will be implemented to detect adverse effects and to help ensure programs are compatible with Refuge purposes. The Service bears the responsibility of ensuring compatibility with Refuge purposes and retains the ability to modify use levels, practices, or institute new limitations to protect wildlife and historic resources.
- There would be no significant effects of the action on human health and safety, although the proposed action would benefit public health and safety.
- The environmental assessment considered long-term and cumulative effects. Although some details for some of the proposed construction projects were not available, these were analyzed programmatically over the long term. No significant adverse long-term or cumulative effects were found to result from implementing the proposed action.

Based upon my review and evaluation of the information contained in the environmental assessment, I have determined that the logistics and operations support program and the establishment of a public-use program at Midway Atoll National Wildlife Refuge on the Midway Islands, northwestern Hawaiian Islands, is not a major Federal action that 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. Accordingly, the preparation of an environmental impact statement on the proposed action is not required.

This Finding of No Significant Impact (FONSI) and the supporting environmental assessment and public-use plan will be available for public review for 30 days from the signature date. During this 30-day period, the FONSI will not be final, nor will the Service implement the selected alternative. The final decision will be made on whether to carry out the proposed action at the conclusion of the 30-day period.

The final environmental assessment is on file at: U.S. Fish and Wildlife Service, Pacific Islands Ecoregion Office, 300 Ala Moana Boulevard, Room 3108, Box 50088, Honolulu, Hawaii 96850 (telephone: 808-541-2749). Copies of the final environmental assessment are available upon request.

*ACTING*   
Regional Director

*4/22/96*  
Date

**Supporting Reference**

U.S. Fish and Wildlife Service, 1996. *Final Environmental Assessment for the Proposed Refuge Logistics and Operations Support and Public Use Program at Midway Atoll National Wildlife Refuge.*

## Cover Sheet

**Proposed action:** Refuge Logistics and Operations Support and Public Use Program at Midway Atoll National Wildlife Refuge, Northwestern Hawaiian Islands

**Stage of process:** Final Environmental Assessment

**Lead agency:** U.S. Department of the Interior, Fish and Wildlife Service

**Responsible official:** Regional Director  
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**Date:** April 19, 1996

**Abstract** Midway Islands (also referred to as "Midway Atoll") is an atoll ecosystem of exceptional wildlife value. The atoll supports the largest Laysan albatross colony in the world, the second largest black-footed albatross colony in the world, at least 14 other species of migratory seabirds, and 4 species of migratory shorebirds. Other wildlife at Midway Atoll include endangered Hawaiian monk seals, threatened green sea turtles, and a diversity of other marine species. Midway Atoll was the site of a pivotal battle during World War II and contains a number of nationally significant historical resources. These spectacular national trust resources are managed by the U.S. Fish and Wildlife Service (Service) through programs of the Midway Atoll National Wildlife Refuge (Refuge).

The U.S. Navy has closed Midway Naval Air Facility and will leave the atoll in 1997. The Service will assume control of the atoll as the Navy phases out its activities. To meet Refuge management objectives, the Service is proposing to enter into a long-term agreement with a private company for Refuge logistics and operations support. The private company would provide air services and other logistical support for refuge operations, oversee facilities operations and maintenance, and operate some aspects of a Refuge public use program in cooperation with the Service. By entering into the proposed agreement, effective Refuge management programs could continue and the Service would be able to continue supporting the programs of cooperating agencies such as the National Marine Fisheries Service and the U.S. Coast Guard. The proposed public use program would provide visitors with first-hand experiences of wildlife common to the Northwestern Hawaiian Islands and opportunities to see and learn about the historic resources at Midway Atoll. Proceeds from the Refuge public use program would enable the company to recover costs associated with Refuge logistics and operations support. The agreement would contain provisions to ensure that all secondary uses on the Refuge would be compatible with Refuge purposes, would comply with applicable Federal regulations, and would avoid or minimize potential adverse effects to the outstanding natural and historical resources on the Refuge.

The Service has incorporated public comments from the March 1996 draft environmental assessment into this final environmental assessment. Based on the analysis presented in the environmental assessment, the Service has issued a Finding of No Significant Impact.

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**Final Environmental Assessment  
for the Proposed  
Refuge Logistics and Operations Support  
and Public Use Program at  
Midway Atoll National Wildlife Refuge**

## **1 Section 1. Purpose of and Need for Action**

### **1.1 Need for the proposed action**

Midway Islands comprise an atoll ecosystem of exceptional wildlife value. More than a million seabirds nest on the islands of Midway Atoll including the world's largest Laysan albatross colony. The atoll supports at least 15 other species of migratory seabirds; 4 species of migratory shorebirds; and a diversity of other native wildlife including endangered Hawaiian monk seals, threatened green sea turtles, marine mammals, and other marine organisms. The U.S. Fish and Wildlife Service (Service) protects and manages natural resources through programs of the Midway Atoll National Wildlife Refuge (Refuge).

The Service is also responsible for significant historical resources at Midway Atoll. Midway Atoll was defended from attack on December 7, 1941 and was the base for the June 1942 "Battle of Midway," widely recognized as the turning point for World War II in the Pacific. In addition to resources associated with the War in the Pacific, other historic properties include cable station buildings associated with trans-Pacific communication history; a seaplane hangar; and buildings associated with defense related patterns of Navy base development.

Midway Atoll is being transferred to the Service through the provisions of the Defense Base Closure and Realignment Act of 1990. The Navy anticipates leaving the atoll in June 1997, after the majority of environmental cleanup efforts are completed. After Navy support

operations cease, the Service needs to provide sufficient logistical and operational support to meet Refuge management objectives. The Refuge's remote location makes operational and logistic support both costly and complex. Air services are required to transport personnel and cooperators to and from the Refuge and to provide the Refuge with necessary support provisions and other supplies and equipment. The continuation of the airport facility would enable the public to visit the Refuge. The airport would support other important public services; it would allow for emergency landings, support U.S. Coast Guard search and rescue and law enforcement operations, and would accommodate some refueling of transient aircraft.

### **1.2 Purpose of the proposed action**

The purpose of the proposed action is to provide the logistical and operational support needed to meet Refuge objectives. The Service is also proposing to a public use program that would directly and indirectly support Refuge operations and provide opportunities for education and interpretation of wildlife and historic resources, and provide opportunities for compatible wildlife-dependent outdoor recreation.

### **1.3 Description of the proposed action**

The Service is proposing to enter into a long-term partnership with a private company for Refuge logistics and operations support. The Service is also proposing to allow compatible public use at Midway Atoll National Wildlife Refuge under an approved public use plan. All secondary uses on the Refuge must be compatible with Refuge purposes.

## Section 1. Purpose of and Need for the Action

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### 1.4 The project area

Midway Atoll (formally designated as Midway Islands) is located in the northwestern portion of the Hawaiian islands archipelago approximately 1,250 miles northwest of Honolulu (figure 1-1). The atoll features a roughly circular outer reef approximately 5 miles in diameter and encloses a central lagoon. Two main islands are located in the southern portion of the atoll and total approximately 1,600 acres of emergent land.

### 1.5 Related agency actions

#### 1.5.1 Current Refuge management

The Service has managed Midway Atoll as an overlay national wildlife refuge since 1988 through a cooperative agreement with the U.S. Navy. Refuge management is guided by an approved Natural Resources Management Plan (U.S. Fish and Wildlife Service 1991) and accomplishments are reported in annual narrative reports.

The mission, purpose, and priority public uses of the National Wildlife Refuge System were clearly defined in an Executive Order issued on March 25, 1996.

*"The mission of the National Wildlife Refuge System is to preserve a national network of lands and waters for the conservation and management of fish, wildlife, and plant resource of the United States for the benefit of present and future generations."*

Four overall guiding principles for the management and general public use of the National Wildlife Refuge System are:

(a) Public use [including] "... compatible wildlife-dependent recreational activities involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation.";

(b) Habitat. "The Refuge System will continue to conserve and enhance the quality and diversity of fish and wildlife habitat within refuges.";

(c) Partnerships. "Conservation partnerships with other Federal agencies, ..., organizations, industry, and the general public can make significant contributions to the growth and management of the Refuge System."; and

(d) Public Involvement. "The public should be given a full and open opportunity to participate in decisions regarding acquisition and management of our National Wildlife Refuges."

Refuge management goals for Midway Atoll National Wildlife Refuge currently include:

- Endangered and threatened species protection and recovery
- Management of migratory birds
- Preservation of native biodiversity
- Biological monitoring
- Habitat enhancement
- Alien species control
- Research
- Public education
- Protection of historic sites

Specific Refuge management programs include protection and recovery programs for endangered monk seals and threatened green sea turtles; research; monitoring of seabirds; habitat enhancement (including nonnative plant and animal control, wildlife hazard remediation, outplanting with native plants, erosion control, and control of human disturbance); and coordination with the Navy to minimize adverse effects of base closure operations. Service employees work with the Navy to provide opportunities for Navy and its contractors to learn about natural resources at Midway Atoll. Refuge employees provide orientation briefings, and educational/interpretive brochures and displays, and provide opportunities for the Navy and others to volunteer with Refuge management programs.

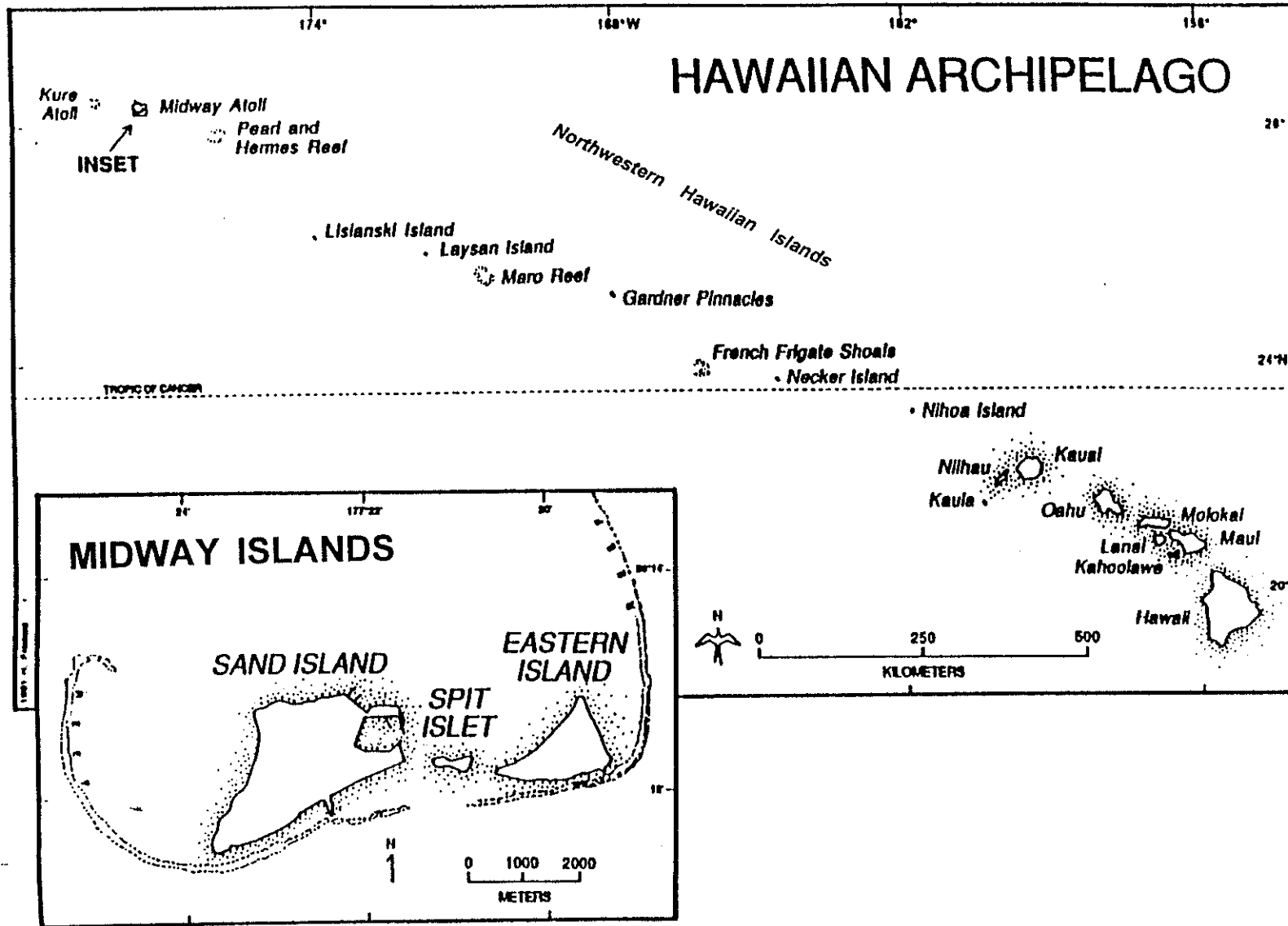


Figure 1-1. Location map of Midway Islands. *The two main islands, Sand Island and Eastern Island total approximately 1,600 acres. Other features of the atoll include a fringing reef that encloses the islands, a central lagoon, and an ephemeral islet, Spit Islet. The proposed Refuge logistics and operations support program would be centered at Sand Island.*

## Section 1. Purpose of and Need for the Action

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### **1.5.2 Protection of historic properties**

Midway possesses a number of important historical resources. In order to meet the requirements of the National Historic Preservation Act of 1966, the Navy and the Service consulted with the Advisory Council for Historic Preservation (ACHP). This consultation resulted in a programmatic agreement among the parties to ensure the appropriate treatment of Midway's historic properties. The Service will prepare an historic preservation plan for the management of historic properties at Midway Atoll. The Service plans to use some sites as facilities for its operations, interpret many of the sites as part of the proposed public use program, and restore a limited number of sites. A list of historic resources that the Service has responsibility for is found in the programmatic agreement.

### **1.5.3 Coordination with the Navy during base closure and environmental cleanup**

The Navy has provided funding for three Service employees who assist them with minimizing or avoiding adverse impacts to wildlife during base closure activities. The Service and the Navy will operate under the terms of a plan that guides the smooth transition of Midway Atoll as the Navy prepares to depart Midway Atoll. During the Service phase-in period, the Navy will continue to complete environmental cleanup, historic properties preservation, and reduction of facilities to a level requested by the Service. The Navy will continue all existing recreational activities until its departure from the atoll. These activities include the use of all beaches on Sand Island except the closed portion along the southern shore, fishing, spearfishing, diving, and snorkeling. Navy personnel and contractors would be allowed to continue to take lobsters (for personal consumption only).

### **1.5.4 Activities at Midway Atoll by other agencies**

**National Marine Fisheries Service (NMFS)** enforces the provisions of the Marine Mammal Protection Act and the Endangered Species Act. NMFS has trust responsibility for the protection and recovery of monk seals and for sea turtles (at sea). The Service cooperates with NMFS to implement research and other recovery programs at Midway. Under section 7 of the Endangered Species Act, the Service must consult with NMFS for any action that may affect monk seals or sea turtles. The results of the consultation for this proposal are discussed in section 4.3.3. below.

**U.S. Coast Guard** stages missions including fishery and wildlife law enforcement, immigration patrols and law enforcement, emergency medical evacuations of merchant mariners, and search and rescue from Midway Atoll and provides support for Refuge programs including transportation. The Coast Guard maintains a residence for intermittent personnel at Sand Island.

**National Weather Service** operates and maintains a tide gauge and weather station at Sand Island, Midway.

**Research.** The Service works with the University of Hawaii, the National Biological Service, and other agencies to undertake research at Midway Atoll. Research proposals are evaluated by the Service for compatibility on a case-by-case basis and are conducted under special use permits.

**Advisory Council on Historic Preservation (ACHP)** provides technical assistance to the Service to ensure compliance with historic preservation laws. The Service consults with the ACHP for all activities that may affect historic resources at Midway Atoll including the restoration, maintenance, reuse, and interpretation of historical resources.

## Section 1. Purpose of and Need for the Action

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**Nature and historic education.** The Service supports education and public information by allowing journalists and photographers to visit Midway Atoll on a case-by-case basis under special use permits.

### **1.6 Decisions to be made based on the analysis**

The Regional Director of the U.S. Fish and Wildlife Service, Pacific Region, will select a proposed alternative and determine whether or not the proposed action would constitute a major Federal action significantly affecting the quality of the human environment.

### **1.7 Public involvement, scoping, and identification of the issues**

The Service worked closely with the U.S. Navy, the Midway Reuse Committee, and other agencies with trust responsibilities at Midway to identify interested and affected parties and issues. The Service mailed over 100 copies of a prospectus that briefly outlined the proposed action to parties with a known interest in wildlife or historic resources at Midway Atoll. The public mailout included a postcard which allowed us to identify persons interested in reviewing and commenting upon the draft environmental assessment. A notice of the availability of the draft environmental assessment was published in the Hawaii Office of Environmental Quality Control Bulletin on March 8, 1996. A news release was also issued on March 8, 1996 which announced the availability of the draft environmental assessment.

The Service distributed over 150 draft environmental assessments and received additional coverage through an article in the local newspaper. Eighty-five letters were received during the public comment period. Of these, the majority were from former residents (including former servicemen and

servicewomen, civilian contractors and dependents) who are familiar with Midway Islands and continue to be concerned about the atoll. Other interested parties included biology teachers, former Pan American Airlines pilots and stewards, outdoor writers, interested citizens, wildlife researchers, and people representing conservation organizations. Of the responses, the vast majority were highly supportive of proposal. Only one respondent was against the proposed action and supported the no-action alternative because they considered ecotourism incompatible with wildlife conservation. All of the respondents recognized the unique nature of the natural and historic resources on Midway Atoll and the need to protect sensitive species from human disturbance. The project proponents agreed that controlled public ecotourism would be feasible at the Refuge. The Service evaluated the comments and incorporated concerns into the environmental assessment, the proposed cooperative agreement, and the proposed public use plan.

Because the comments received were generally supportive, and because there were no major substantive changes to the final environmental assessment, the Service does not intend to distribute the final environmental assessment to most of the respondents. Instead, they will be informed of the Service's findings and decision.

The Service utilized the interdisciplinary expertise of its staff from the Pacific Islands Ecoregion and the regional office, other government agencies, and the public in developing the proposed action and evaluating the environmental effects of the proposed action. The primary issues that are tracked through the document are: 1) the degree to which the alternatives meet Refuge goals, and 2) effects of the proposed action on the environment.

## **1.8 Authorities**

The National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. Section 668dd-668jj) provides guidelines and directs administration and management of national wildlife refuges. The act requires all secondary uses to undergo a compatibility determination before they are authorized.

The Refuge Recreation Act (16 U.S.C. 460k-460k-4) permits compatible recreation as a secondary use on national wildlife refuges. In addition to requiring that uses must not interfere with the refuge's primary purposes, the act requires that funds must be available to administer recreational uses before allowing the uses. The act authorizes public use fees and permits and establishes penalties for violation of regulations. It also authorizes the acceptance of donations of funds and property in carrying out the purposes of the act.

## **1.9 Compliance**

The Service is obligated to comply with a number of Federal laws, Executive Orders, and departmental policies including, but not limited to: the National Environmental Policy Act (NEPA) of 1969, as amended; Executive Order (E.O.) 12372: Intergovernmental Review of Federal Programs; the Endangered Species Act of 1973, as amended; the Migratory Bird Treaty Act of 1918, as amended; E.O. 11593: Protection of Historical, Archaeological, and Scientific Properties; the National Historic Preservation Act of 1966, as amended; the Archaeological Resources Protection Act; the Federal Water Pollution Control Act ("Clean Water Act") of 1948, as amended; the Marine Mammal Protection Act of 1972, as amended; E.O. for the Management and General Public Use of the National Wildlife Refuge System, and other authorities. The Service would be responsible for compliance and for obtaining all permits required for the operations and maintenance of facilities at Midway Atoll.

## **1.10 Document organization**

Section 1. discusses the need for and purpose of the proposed action, issues, authorities, and document scope. Section 2 describes the alternatives. Section 3 describes the affected environment. Section 4 describes the potential environmental consequences of the alternatives. Section 5 lists the preparers and reviewers. Section 6 lists agencies, organizations and persons provided with copies of the environmental assessment. Section 7 provides a list of references cited and is followed by the appendices. Appendix A is a glossary. Appendix B is a summary of the proposed Refuge logistics and operations support program. Appendix C is the public use plan.

## **1.11 Scope of the environmental assessment**

This environmental assessment (EA) evaluates the potential environmental effects of implementing a cooperative agreement for Refuge logistics and operations support and public use at the Midway Atoll National Wildlife Refuge. It evaluates the programs in their entirety and considers the short-term, long-term, and cumulative effects. It provides a systematic analysis of programmatic activities and will be used to determine whether such activities would have a significant effect on the quality of the physical, biological, and human environment; whether a formal environmental impact statement is required; and to aid Service's compliance with the National Environmental Policy Act.

## **2 Section 2. Alternatives Including the Proposed Action**

### **2.1 Early planning and development of the alternatives**

The Service developed a list of facilities and services required to support Refuge operations at an effective level following the Navy's departure. A "Request for Proposals" was published in the *Commerce Business Daily* in January 1995. On the basis of its competitive response, Midway Phoenix Corporation (MPC) was selected to become the cooperator for providing operational, logistical, and public use support for the Refuge.

The proposed logistics and operations support and public use program at Midway Atoll was developed by the Service in close coordination with MPC to ensure compatibility with the purposes of the Refuge. On September 19, 1995, the Service provided MPC with a letter of intent to enter into a formal agreement for the Refuge operations support and public visitation program, pending transfer of Midway to the Service and environmental review of the project. The proposed Refuge operations and logistics support program is summarized in section 2.4.2 and more fully described in appendix B.

### **2.2 Alternatives rejected from detailed consideration**

The following alternatives were initially considered, but later rejected from detailed consideration.

The Service considered forming a partnership with the Coast Guard to maintain airport facilities at Midway Atoll. This alternative was dropped after the Coast Guard was not able to commit funds to the proposed project.

The Service considered leaving Midway Atoll entirely. This alternative did not meet Service mandates for management of significant national

trust resources at Midway Atoll and this alternative was dropped from further consideration.

The Service considered entering into an agreement only for the maintenance and operation of the airfield and fueling facilities. Potential airport users might include the Coast Guard, transient aircraft, visitors to the Refuge on a case-by-case basis, and Service-contracted airplanes. There would be no public use program and all secondary uses would be by special use permit only. Due to limited air traffic in the mid-Pacific area, this alternative was considered financially unfeasible and dropped from further consideration.

The Service considered entering into a short-term cooperative agreement with MPC for Refuge logistics and operations support at Midway Atoll. However, financial analysis conducted by MPC showed the need for approximately 20 years to recoup its initial investment in upgrading, operating, and maintaining the facilities at Midway Atoll.

The Service considered operating the Refuge as a two-person, remote-island field camp, but this level of management did not meet Refuge management objectives, so the alternative was dropped from further consideration.

Two letters requested the Service consider establishing a prison on Midway Atoll and use prisoners for labor. It was suggested that prisoners would be rehabilitated through the increased self-esteem gained from working with wildlife and on habitat restoration. The Service considered this suggestion, but believes that a remote prison at Midway would be expensive to build and operate, and would be too far from other support programs. Furthermore, a prison on the Refuge would likely be incompatible with the proposed public use program. Therefore, this alternative was dropped from further consideration.

### **2.3 Features common to each alternative**

The proposed action and the no action alternative would continue to implement some level of natural resources management through programs of the Midway Atoll National Wildlife Refuge under an approved refuge management plan. There would be refuge employees on Midway Atoll under either alternative.

### **2.4 Description of the alternatives**

#### **2.4.1 Alternative 1, no action. Operate the Refuge with low-level logistical and operational support with no public use program**

Alternative 1, the no action alternative, evaluates the environmental effects of maintaining the *status quo*. Under alternative 1 the Service would not enter into an agreement for Refuge logistics and operations support and would not implement a public use program. Refuge management would continue to be conducted under an approved refuge management plan.

Under alternative 1 the Service would retain only those buildings and facilities on Sand Island that it needed for Refuge administration and operations. Other buildings would likely be demolished because the Service would not have the ability to maintain them and they would eventually become wildlife and human hazards. Demolition of buildings would be done in coordination with the Navy and the Advisory Council for Historic Preservation and would comply with applicable regulations.

Under alternative 1 the airfield would be minimally maintained to allow for landing of Service contract aircraft, Coast Guard aircraft, and emergency landings. Fuel would not be stored on island. Under alternative 1, air logistics support would be minimal because of

the high costs of aircraft charters. After the departure of the Navy, access to the Refuge would generally be on a space-available basis on contracted seagoing vessels (e.g., National Oceanic and Atmospheric Administration research vessels and Coast Guard vessels) which travel through the Northwestern Hawaiian Islands approximately twice a year.

The increased costs of logistics would likely result in a low level of Refuge staffing and funding for management activities. There would be very limited opportunities for cooperators to assist with management or research. Increased costs and logistical complexities would decrease the amount of funding available for direct resource management. Increased costs and reduced opportunities for partnerships would likely result in a low level of intensity and effectiveness of some refuge management programs.

Under the no-action alternative, there would be extremely limited public education opportunities.

#### **2.4.2 Alternative 2. Operate the Refuge with high-level logistical and operational support and implement a compatible public use program (the proposed alternative)**

Under alternative 2, the Service would enter into a long-term cooperative agreement with Midway Phoenix Corporation (MPC) for Refuge logistics and operations support. The proposed logistics and operations program is summarized here and more fully described in appendix B. The agreement between the Service and MPC would contain specific responsibilities and requirements to ensure that the program meets all applicable Federal regulations and refuge requirements.

Under alternative 2, the Service would operate the Refuge with a high level of logistical and operations support and implement a compatible public use program. Income derived from



## Section 2. Alternatives Including the Proposed Action

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participants would pay for logistics and operations support. Refuge funding would be available primarily for natural resources management, although there would be some additional staffing required. An effective level of natural resources management could occur under alternative 2. Under this alternative, there would be opportunities for Service cooperators and the public to visit Midway Atoll.

### **General description of the proposed Refuge logistics and operations support program**

Under alternative 2, support provided by MPC would include the following:

- Aircraft and vessel transportation for supplies, staff, cooperators, the public, and translocation of monk seals.
- Operate and maintain the airfield, fueling facility, and harbor facility.
- Maintain buildings for refuge and cooperator staff housing, offices; laboratory; supplies; equipment; and recreation, shop, and dining facilities.
- Maintain historic properties according to programmatic agreement.
- Operate and maintain electrical system, phone system, refuse disposal system, sewage system, and roads.
- Maintain equipment necessary for operation of the island.
- Maintain grounds according to Refuge management plans and assist with habitat restoration.
- Provide alien species introduction prevention and control.

Under alternative 2, existing facilities on Sand Island would be refurbished, restored, and utilized to the extent possible. A limited number of new facilities would be required to support the proposed programs.

*Provisions to address environmental concerns.* Facilities would be operated and maintained to meet applicable Federal regulations and Refuge administration requirements. The Service and

MPC would work closely to ensure operations are conducted in an environmentally sensitive manner. All operations would follow refuge directives and refuge operating plans (such as the grounds maintenance plan, waste management plan, Federal Facilities Response plan, integrated pest management, and others). The partnership would allow for integrating new guidelines into operations as necessary. The activities of off-duty employees at Midway Atoll are considered in the public use plan.

### **General description of the proposed Refuge public use program**

The public use program would be overseen by the Service with MPC operating certain aspects. The public use plan was developed by public use specialists in close coordination with Refuge managers, biologists, and MPC and is attached as appendix C. The objective of public use at Midway is to provide high quality, compatible wildlife or historic related education and recreational experiences. The public visitation program would include the following activities:

- Self-guided natural and historical resources walks, bicycle tours, and wildlife photography
- Guided nature tours, history tours, and wildlife photography
- Guided snorkeling and diving
- Museums, interpretive kiosks, and visitor contact stations
- Special interpretive/educational programs
- Participatory research and management
- Sportfishing

During the first year, while the Navy remains at Midway Atoll, the public use program would be in a developmental phase. During this phase, up to 30 visitors would be accommodated. The Refuge public use specialist would make refinements to the public use program based on feedback from visitors and staff, and data on wildlife impacts gathered from the field.

*Provisions to address environmental concerns.*

The development phase provides for a low-level of public use as the final plan is developed. The development phase calls for monitoring to be conducted and refinements to be made to the public use plan to ensure the program is environmentally sensitive and minimizes human disturbance to wildlife. The Service will ensure that adequate staffing and funding are available to implement the program.

The public use plan minimizes potential adverse environmental effects of public use on wildlife by: 1) providing for adequate staffing; 2) defining permitted activities and including guidelines for those activities; 3) designating closed and open areas; 4) providing for a high level of public information to be distributed in the form of pre-visit information packets, visitor and employee orientations, lectures, brochures, guided tours, and static displays; 5) providing high-quality guided activities; 6) restricting access to the most sensitive areas of the Refuge; and 7) closely coordinating with the National Marine Fisheries Service and other natural resources management agencies in the development of the program.

## **2.5 Comparative evaluation of the alternatives**

Table 2-1 provides a summary comparison of the alternatives.

Section 2. Alternatives Including the Proposed Action

Table 2-1. Comparison of the Alternatives.

Refuge management objective:	ALTERNATIVE	
	Alternative 1. No action. Low level of logistical and operational support and no public use program	Alternative 2. High level of logistical and operational support and compatible public use program
<ul style="list-style-type: none"> <li>● Protection and management of endangered and threatened species</li> </ul>	Extremely limited ability to implement recovery actions for listed species due to limited logistics support, high costs, and low number of personnel; human disturbance limited to Service staff and close cooperators	Effective recovery programs could be implemented because the Service would be able to allocate sufficient resources to recovery programs and there would be support for close cooperators; air support would aid monk seal translocations; human activities would be carefully directed on the Refuge to minimize disturbance to listed species; the public would be able to participate in recovery activities
<ul style="list-style-type: none"> <li>● Management of migratory birds</li> </ul>	Low level of management could adversely affect migratory birds by ineffective habitat enhancement programs	Migratory birds would benefit from fully effective Refuge management programs including habitat enhancement; human activities would be carefully directed in order to prevent adverse impacts
<ul style="list-style-type: none"> <li>● Conservation of native biodiversity</li> </ul>	Low level of management could result in a decrease in abundance of native species	Native biodiversity would receive long-term protection through Refuge management
<ul style="list-style-type: none"> <li>● Biological monitoring and other research</li> </ul>	Extremely limited opportunities for monitoring and research due to high costs and limited logistical support	Opportunities would exist for long-term biological monitoring and other research
<ul style="list-style-type: none"> <li>● Habitat management</li> </ul>	Extremely limited ability to enhance or restore native habitat	Effective restoration programs would occur
<ul style="list-style-type: none"> <li>● Nonnative species control</li> </ul>	Extremely limited ability to effectively control harmful nonnative species such as rats and invasive plants	Effective control of noxious nonnative plants and animals

Section 2. Alternatives Including the Proposed Action

Refuge management objective:	ALTERNATIVE	
	Alternative 1. No action. Low level of logistical and operational support and no public use program	Alternative 2. High level of logistical and operational support and compatible public use program
<ul style="list-style-type: none"> <li>● Protection and management of endangered and threatened species</li> </ul>	Extremely limited ability to implement recovery actions for listed species due to limited logistics support, high costs, and low number of personnel; human disturbance limited to Service staff and close cooperators	Effective recovery programs could be implemented because the Service would be able to allocate sufficient resources to recovery programs and there would be support for close cooperators; air support would aid monk seal translocations; human activities would be carefully directed on the Refuge to minimize disturbance to listed species; the public would be able to participate in recovery activities
<ul style="list-style-type: none"> <li>● Public education and natural and historical resources interpretation</li> </ul>	No public access for education and interpretation	Access would be available; Refuge public use program would provide opportunities for high quality compatible public use for education and interpretation.
<ul style="list-style-type: none"> <li>● Preservation of historic sites</li> </ul>	Limited to historic resources maintained for Refuge use	Several historic properties would be maintained and reused for Refuge programs
<ul style="list-style-type: none"> <li>● Wildlife-oriented public recreation</li> </ul>	None	Public use program would provide opportunities for compatible public recreation
Costs:benefits relationship to resource management	High costs for logistics support and operations and maintenance would likely reduce money available for actual natural resources management	Proposed cooperative agreement would be at no cost to the Service; Refuge operating funds would go directly to natural and historic resources management; Service would require additional staff to assist with contract oversight and to manage the public use program; cooperator would also contribute to management programs

### 3 Section 3. Affected Environment

This section discusses the relevant components of the existing environment. The existing status will serve as a baseline against which to measure the effects of both alternatives. This section provides very basic coverage of the affected environment in order that the public may be informed. However, the reader is referred to the *Natural Resources Management Plan for Naval Air Facility, Midway Island* (USFWS 1991) for greater detail.

#### 3.1 General

The affected area includes public lands and waters of Midway Atoll. The atoll is located in the northwestern Hawaiian islands between the parallels of 28°5' and 28°25' North latitude and between the meridians of 177°10' and 177°30' West longitude. Midway Atoll is approximately 5 miles in diameter and features two main islands, an encircling reef, and a lagoon. Emergent land totals approximately 1,600 acres. Sand Island (the current operational center) is approximately 1.8 miles long by 1.2 miles wide comprising approximately 1,200 acres. Eastern Island is located one mile east of Sand Island and is approximately 334 acres. Spit Island is a small, ephemeral sandspit between Sand and Eastern Islands.

#### 3.2 Infrastructure

Figure 3-1 is a map of Sand Island showing the location of the airfields, hangar, operational areas, fuel tank farm, and the boat harbor. The cover photograph is of Sand Island taken during the Navy's tenure.

Sand Island and Eastern Island were formerly extensively developed by the military. During World War II, Midway Atoll supported approximately 10,000 military personnel. Spit Island has never been used by the Navy. Eastern Island has been unoccupied since 1970. It was designated by the Navy as a wildlife sanctuary and was off-limits to visitors without

permission. Navy cleanup operations removed substantial quantities of debris from demolished buildings and infrastructure. The runways of Eastern Island are being overgrown with vegetation and only one building remains. Eastern Island has a number of historic sites and artifacts.

Sand Island is the current operational center for the Navy and the Service. Navy infrastructure on Sand Island that remains in place and operational includes the airport (with airfields and hangar), a boat harbor, a fuel tank farm, paved roads and dirt trails, a power plant and utility poles and lines, a bulky waste landfill, a sewage and drainage system, and a rainwater collection and distribution system. Communications include three telephone lines and a satellite dish for television reception. Other buildings include offices, housing (former barracks and officers' residences), a medical clinic, a dining hall, cold storage and other support facilities (warehouses, shops, and recreation facilities), and a beach recreation picnic pavilion. The Navy is demolishing all buildings not requested by the Service for reuse. The result of this demolition program will be an island with significantly reduced facilities and operations compared to Navy operations prior to base closure. A number of buildings the Service retained are of historical significance.

The airport currently supports arrivals and departures of a variety of aircraft including Coast Guard C-130 transport aircraft, Air Force C-141 starlifters, and smaller private jets and airplanes. On island, most residents rely on bicycles for transportation. A limited number of vehicles are operated on Sand Island including golf carts, automobiles, trucks, vans, and small buses. Heavy equipment on island includes large trucks, cranes, mowers, bulldozers, and other machinery used to support base closure operations. The Navy currently uses six small outboard motorboats, two tugboats, and a beach landing craft for water based transportation.

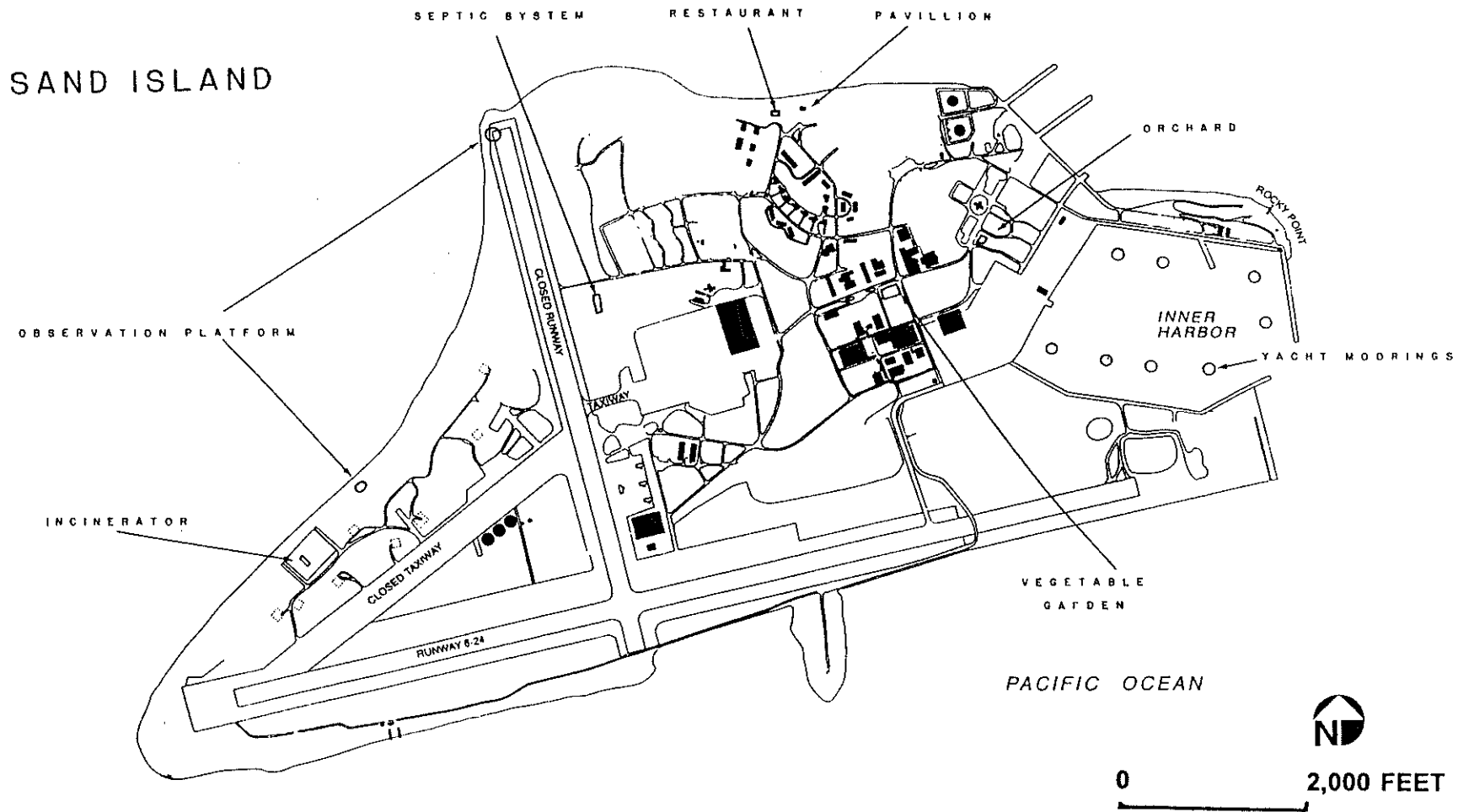


Figure 3-1. Map showing the existing and proposed infrastructure on Sand Island, Midway Atoll. *Minimal facilities at Eastern Island include a proposed comfort station.*

### **3.3 Physical environment**

#### **3.3.1 Topography, soils, and climate**

Sand Island and Eastern Island are low-lying coral islands with a maximum elevation of approximately 43 feet and 35 feet above sea level, respectively. The islands have been extensively modified and were built up by the military from coral rubble dredged from the lagoon. A thin layer of organic material is present in vegetated areas overlying a highly permeable sand and coral substrate. Much of the soil on Midway Atoll has been imported.

Midway Atoll has a semi-tropical oceanic climate generally influenced by moderate northeasterly to easterly trade winds. The summer months (April through November) are warm, humid, and sunny with occasional showers. Winter months (December through March) are characterized by lower temperatures, frequent rains, and high winds.

#### **3.3.2 Hydrology and water resources**

No surface water is found at Midway due to the porous nature of the substrate. Fresh water supplies are limited to rainwater collected in a 220-acre catchment basin. Course-filtered rain water is chemically treated, settled, prechlorinated, then sand filtered prior to distribution. A small brackish groundwater lens exists below the surface. Eleven shallow ground-water wells to the lens will be capped by the Navy.

#### **3.3.3 Air quality/noise**

Current facilities that may emit air pollutants include the carpenter shop; spray paint shop; power plant; boilers; open burning of solid waste at landfills; and open burning of waste oil. Other emissions are from automobiles, small motorized equipment, airplanes, and power

boats. Airplanes cause intermittent noise at Midway Atoll during takeoffs and landing.

### **3.4 Social and economic environment**

#### **3.4.1 Population**

The current population of Midway Atoll is approximately 400 persons. This includes approximately five Service employees and a number of volunteers. Other residents include approximately 5 Navy personnel and 350 Navy contractors involved in base closure and support. Transient visitors total approximately 40 at a time.

#### **3.4.2 Employment**

All of the residents on Midway are Federal employees, employees of Federal contractors, or sponsored visitors. There is no established local economy and no tax revenue.

#### **3.4.3 Land use**

All of Midway is used for the Midway Atoll National Wildlife Refuge. Land uses in addition to refuge management currently include Naval base closure operations and operational support areas (such as roads, operational areas, town center).

Critical habitat has been designated at Midway Atoll for the endangered Hawaiian monk seal (U.S. Dept. of Commerce 1995). Critical habitat at Midway Atoll includes "all beach areas, sand spits and islets, including all beach crest vegetation to its deepest extent inland, lagoon waters, inner reef waters, and ocean waters out to a depth of 20 fathoms (except for Sand Island and its harbor)."

All beaches of Eastern Island and Spit Islet are off-limits to personnel without permission, and the southern beach at Sand Island is currently off-limits to all personnel without permission.

Midway Atoll is surrounded by the 200-nautical mile U.S. Fishery Conservation Zone (FCZ) that was delineated by the 1976 Fisheries Conservation Management Act (FCMA). Within this boundary, which encompasses all of the Hawaiian Islands, the fishery resources are managed through regulations including restrictions on access and catch limits and administered by the Western Pacific Regional Fisheries Management Council (State of Hawaii 1979). In 1991, the Western Pacific Regional Fishery Management Council established a 50-mile radius "Protected Species Zone" closed to longline fishing to protect monk seals, sea turtles, and seabirds (Western Pacific Regional Fishery Management Council et al., undated).

#### **3.4.4 Public use**

There is currently very limited general public use of Midway Atoll. The Service and the Navy cooperatively manage a low level of outdoor use by Navy and contractor personnel including SCUBA diving, sportfishing, spearfishing, swimming, hiking, and beach recreation. Currently all beaches on Sand Island are open to island residents except for the southernmost beach which is off-limits to protect monk seal haulout areas. Navy boats provide residents with opportunities for fishing and diving. The Service participates in on-island orientations, lectures, wildlife information displays, and public information and outreach. The Service coordinates with Navy and contractor personnel for volunteer programs on the Refuge such as seabird research and marine debris cleanups. In the interest of outreach and public education, the Service and the Navy allow a limited number of people access to the Refuge for guided wildlife photography, journalism, education, and private research through special use permits issued on a case-by-case and space-available basis.

#### **3.4.5 Archaeological and historical resources**

The Navy conducted intensive archaeological and historical surveys of Midway Atoll and identified all buildings, structures and other

resources either included or eligible for inclusion in the National Register of Historic Places (Yoklavich and Reinman 1993, Yoklavich et al., 1994). Approximately 75 sites are considered eligible for listing on the National Register of Historic Places. The Service entered into a Programmatic Agreement with the National Historic Advisory Council and the Navy for the protection of significant historical resources (Advisory Council on Historic Preservation et al., 1996)

### **3.5 Biological environment**

Midway Atoll supports an abundant and diverse wildlife fauna that includes migratory seabirds, endangered Hawaiian monk seals, threatened green sea turtles, reef fishes, invertebrates, and other marine species. For a more complete description of the flora and fauna, refer to the Natural Resources Management Plan (USFWS 1991).

#### **3.5.1 Natural communities**

Native natural communities at Midway Atoll include native coastal strand (dominated by beach naupaka and morning glory) and marine communities. Naturalized nonnative plants include ironwood trees, tree heliotrope, sea grape, golden-crown beard, and poinsettia.

#### **3.5.2 Migratory birds**

Native seabirds are the most conspicuous wildlife. Sixteen species, numbering over one-million individuals, nest on the atoll each year. Midway supports the world's largest colony of Laysan albatross and the second largest colony of black-footed albatross. The atoll supports the largest colonies of red-tailed tropicbirds, black noddies, and white terns within the Hawaiian archipelago. Other native migratory birds include Pacific golden plovers, bristle-thighed curlews, ruddy turnstones, wandering tattlers, and sanderlings.



### 3.5.3 Endangered and threatened species

A small population of endangered Hawaiian monk seals occurs at Midway Atoll throughout the year. In recent years pups have been born in undisturbed areas. Eastern Island and Spit Island are the main pupping areas. Threats to monk seals include human disturbance, low population numbers, predation by sharks, competition for food, mobbing of females by aggressive males, and entanglement in marine debris (Gilmartin 1983, Gerrodette and Gilmartin 1990, Westlake and Gilmartin 1990).

Threatened green sea turtles are frequently seen inside the lagoon and its surrounding waters.

The short-tailed albatross is internationally listed as endangered throughout its range in the Pacific with the exception of the United States of America. The omission of the American population is an administrative error which is being corrected. Small numbers of short-tailed albatross have been arriving at Midway Atoll in recent years.

### 3.5.4 Other native species

Spinner dolphins occur in the lagoon. The lagoon supports over 130 species of fishes; and a variety of marine invertebrates. Fish inside of the lagoon have a high incidence of ciguatera toxin and are not suitable for human consumption. Sharks are abundant in the waters of the atoll.

### 3.5.5 Nonnative species

Harmful nonnative species at Midway Atoll include rats, mynah birds, and a number of invasive plants. Canaries have also become naturalized at Midway Atoll. Noxious nonnative plants that are a priority for control on Midway Atoll include sandbur, golden-crown beard, ironwood, and poinsettia. These nonnative plants outcompete and displace native plants. Ironwood shades out native species and can hasten erosion of sandy islands.

Rats prey on ground nesting seabirds, their eggs, and chicks, and are capable of destroying sea turtle nests (Kepler 1967).

### 3.5.6 Other threats

Human activities can adversely affect ground-nesting seabirds which are vulnerable to being accidentally stepped on or run over. Underground burrows are easily crushed. Human disturbance reduces the desirability of beaches as pupping areas for monk seals. Uncontrolled outdoor lighting can disorient nocturnal birds and may affect sea turtles.

At sea, commercial fishing activities and marine debris threaten wildlife resources. Birds, marine mammals and green turtles often become entangled in fishing lines, drift and trawl nets, ghost nets, and other marine debris (Henderson 1984, Reddy and Griffith 1988). Midway Atoll regularly accumulates a large amount of marine debris, and seabirds ingest floating plastics.

Wildlife entrapment hazards at Midway include aerial wires, fences, open pits, and other facilities. Navy base closure and cleanup which will remove a significant amount of these hazards.

### 3.5.7 Contaminants

The Navy is in the process of completing cleanup of contaminated sites. The Navy retains liability for contaminants related to their activities at Midway Atoll.

## **4 Section 4. Environmental Consequences**

This section evaluates the effects of the alternatives on the environment described in section 3. This section is organized by resources and topics are presented in the same order as section 3. The analysis of the environmental consequences uses the best available scientific information for the comparisons of the effects of the alternatives. Table 4-1 provides a summary of the effects of the alternatives on the physical, biological, social, and economic environment.

### **4.1 Effects on the physical environment**

#### **4.1.1 Soils**

Under alternative 1, there could be increased erosion if control of ironwood trees was ineffective.

Under alternative 2, effective restoration of native coastal strand vegetation, carried out through an effective management program, would enhance soil stabilization.

#### **4.1.2 Water resources**

Under alternative 1, marine water quality would benefit from ceasing the sewage outfall operations and from low ship traffic.

Under alternative 2, the sewage outfall system would be replaced by a septic system. There would be some vessel traffic in the waters of Midway Atoll related to Refuge operations and the public use program. In recognition of the potential adverse environmental effects of an oil spill on the environment of the atoll, the Service would have an Environmental Protection Agency approved Federal Facilities Plan in place prior to assuming control of the fuel facilities. Such a plan includes an oil spill prevention and response plan. The Service would acquire the Navy's oil spill response equipment.

#### **4.1.3 Air quality/noise**

Under alternative 1, there would be a low level of emissions from burning on the Refuge, and no noise related to airplanes.

Under alternative 2, there would be some emissions related to Refuge operations. Emissions would be in compliance with EPA regulations and air quality would be maintained. Airplanes would result in some noise on the Refuge during takeoffs and landings.

### **4.2 Social and economic environment**

#### **4.2.1 Population**

Under alternative 1, the population would be made up of a small number of Service employees and close cooperators. The population would be approximately 4 to 10 residents.

Under alternative 2, the population would not exceed 250 people. This would be a reduction from the historical and current population levels.

#### **4.2.2 Employment and economic opportunities**

Under alternative 1, there would be only a small number of jobs at Midway Atoll.

Under alternative 2, there would be approximately 150 jobs available at Midway including Refuge positions and MPC positions, and private enterprise would benefit. The island of Kauai would likely benefit from visitors arriving and departing from Lihue Airport. Visitors to Midway might also visit Oahu and other Hawaiian islands.

#### **4.2.3 Land use**

Under alternative 1, land use would be low-level Refuge management. Under alternative 2, the land use at Midway Atoll would be high-level Refuge management.

#### 4.2.4 Public use

Under alternative 1, there would be extremely limited public use. The public would not be able to view or enjoy natural and historic resources at Midway Atoll. This alternative represents a reduction in opportunities for the public to see and view the unique natural wildlife and historical resources at Midway Atoll since currently Navy personnel and contractors, and Service cooperators and staff have access to the island and can gain an understanding of and appreciation for these resources.

Under alternative 2, a public use plan would be implemented which would allow the public to see, enjoy, and learn about the unique natural and historic resources at Midway Atoll. This alternative represents an increase in opportunities for compatible public use. Under alternative 2 certain uses would stop including spearfishing for lobsters and octopus, shoreline fishing, and bottomfishing.

#### 4.2.5 Archaeological and historical resources

Under alternative 1, the Service would need to reduce the number of standing historic buildings to diminish wildlife entrapment hazards. Maintenance of buildings is labor intensive and costly and would be limited to the few required by the Refuge.

Under alternative 2, an increased number of historic buildings, structures, and objects would be maintained and reused. Additionally, opportunities for the public would be enhanced by providing opportunities for public access. The public would be able to see, enjoy, and gain insights into some aspects of World War II in the Pacific, and other chapters in Midway's history.

### 4.3 Biological environment

#### 4.3.1 Native vegetation communities

Under alternative 1, native vegetation communities could be displaced by invasive alien plants if control programs were not effective.

Under alternative 2, native vegetation communities could be enhanced through successful habitat management programs.

#### 4.3.2 Migratory birds

Under alternative 1, migratory birds would be adversely affected by a low level of management. Habitat quality could be reduced if habitat enhancement programs were not effective. Under alternative 1, there would be a minimal level of human disturbance to migratory birds.

Under alternative 2, migratory birds would benefit from a high level of natural resources management. There would be some human disturbance associated with Refuge programs. Expected adverse effects include bird airstrikes by airplanes, and disturbance from humans on the refuge. There is expected to be some interactions between fishing and migratory birds at sea that tend to dive after lures. The Service has carefully designed Refuge operational and public use programs in order to minimize adverse effects to migratory birds. These efforts include carefully controlling public activities around migratory birds (including closed areas), recommended flight patterns, carefully guided grounds maintenance programs, educational briefings and information, and guidance for fishing vessel operators to minimize interactions and prevent harm to migratory birds.

### **4.3.3 Endangered and threatened species**

Under alternative 1, there would be a reduction in the level of recovery actions that could be implemented at Midway Atoll. There would be an extremely limited number of opportunities for cooperative research and cooperative natural resources management programs. The Service would not be able to support National Marine Fisheries Service recovery efforts on nearby Kure Atoll based out of Midway Atoll.

Under alternative 2, endangered and threatened species would benefit from a high level of Refuge management that would allow for continued protection and recovery programs. Under alternative 2, there would be some human disturbance. The Service completed an intra-Service section 7 consultation and an informal consultation with the National Marine Fisheries Service on the proposed programs on the basis that there are several listed species that may be affected by the proposed action.

Guidelines incorporated into the program that would prevent adverse effects to listed species include the following: 1) public use would be carefully controlled, particularly around endangered species; 2) during the full public use program, certain areas of the Refuge would be closed to general access including most beaches at Sand Island and all beaches on Eastern Island. However, during the interim development phase, public use of most beaches at Sand Island would be permitted, but visitors would be fully informed how to behave around listed species; 3) there would be a high level of public education that would be incorporated in all activities on the Refuge; 4) public use of lagoon areas (for diving, snorkeling, and fishing) would be conducted in such a way as to prevent interactions with listed species, and to prevent habituation of monk seals to vessels and human activities; 5) the Service and the National Marine Fisheries Service would monitor the effects of the low-level public use to refine programs for the full public use program; 6) lagoon fishing would be conducted with artificial lures and barbless hooks; and fishing for lobsters

and octopus and bottomfishing would be discontinued. The proposed cooperative agreement allows continual refinements to be made to the public use program and the Refuge operations program for the benefit of listed species and other native wildlife, and to ensure Refuge compatibility.

Based on these guidelines and other ongoing Refuge efforts, the Service received intra-Service concurrence with its determination that the proposed Refuge logistics and operations support program and public use program would have a beneficial effect on the green sea turtle. The Service received a determination of no adverse effect on endangered species under the purview of the National Marine Fisheries Service.

### **4.3.4 Conservation of native biological diversity**

The low level of Refuge management provided under alternative 1 would have negative effects on native wildlife. Nonnative invasive plant species would likely replace native strand species without adequate control measures. Nonnative predators (such as rats), would also, under a low level of control, have adverse effects on native species.

The high levels of natural resources management provided under alternative 2 would help to ensure the long-term conservation of native species that occur on the atoll. Although fishing would be allowed, it would be conducted in a manner that would sustain the fishery resources and prevents adverse impacts to migratory birds.

### **4.3.5 Control of harmful nonnative species and prevention of introductions of nonnative pests**

Under alternative 1, there would be a reduction in the effectiveness of nonnative species control. With a reduction in human traffic, there would also be a reduction in the potential for additional introductions of nonnative species.

## Section 4. Environmental Consequences

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The Service and MPC are well aware of the need to prevent introductions of nonnative species on the Refuge. Under alternative 2, effective alien species control programs would be implemented to control harmful nonnative species. Although there would continue to be human traffic to the island, the alien species management plan would provide for pre-departure screenings of baggage, airplanes, and vessels to prevent introduction of additional alien species. Visitors and new employees would be informed about how to clean shoes, clothing, and baggage in order to prevent accidental introductions. An ongoing high level of vigilance on the part of Refuge staff would help to detect and control any new harmful species at an early stage.

### 4.4 Other effects

#### 4.4.1 Public safety

Under alternative 1, there would be no on-island medical services and only a limited emergency response capability out of Midway Atoll.

Under alternative 2, medical services would be available at Midway Atoll and emergency response times would be greatly shortened because of the ability of U.S. Coast Guard support at Sand Island and the availability of MPC aircraft for medical emergencies. A Refuge public safety plan would be developed to address health and safety issues and to provide a response plan for residents and visitors at Midway Atoll.

#### 4.4.2 Relationship of short-term uses and long-term productivity

The decision to operate the Refuge under a low-level management scenario, as proposed under Alternative 1, could reduce the populations of wildlife on the island over time. Some historical properties would be lost under this alternative.

Under alternative 2, natural and historic resources would be protected for the long term. The public use program would allow the natural and historic resources of Midway to be enjoyed by multiple generations.

#### 4.4.3 Irreversible and irretrievable commitments of resources

Under alternative 1, the Service would need to negotiate with the Navy for the demolition of all buildings not required for the reduced level of Refuge management. This would prevent future uses of these facilities. If any of these facilities were historic resources, it would also prevent future enjoyment or study of these buildings. The closure of the airport support facilities would also be irreversible because equipment and facilities that are currently on-island would be too expensive to procure at a later date.

Under alternative 2, there would be no irreversible or irretrievable commitments regarding resources that would make them unavailable in the future.

#### 4.4.4 Cumulative effects

Under alternative 1, there could be a decrease in wildlife production and a decline in habitat quality on land if Refuge management programs were not effective. Because the Service would not enjoy a high level of logistics support, natural resources at neighboring Kure Atoll, could also decline through fewer opportunities for access and management program support.

Under alternative 2, cumulative effects would be beneficial as they include long-term protection of natural and historic resources, and increased public visibility that could result in greater support and funding for Service programs at Midway and at other sites in the Northwestern Hawaiian Islands. Refuge operations support at Midway Atoll could benefit State of Hawaii natural resources management at Kure Atoll. Biological monitoring, interagency coordination, and the ability to adjust programs on the Refuge would also help to ensure that there would be no adverse cumulative effects.

Section 4. Environmental Consequences

Table 4-1. Summary of the Environmental Consequences of the Alternatives

RESOURCE OR ISSUE	ALTERNATIVE	
	Alternative 1. No Action. Low level of logistical and operational support and no public use program	Alternative 2. High level of logistical and operational support and compatible public use program
<b>EFFECTS ON THE PHYSICAL ENVIRONMENT</b>		
Soils	Increased erosion likely	Erosion prevention through native plant restoration
Water quality	No sewage effluent	Potential for effects from vessel traffic
Air quality	Some emissions	Some emissions
<b>EFFECTS ON THE SOCIAL AND ECONOMIC ENVIRONMENT</b>		
Population	Approximately 4 to 10 persons	No more than 250 persons
Employment	Approximately 4 to 10 jobs	Approximately 150 jobs
Land use	Low level Refuge management	High level Refuge management
Public use	No public use under alternative 1	Public use is a main feature of alternative 2
Historic resources	Removal of buildings; no opportunity for public visitation	Buildings maintained and reused; opportunities for public viewing and interpretation
<b>BIOLOGICAL ENVIRONMENT</b>		
Native natural communities	Possible decline due to invasive plants	Long term protection and enhancement
Endangered and threatened species and critical habitat	Extremely low level of protection and reduced recovery potential	Long term protection and good potential for recovery
Native biological diversity	Extremely low level of protection with possible decline	Long term protection and conservation
Control of harmful nonnative species	Extremely limited control	Long term effective control

RESOURCE OR ISSUE	ALTERNATIVE	
	Alternative 1. No Action. Low level of logistical and operational support and no public use program	Alternative 2. High level of logistical and operational support and compatible public use program
<b>EFFECTS ON THE PHYSICAL ENVIRONMENT</b>		
<b>OTHER CONCERNS</b>		
Public safety	No medical services or emergency response available	Continued availability of medical services and emergency response
Relationship of short-term uses and long-term productivity	Low-level natural resources management could reduce native populations and native biodiversity	High level natural resources management would protect native wildlife and native biodiversity over the long term
Irreversible and irretrievable commitments of resources	Demolition of additional buildings would prevent future uses; alternative 1 would effectively close air services support for the future	None
Cumulative effects	Loss of aircraft logistics and support services would result in reduced ability to provide wildlife management and natural resources protection at Midway and other northwestern hawaiian islands; no incidental benefits to conservation from public education	Cumulative effects would be positive for wildlife and historical resources through long-term Refuge management; the public would have access to and gain an increased appreciation for the significant natural and historic resources at Midway Atoll; public visibility could increase support and funding for Service programs; the Service could provide cooperative support to State at Kure Atoll

## 5 Section 5. List of Preparers

### 5.1 Preparers

#### **Environmental Assessment and Summary of Cooperative Agreement**

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#### **Public Use Plan**

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### 5.2 Reviewers

This environmental assessment incorporates the special expertise of refuge managers, public use specialists, recovery biologists, natural resources managers, marine biologists, marine mammal specialists, fisheries experts, ornithologists, researchers, and educators. Through their reviews and discussions, the following persons contributed substantially to the environmental assessment and the proposed Refuge support and public use programs:

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Elizabeth Flint, Wildlife Biologist, Pacific/Remote Islands National Wildlife Refuge Complex, Honolulu, Hawaii

Kim Forrest, Deputy Refuge Manager, Sacramento National Wildlife Refuge, Sacramento, California

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Dent Thompson, Vice-President, Midway Phoenix Corporation, Cartersville, Georgia

Dave Woodside, Maintenance Worker, Division of Ecological Services, Honolulu, Hawaii



## Section 6. List of Agencies, Organizations, and Persons Consulted

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**U.S. Environmental Protection Agency**  
Pacific Islands Contact Office

### **6.2 Hawaii State and County Agencies**

Governor Benjamin Cayetano  
Office of the Governor  
Office of State Planning  
Office of Environmental Quality Control  
Office of Hawaiian Affairs  
Department of Business, Economic Development and Tourism  
Department of Education, State Main Library  
Department of Land and Natural Resources  
Historic Preservation Office, Honolulu  
Division of Forestry and Wildlife  
Division of Aquatic Resources  
State Legislature  
Legislative Reference Bureau  
University of Hawaii  
Hamilton Library  
Sea Grant Extension Service  
Secretariat for Conservation Biology  
Mayor, County of Kauai

### **6.3 Private Conservation Organizations**

Endangered Species Recovery Council  
Hawaii Audubon Society  
Hawaii Nature Center  
Hawaii's Thousand Friends  
International Bird Rescue Research Center  
International Midway Memorial Foundation  
National Audubon Society  
National Tropical Botanical Garden  
Oceanic Society Expeditions  
Pacific Atoll Marine Preservation Society  
Sierra Club Legal Defense Fund  
Sierra Club, Hawaii Chapter  
The Nature Conservancy of Hawaii  
The Peregrine Fund, Inc.  
Wildlife Society, Hawaii Chapter

### **6.4 Others**

Hawaiian Monk Seal Recovery Team  
Marine Mammal Commission

## **6 Section 6. List of Agencies, Organizations, and Persons Consulted**

The draft environmental assessment was distributed to the following agencies, organizations, and individuals:

### **6.1 Federal agencies**

#### **U.S. Congressional Delegation**

Senator Daniel K. Akaka  
Senator Daniel K. Inouye  
Representative Patsy T. Mink  
Representative Neil Abercrombie

#### **U.S. Department of Agriculture**

Animal Damage Control, Honolulu  
Natural Resources Conservation Service, Honolulu  
U.S. Forest Service, Institute of Pacific Islands Forestry, Honolulu

#### **U.S. Department of Commerce**

National Oceanic and Atmospheric Administration, National Weather Service  
National Oceanic and Atmospheric Administration, National Marine Fisheries Service  
Western Pacific Regional Fishery Management Council

#### **U.S. Department of Defense**

U.S. Navy, Deputy Assistant Secretary of the Navy, Conversion and Redevelopment, Washington, D.C.  
U.S. Navy, BRAC Coordinator, Pearl Harbor, Hawaii  
U.S. Navy, Officer in Charge, Midway

#### **U.S. Department of the Interior**

Fish and Wildlife Service  
Assistant Regional Director, Pacific Ecoregion, Portland, Oregon  
Regional Archaeologist, Division of Refuge Operations Support, Region 1, Portland, Oregon  
Field Supervisor, Division of Ecological Services, Honolulu  
Project Leader, Hawaiian/Pacific Islands National Wildlife Refuge Complex, Honolulu  
Special Agent In Charge, Division of Law Enforcement, Honolulu  
Fish and Wildlife Biologist, Pacific Islands Federal Aid Office, Honolulu, Hawaii  
Refuge Manager, Hawaiian/Pacific Remote Islands National Wildlife Refuge Complex, Honolulu  
Refuge Manager, Midway Atoll National Wildlife Refuge  
Refuge Biologist, Midway Atoll National Wildlife Refuge  
National Biological Service  
Pacific Islands Science Center, Honolulu  
Station Leader, Hawaii Cooperative Fishery Research Unit, Honolulu  
Station Leader, Hawai'i Research Station, Volcanoes  
National Park Service, Pacific Area, Honolulu  
Advisory Council on Historic Preservation

#### **U.S. Department of Transportation**

Coast Guard, 14th Coast Guard District  
Federal Aviation Administration, Honolulu

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## Appendix A. Glossary

**Alien species.** A species of plant or animal that is not native to Hawaii. [Same as introduced, nonnative, or exotic.]

**Biological diversity or biodiversity.** The full range of variety and variability within and among living organisms and the ecological complexes in which they occur. Biological diversity encompasses ecosystem processes, species diversity, and genetic variation. (ORS 273.563) Biological diversity of native species is discussed in this environmental assessment.

**Ecology.** The study of the interrelationships which exist between organisms and their environment.

**Ecosystem.** An assemblage of animals and plants and its interaction with the environment.

**Ecotourism.** Tourism specifically targeted at gaining an increased understanding and appreciation for an area's natural resources.

**Element.** A plant, animal, or natural community (collectively known as the elements of biological diversity).

**Endangered species.** A species officially recognized by Federal and State agencies to be in immediate danger of extinction throughout all or a significant portion of its range.

**Endemic species.** A species occurring naturally in a particular locality. Many of Hawaii's native plants and animals are endemic to the Hawaiian islands. Some endemic species are restricted to a single island, mountain range, or even gulch.

**Endemism.** The extent to which the plants and animals of a region are unique to that region.

**Environment.** The sum of all external conditions and influences affecting the development and life of organisms.

**Extinct species.** Those species no longer known to exist after repeated search.

**Extirpation.** Local extinction: a species or subspecies disappearing from a locality or region without becoming extinct throughout its range.

**Fauna.** The animal life of an area.

**Feral.** Formerly domesticated animals reverted to the wild state or living in wild habitat.

**Flora.** The plant life of an area.

**Genus.** A taxonomic category that includes groups of closely related species; the principal subdivision of a taxonomic family.

**Habitat.** The physical environment in which a plant or animal lives.

**Imperiled species.** A rare species that is threatened with extinction.

## Appendix A. Glossary

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**Indigenous species.** A species that occurs naturally at a location, but that has a wider occurrence outside of that location.

**Native species.** A species that occurs naturally in a particular locality. Includes endemic and indigenous species.

**Natural community.** An assemblage of plants and animals occurring together at a site. Because of unique environmental requirements and direct and indirect interactions among species, natural communities can be quite distinctive. Classification of native natural communities are generally based on moisture regime, canopy closure and height, and dominant species and constituent species. See Wagner *et al.* (1990) for a formal summary of the Hawaiian Natural Community Classification. "Native" natural communities are based on a composition of at least 60 percent native plants. Nonnative natural communities are based on a composition of only 40 percent native plants.

**Naturalized species.** Refers to introduced species that are now thoroughly established and spreading in the wild without help by humans.

**Population.** A group of organisms occupying a specific geographic area.

**Rare species.** A species that occurs in such small numbers, throughout its range, that it may become threatened with extinction if its environment worsens.

**sp.** An abbreviation for species.

**Species.** A taxonomic category ranking immediately below a genus and including closely related, morphologically similar individuals which actually or potentially interbreed.

**spp.** An abbreviation for more than one species.

**ssp.** An abbreviation for a subspecies.

**Subspecies.** [ssp.] A geographically defined grouping of local populations which differs taxonomically from similar subdivisions of species.

**Taxon.** A taxonomic entity.

**Threat.** Any one of a number of situations or actions that causes harm

**Threatened species.** A species officially recognized by Federal or State agencies to be in immediate danger of extinction throughout all or a significant portion of its range.

**var..** An abbreviation for a variety.

**Variety.** A taxonomic group or category inferior in rank to a subspecies.

**Viable.** Capable of persisting and reproducing naturally under favorable conditions.

**Wildlife.** Plant and animal components of the environment.

## Appendix A. Glossary

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### Sources:

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## **Appendix B. Summary of Proposed Refuge Logistics and Operations Support Program**

This describes the proposed refuge logistics and operations support program for the Midway Atoll National Wildlife Refuge (Refuge). Refuge logistics and operations support activities would be conducted under an agreement between the U.S. Fish and Wildlife Service (Service) and Midway Phoenix Corporation (MPC). This summary is based on the Service's request for proposals (USFWS 1995), the Midway Phoenix Corporation's solicitation (MPC 1995), and provisions of the cooperative agreement.

### **I. General and Administrative**

#### **A. Summary of agreement provisions**

The proposed agreement for Refuge support services was developed by Service contract specialists in close coordination with Service administrators and Refuge managers. The proposed term of the agreement is 20 years which would allow MPC to recover its investment in upgrading and operating the island infrastructure and facilities. MPC would be insured and would indemnify the United States of America against any claims arising out of its activities including those of its staff, members of the public participating in the public use program, and transients with permission from MPC to arrive at the atoll (e.g., transient air travelers, delivery vessel crews, etc.). MPC would carry property insurance, public liability (including bodily injury, protection and indemnity for watercraft, automobile liability, aircraft liability), and a performance bond. MPC would not be liable for Service actions. Similarly, the Service would be liable for claims arising out of the activities of its staff, cooperators (e.g., Coast Guard, NMFS, hosted guests), and volunteers. The agreement specifies roles and responsibilities and other details of day-to-day operations.

#### **B. Capabilities and understandings**

Midway Phoenix Corporation was selected from among two respondents to the Service's Request for Proposals. The company has proven expertise with operating aircraft support bases and maintaining aircraft; providing transport, logistic, and cargo support services; and has a record of quality service. Clients include the Department of Defense (U.S. Navy and U.S. Air Force), NATO, Boeing Defense and Space Group, and other private companies. Midway Phoenix Corporation has a commitment to "direct special attention in all [its] operations for the promotion, preservation, protection, and interpretation of refuge resources and the environment" (MPC 1995, page C-9). In addition to funding operations and support programs, a portion of the income from the public use program would go towards refuge management programs.

#### **C. Service staff requirements**

The Service anticipates needing additional employees to administer the Service's portion of the agreement. In addition to the existing duties of the refuge manager and refuge wildlife biologist, the additional staff would help to oversee the agreement, supplement refuge management efforts, and support the public use programs including volunteer coordination.



#### **D. Midway Phoenix Corporation staff requirements**

MPC would hire a program manager and a secretary to oversee the project at Midway. Other staff include professional and technical staff to run facilities and equipment, and support staff to carry out such work as food services, landscaping, and lodging and general maintenance duties. A total of 120 staff are required for the Refuge logistics support and operations support program including public use support.

#### **E. Location and land use**

The majority of the logistics and operations support activities would take place on Sand Island, Midway Atoll (figure B-1). Public use programs would take place on Sand Island, Eastern Island, and in and on the waters of the Refuge. The primary land use is Refuge management (which includes operations and support activities and public use). Refuge management programs on Midway Atoll National Wildlife Refuge are guided by an approved Refuge Management Plan (USFWS 1991).

#### **F. Island population**

The total population would not exceed 250 persons except during short overlaps of arrival and departure of individuals via aircraft or vessels. Population under the proposed alternative would consist of approximately 20 Service employees, volunteers, and cooperators (including up to 16 intermittent Coast Guard personnel), 120 MPC staff, and 100 visitors. Any proposed changes to the population maximum would require additional compatibility and environmental review.

#### **G. Orientation**

Newly arriving island residents and visitors would be given a briefing emphasizing Refuge mandates, programs, and purposes. Briefings and information packets would include guidelines for public use such as methods of minimizing disturbance to wildlife and historical resources, regulations regarding wildlife, and penalties for violations.

Public use on the Refuge (including off-duty Refuge employees and other island residents) would be guided by the public use plan (see appendix C of the *Final Environmental Assessment for the Proposed Refuge Logistics and Operations Support Program and Public Use Program, Midway Atoll National Wildlife Refuge* (USFWS 1996)). The public use plan controls access by the public by designating open and closed areas, specifying permitted uses, and providing other guidelines that designed to minimize adverse impacts of human activities on wildlife, protect public health and safety, and ensure compatibility with Refuge management programs.

## **H. Public relations and other coordination**

Ongoing professional public interface and positive public relations on refuges are important because they build public support for Service programs. Therefore, all actions that would reflect on the Service's public image would be coordinated through a designated Service representative. MPC would be responsible for coordinating all advertisements, public relations, and educational materials with the Service for review. MPC would support public outreach efforts of the Service. Weekly coordination meetings between the Service and MPC staff will ensure close cooperation between the parties. Annual meetings among the Service, MPC, and close cooperators, will also enhance communication, cooperation, and coordination, and will provide an opportunity for refining Refuge programs.

## **I. Other concerns**

### **1. Prevention of nonnative alien species introductions**

The inadvertent introduction of invasive, nonnative noxious plants or animals is of great concern, and the Service desires the highest levels of vigilance be maintained to prevent infestations. An alien species prevention plan will be developed for the Refuge. Provisions of the plan include educating visitors through early information packets on how to clean clothing and gear, pre-departure baggage inspections, and pest-free certification requirements for vessels. In order to prevent introductions of nonnative species to Midway Atoll or other atolls in the northwestern Hawaiian Islands, vessels will be required to participate in a vessel monitoring system which will track vessels to ensure they do not enter the waters of other Refuges, and to prevent unauthorized landings.

### **2. Public health and safety**

MPC and the Service will develop a comprehensive Refuge safety plan.

### **3. Law enforcement**

The Service has the responsibility for law enforcement on the Refuge. Refuge personnel would take immediate action to protect wildlife and enforce wildlife laws and public use regulations. On-the-spot interdiction actions may range from casual discussions to stop the violation and educate the person about the reasons for the regulation, to issuing a "Notice of Violation", implementing other restrictions, to possible immediate removal from the Refuge.

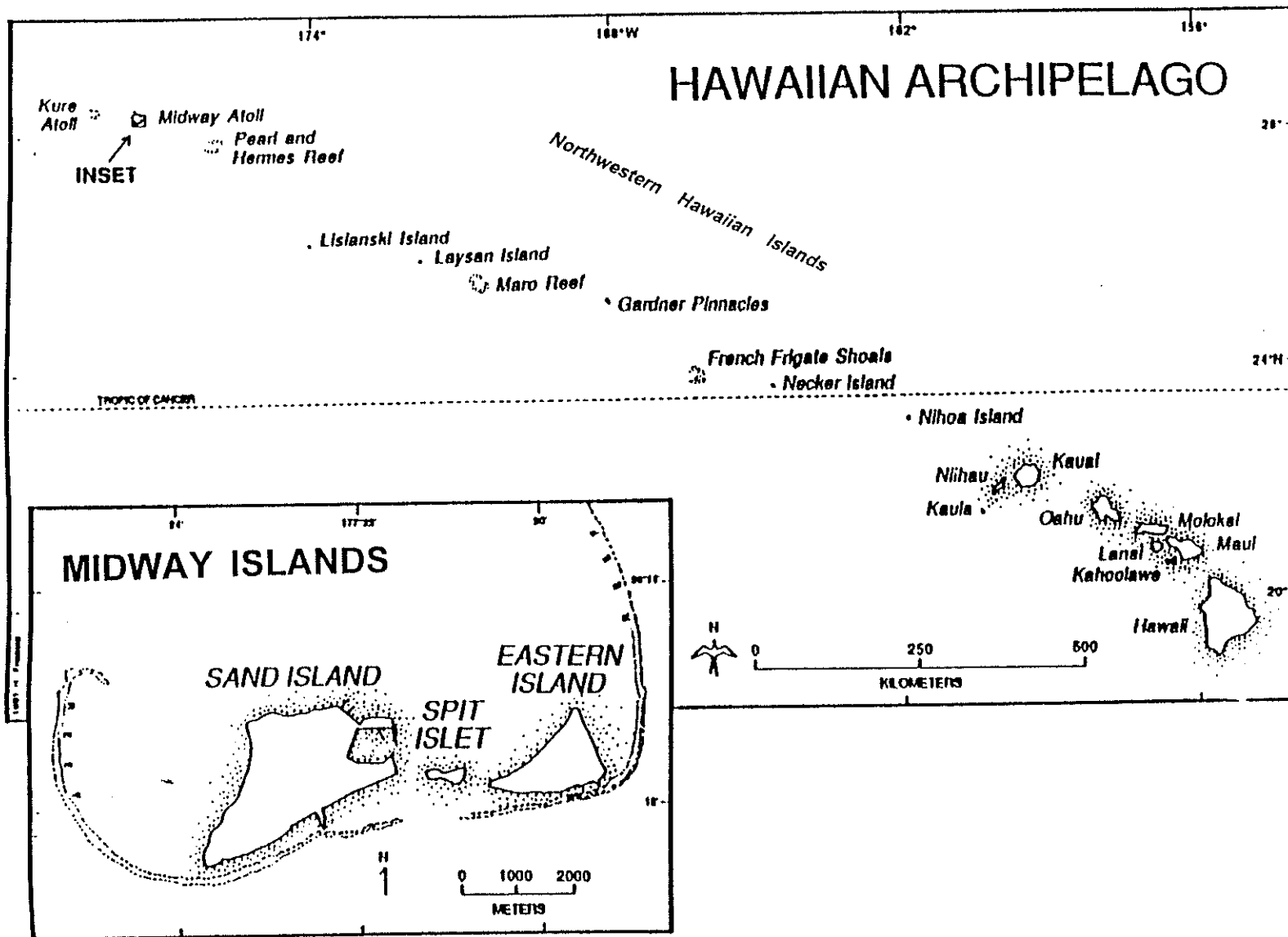


Figure B-1. Location of Midway Atoll National Wildlife Refuge, northwestern Hawaiian Islands.

## II. Logistics

### A. Refuge air support

MPC would provide round trip air transportation of personnel, supplies, equipment, and monk seals or other cargo between Honolulu and Midway on as necessary to support Refuge operations.

### B. Air operations

MPC would fly aircraft to and from Midway, provide air traffic control and flight following, and on-island aircraft maintenance and refueling services. MPC would operate Gulfstream G159's (19-passenger airplanes) on a regular basis. The Coast Guard would continue to operate C-130's in and out of Midway Islands. Refueling of transient aircraft would be allowed on a case-by-case basis to be determined by MPC within the guidelines of the cooperative agreement. Visitor flights would depart from the Lihue Airport on Kauai. All air operations would be in compliance with Federal Aviation Administration regulations. All aircraft and pilots used in the Refuge support program would be certified by the Department of the Interior's Office of Aircraft Services. MPC would fly around 8 flights each week with a maximum of 30 aircraft landings allowed on a weekly basis. Other aircraft that may land at Midway Atoll such as pre-approved excursions involving corporate jets, private charter flights, or airplane ferry flights across the Pacific, as well as emergency landings of private airplanes, occasional support of military airflights, and emergency commercial jet landings. Midway airport would not be billed as a destination airport and is so remote that transient and intermittent air traffic is expected to be nominal. No air tours are proposed to originate from Midway Islands.

*Environmental concerns:* Bird air strikes are a concern from a public safety, airflight operations and public relations, and wildlife management standpoints. MPC and the Service would work cooperatively to minimize bird strikes. Other concerns include disturbance to certain migratory bird species that flush in large flocks (e.g., sooty terns), and the potential for the introduction of nonnative pest species from visitors and incoming aircraft. Safe handling, storage, and fuels is of concern (see section III.B.).

*Provisions to address environmental concerns:* The relatively small size of Gulfstream G159's would reduce the potential for a bird air strike, as compared with the larger C-141's currently regularly landing at Midway Islands. As many flights as possible would be scheduled after sundown or before sunup when seabirds are less likely to be aloft. Aircraft would be directed to avoid overflying Eastern Island where the largest sooty tern colonies exist. Other preventive measures include developing appropriate handling methods for sweeping the runways, and the construction of berms along runways to prevent albatross chicks from wandering onto runways. To prevent alien species introductions, passengers and their baggage would undergo agricultural inspection and all arriving airplanes would require pest-free certification before being allowed to land at Sand Island. Airplanes having passed through or originating from islands with brown tree snakes would be allowed to land at Midway Atoll only when procedures have been put in place that would ensure vigilant inspection upon departure and after landing to prevent any possibility of introduction of this extremely threatening pest.

### C. Vessels

MPC would initially operate two diesel powered sportfishing boats (approximately 38-foot long), and a number of diving boats (e.g., boston whaler type boats or inflatable motor boats) that would also be used for tours to Eastern Island, a tugboat, and a military landing craft. Other vessels may include occasional visits from National Marine Fisheries Service research vessels and Coast Guard buoy tenders and cutters. Private sailboats and motor yachts would be allowed to sail to Midway Atoll only as preregistered participants of the public use program. Sailboats and motor yachts would be moored to permanent mooring buoys in the harbor, but would not be allowed to cruise the lagoon. Commercial vessels and other private vessels would not be allowed to call at Midway Atoll unless they were operating as part of Refuge programs.

*Environmental concerns:* Concerns relating to vessel traffic include the safe operation of the vessels to prevent shipwrecks; prevention of vessel-wildlife interactions; protection of the seafloor and coral from anchor damage; protection of water quality from bilge pumping; the potential for introduction of nonnative pest species; and possible trespass to other remote islands in the northwestern Hawaiian island chain. Sensitive wildlife resources on other remote islands are extremely vulnerable to the introduction of nonnative pest species such as rats and invasive plants. Human disturbance to wildlife on these areas is also a concern. The prevention of an oil spill disaster is also of serious concern (see section III.B.)

*Provisions to address environmental concerns:*

General To prevent transient visitors to the atoll, it will be very clear that only those vessels with prior permission would be allowed to enter the waters of Midway atoll. All vessels would be requested to enter and leave the atoll by daylight to prevent shipwrecks. Vessel operating speed limits within the channel and harbor would be established to avoid harming wildlife (such as sea turtles or monk seals) occurring in those areas. Vessels are required to originate in the main Hawaiian islands.

Private sailboats Private sailboats and motor yachts would only be allowed to sail to Midway Atoll as preregistered participants of the public use program. All private vessels would be required to have a Coast Guard inspection to document seaworthiness, a pre-departure agricultural and customs inspection, and be certified pest-free. The Service and MPC are developing a vessel monitoring system that would be required of all visiting passenger vessels to prevent trespass into the waters of or onto islands of other remote atolls. Visiting sailboats would not be allowed to empty bilges in the waters of the atoll and environmentally safe indicator tablets would aid in detection. All vessels would be required to have Coast Guard approved sewage systems. Vessel-generated waste handling would be included in the Refuge waste stream management program. Private vessels would anchor at permanent mooring buoys in the harbor.

Transport barges, research vessels Refuge support vessels would require pest-free certification. In a continuation of the current practice, a harbor pilot would be required to pilot large vessels into the channel. Safe transport of oil is covered in section III.B.

Public use program vessels Refuge operation plans would include requirements for boat captain licensing, certification, and orientation/training requirements; open and closed areas for diving, fishing, and wildlife tours; designated anchor areas; safe boating operating procedures; reporting requirements; and other provisions to provide environmentally sensitive boat operations on the Refuge. During the development phase, off-limits zones will be established in the lagoon to reduce impacts to monk seals.

### III. Description of Facilities Operations and Maintenance

Figure B-2 is a map of Sand Island showing the location of infrastructure.

#### A. Airfield and terminal

MPC would provide support for all inbound and outbound flights and would maintain the airfield and terminal. MPC would operate and maintain the airfield in compliance with applicable Federal regulations and departmental requirements.

*Concerns:* Effects of airfield operations on seabirds.

*Provisions to address environmental concerns:* In addition to preventing bird strike hazards already discussed, runways would be maintained to prevent seabirds from nesting on the surface. Berms may be established adjacent to the runway to prevent chicks from wandering onto runways. Operating procedures would be refined to ensure environmentally sensitive operations.

#### B. Fuel farm operations and maintenance

Delivery and storage of petroleum products would be required for the operation of the Refuge and for support of cooperators such as refueling of Coast Guard aircraft and vessels and NOAA and Service vessels. An estimated 1,000,000 gallons of fuel will be required each year, to be delivered in 500,000-gallon lots two times a year. Fuel types required would be JP-5, unleaded regular gasoline, and diesel fuel. Fuel would be stored in above-ground storage tanks in a secured fuel tank farm area on Sand Island.

*Concerns:* Safe transport, storage, and handling of fuels is of concern to protect human health and safety and the environment.

*Provisions to address environmental concerns:* Operations and maintenance of the fuel storage facilities and storage, transport, and distribution of fuels would meet Federal standards and other requirements prior to assumption of operations by MPC. The Service would have a Federal Facility Response Plan in place for to ensure appropriate oil spill prevention planning, and oil spill response. Additionally, the Service would direct transport barges to take a route with the minimum potential for a mishap. MPC would maintain two 1,000,000-gallon fuel tanks with the second held in reserve to handle emergencies. Access to the fuel farm would be restricted.

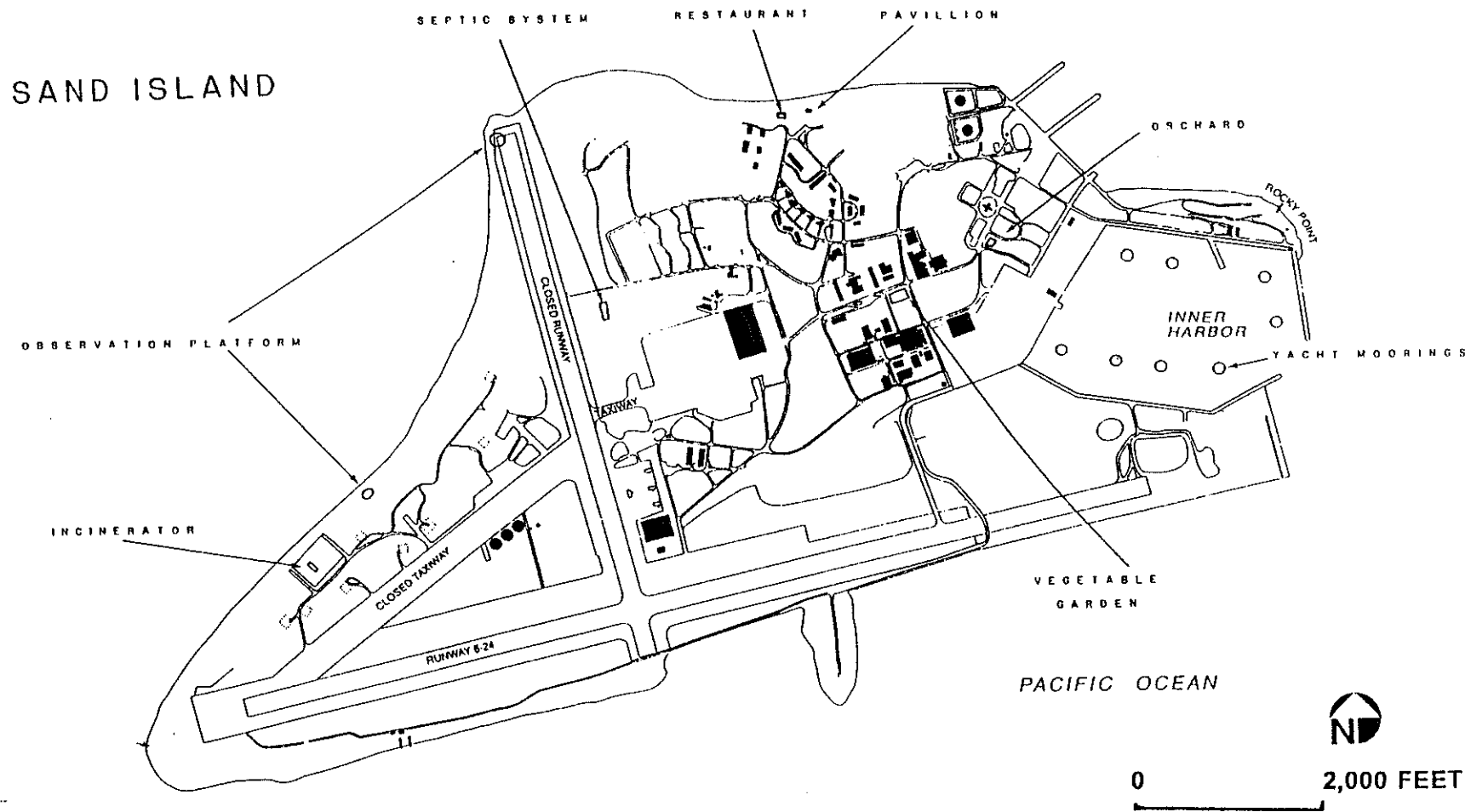


Figure B-2. Map of infrastructure locations on Sand Island, Midway Atoll.

### **C. Harbor maintenance and operations**

MPC would provide harbor maintenance and operations support including harbormaster services including scheduling, piloting large boats and barges to and from the harbor, loading and unloading, and ensuring compliance with applicable Federal regulations. The harbor can support boats of up to 10-foot draft. MPC would be responsible for maintenance of the harbor seawall, piers, and installation and maintenance of mooring bouys.

### **D. Housing, offices, storage areas, and other buildings**

MPC would maintain lodging facilities for permanent employees, volunteers, researchers, and guests. MPC would also maintain the Refuge office and research offices, a laboratory, supply storage, equipment storage (for boats, vehicles, tractors, etc.), a recreation area, a small carpentry and motor vehicle maintenance and repair shop, a dining facility, and other visitor support facilities. Maintenance of facilities would comply with applicable Federal regulations.

*Environmental concerns:* Protection of air and water quality and no generation of toxic waste.

*Provisions to address environmental concerns:* MPC would maintain exterior paint to prevent chipping and flaking of lead-based paint. Handling, storage, and disposal of toxic materials (e.g., paints, solvents, batteries, etc.) would be managed under a waste-stream management plan.

### **E. Infrastructure**

Most of the infrastructure required to support Refuge operations is already in place. MPC would upgrade and maintain infrastructure to enhance efficiency and reduce any existing adverse effects to wildlife. MPC would provide and maintain sufficient infrastructure to support the target population including freshwater collection, treatment, and distribution; sewage; electricity; intra-atoll communications and long-distance phone service; satellite television; roadways; and refuse disposal.

*Environmental concerns:* Infrastructure operations and maintenance must be environmentally sound.

*Provisions to address environmental concerns:* All operations would be conducted under the Refuge operations plan. All ground-moving operations would be coordinated with the Service to prevent, avoid, and minimize potential adverse impacts to wildlife. Improvements to existing facilities may include installation of a septic facility to replace the sewage outfall; installation of incinerator to reduce landfilling; construction of an organic landfill/burnpit; burying existing overhead cables to prevent bird casualties; and fitting outdoor lights with shields to prevent light pollution. The Refuge waste-stream management program would provide for reducing, reusing, and recycling, where possible and shipping all hazardous wastes off island.



## **F. Support services**

### **1. Medical services**

MPC would provide a medical doctor and a walk-in clinic for routine illnesses and emergencies. Medical services would be available on a fee for services basis for all island residents and visitors.

### **2. Food services**

MPC would be responsible for food procurement, preparation, storage, serving, and cleanup for the dining hall, the proposed restaurant, room service/catered meals, and pavilion barbecues. MPC would provide three meals a day in the general dining facility to station residents and visitors at costs set by MPC and the Service. MPC would also make food staples available for purchase by Service resident employees.

### **3. Vehicles and maintenance**

On-island transport for visitors would be limited to bicycles, motorized golf carts, or minivans. Other vehicles used for operational purposes would include trucks, utility vehicles, and heavy equipment. MPC would be responsible for obtaining and maintaining all vehicles (including sport fishing boats). The Service would pay the costs of any vehicle maintenance and repair it may require at established rates. To prevent nesting seabirds, low-flying birds, and fledgling birds from being run over by motor vehicles, the number of motorized vehicles would be kept to a minimum and would be driven at the posted 15 miles per hour. Motor vehicles would largely be limited to operation during daylight hours to minimize bird disorientation. Proper instruction would be given to motor vehicle operators to prevent running over or colliding with wildlife.

### **4. Grounds maintenance**

Grounds maintenance would be conducted under an approved grounds maintenance plan. The grounds maintenance plan would include integrated pest management to reduce the use of herbicides, pesticides, and fertilizers. Landscaping and habitat restoration would utilize native plants and provide for control of harmful alien species.

### **5. Recreation areas**

MPC would maintain and operate indoor and outdoor recreation facilities for visitors and permanent residents. Indoor recreation activities would include a gym, a weight room, billiards, table tennis, bowling, movie theater, and a library. Non-wildlife dependent outdoor recreation areas include a tennis court, a basketball court, bicycling, and jogging. Wildlife dependent facilities include trails, and boardwalks. Recreation is discussed in greater detail in the draft Public Use Plan (appendix C).

## IV. Proposed Renovation and New Construction

The Service intends to utilize existing facilities and infrastructure to the extent possible. However, some renovation and new construction is necessary to improve efficiency and structural integrity, and ensure long-term use of support facilities and infrastructure.

### A. Proposed renovation

1. Fuel storage tanks. MPC would to renovate above-ground fuel storage tanks to bring them into environmental compliance.
2. Buildings. MPC would renovate the interiors of dormitories, houses, and other quarters, existing recreational facilities, and offices.
3. Beach pavilion. MPC would renovate the existing beach pavilion to include a beach grill food service area. Figure B-3a shows the existing location of the pavilion and figure B-3d shows an artist's rendition of the renovated pavilion.

### B. Proposed new projects

Figure B-2 shows the proposed sites for the new projects described in this section. Where details for siting and design are not available, project-specific compliance would be completed separately.

1. Septic facility MPC would construct a septic facility to treat sewage on island instead of pumping it offshore into the lagoon. The septic plant would be located near the last pumphouse on the north sector of Sand Island (see figure B-2). The proposed facility would be approximately 355 feet long and 100 feet wide. Preliminary design features consist of six above-ground septic tanks. Sewage would be broken down through biodegradation. Treated effluent would seep into leach fields. Sludge would need to be maintained after several years and could be placed into landfills or incinerated. The septic facility would replace the existing primary effluent that is pumped into offshore waters.
2. Dining facility MPC would construct a dining facility near the existing beach pavilion (figure B-3). The facility would seat approximately 40 persons at a time for breakfast and dinner. The dining facility would reflect the Pan American clipper ship era and would complement the proposed restoration of the historic cable buildings.
3. Permanent mooring buoys Up to ten permanent mooring buoys would be installed in the inner harbor to accommodate visiting sailboats. The use of mooring buoys or sand anchors for snorkeling and diving in the lagoon would be evaluated during the development phase.
4. Outdoor showers and restroom facilities A modest outdoor shower facility with restrooms would be attached to the beach pavilion on Sand Island, and a portable comfort station would be installed on Eastern Island.

5. Burn pit/organic landfill A limited area would be required to landfill septic system sludge, sterile ash from the incinerator, ash from burning of organic debris (such as ironwood trees), and other wastes. The location of the proposed landfill has not been determined
6. Incinerator An incinerator would be installed to burn non-toxic waste on island. The proposed location for the incinerator is on the western portion of the island behind a screen of vegetation on an existing concrete foundation (figure B-2). According to preliminary systems specifications, the incinerator would have an area dimension of approximately 10-feet by 7-feet, and the stack would not exceed 20-feet. The incinerator would be situated to avoid adverse impacts to scenic viewplanes on the Refuge.
7. Interpretive boardwalk and trails system Interpretive boardwalks and trails would be developed as specified in the Refuge public use plan.
8. Fruit and vegetable production areas MPC would establish a 200-foot by 100-foot raised bed gardening area to produce vegetables for on-island consumption. Three hundred yards of certified clean (pathogen, nematode, weed-free) soil would be imported. Bio-intensive planting methods would be utilized. In most cases vegetables would be self-pollinating or wind-pollinated. A total of 24 citrus trees including grapefruit, lemon, lime, and orange would be planted in an orchard area. Banana trees may be planted as well. Fruits and vegetables must be raised on island because of weight limitations on the Gulfstream G-159 aircraft.

The Service and MPC would coordinate closely to ensure compatibility. Seedless varieties and other varieties that are not capable of becoming naturalized would be used. Integrated pest management tools would be used to control insect pests.

9. Outdoor grill/social area The proposed renovation of the beach pavilion would displace the existing informal social gathering area. A new informal grill area would be constructed on the island to replace the existing one. The location of this area and the details of design and operating guidelines are not currently available.

## V. References Cited

Midway Phoenix Corporation, 1995. *Response to Request for Proposal, Solicitation No. FWSI-95018(DB) for Providing O&M of Facilities on Midway Atoll*. Proprietary response to Service Request for Proposal.

U.S. Fish and Wildlife Service, 1995. *Request for Proposal No. FWSI-95018(DB): Provide O&M of Facilities as Required on Midway Atoll*. Public solicitation, offer and award.

U.S. Fish and Wildlife Service, 1996. *Final Environmental Assessment for the Proposed Refuge Logistics and Operations Support Program and Public Use Program at Midway Atoll National Wildlife Refuge*.

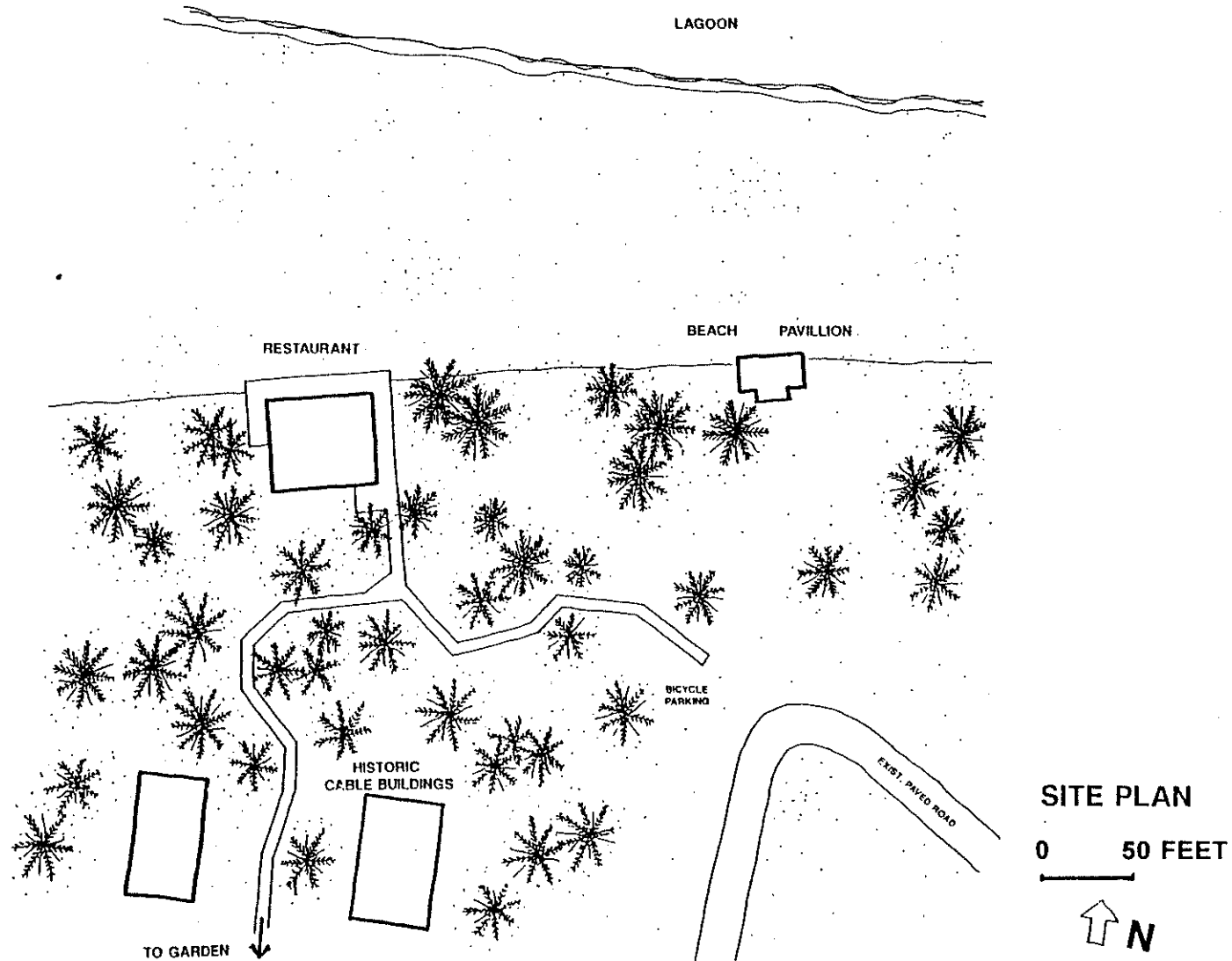


Figure B-3. Plans for the proposed dining facility and beach pavilion. 3a: proposed location map; 3b: exterior view of dining facility; 3c: floor plan of dining facility; 3d: exterior view of renovated beach pavilion.

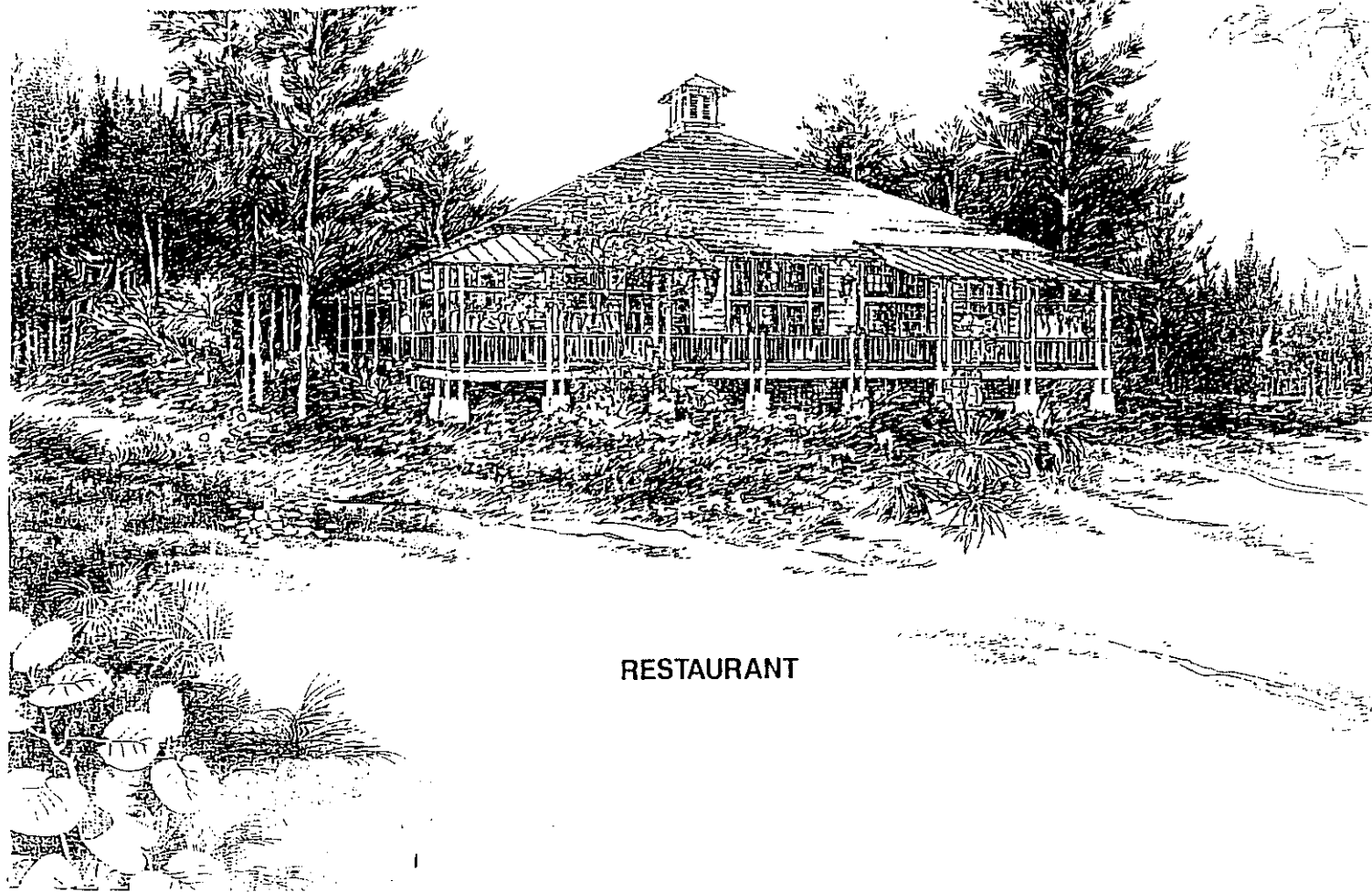


Figure B-3. Plans for the proposed dining facility and beach pavilion. 3a: proposed location map; 3b: Exterior view of dining facility; 3c: Floor plan of dining facility; 3d: Exterior view of renovated beach pavilion.

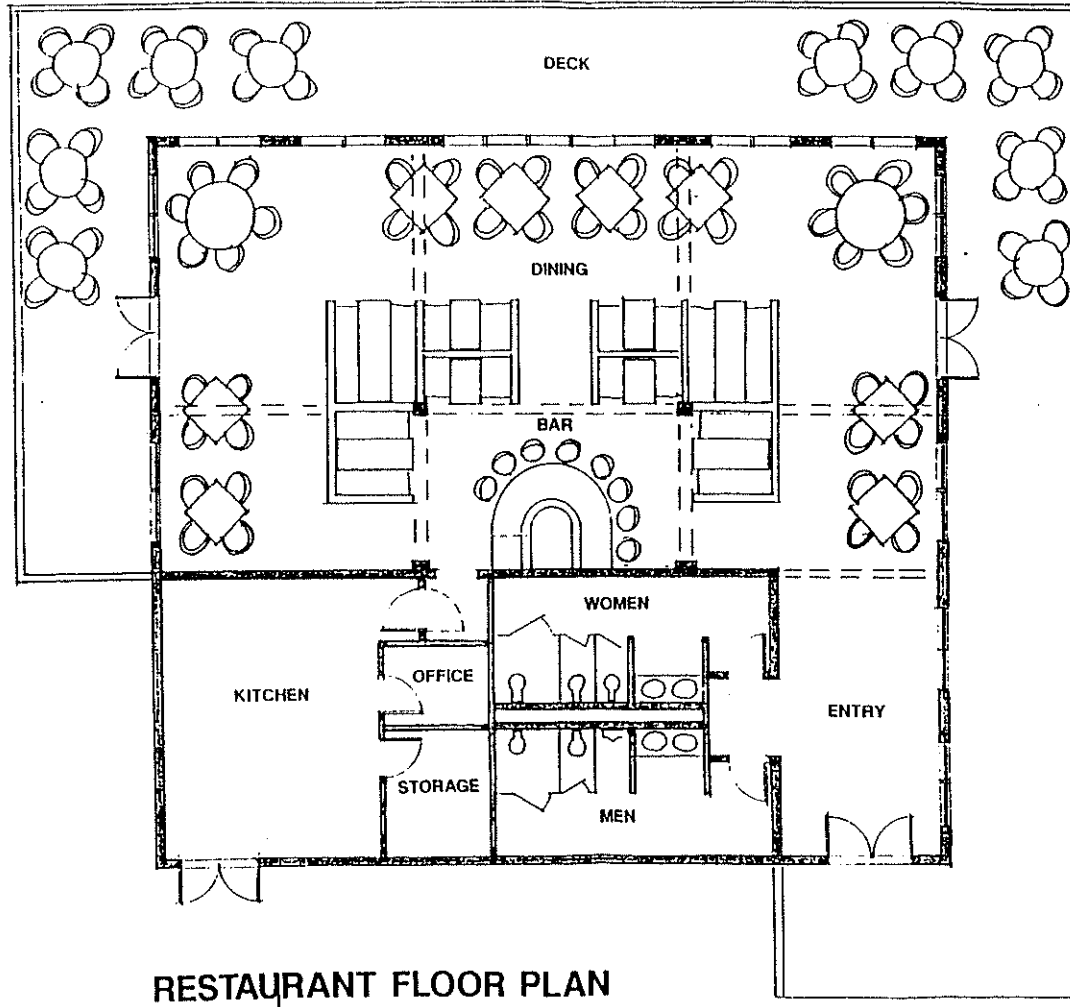
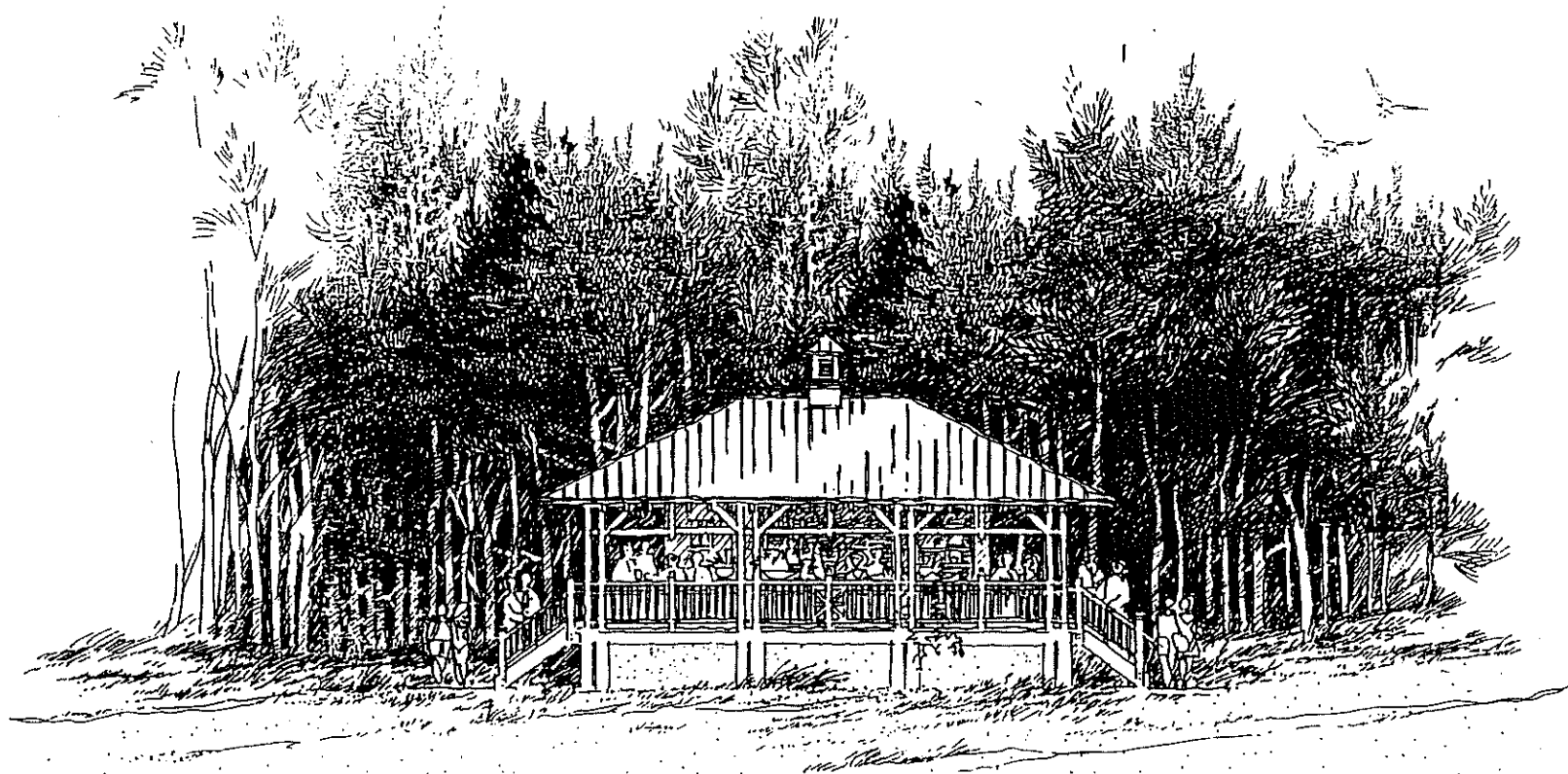


Figure B-3. Plans for the proposed dining facility and beach pavilion. 3a: proposed location map; 3b: exterior view of dining facility; 3c: floor plan of dining facility; 3d: exterior view of renovated beach pavilion.



## BEACH PAVILION

Figure B-3. Plans for the proposed dining facility and beach pavilion. 3a: proposed location map; 3b: exterior view of dining facility; 3c: floor plan of dining facility; 3d: exterior view of renovated beach pavilion.

Appendix C  
Public Use Plan

**PUBLIC USE PLAN**  
  
**for**  
  
**MIDWAY ATOLL**  
  
**NATIONAL WILDLIFE REFUGE**  
  
Pacific Islands Ecoregion  
  
U.S. Fish and Wildlife Service  
  
(April 23, 1996)



Appendix C  
Public Use Plan

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Appendix C  
Public Use Plan

I. Background

A. Purpose and Scope of the Plan

This plan is being developed to meet the needs of the opening of the Midway Atoll National Wildlife Refuge (Refuge) to public use for the first time. The management of public activities at the Refuge will be overseen by the Fish and Wildlife Service (Service) with major programs and visitor services provided by the Midway Phoenix Corporation (MPC) a private cooperator (the Cooperator).

The plan does not concern itself with visitor services such as transportation to the Refuge, food services, or retail sales. This plan will identify the interpretive and recreational programs to be implemented, where activities will take place, which regulations will or may apply, and provide an initial list of products, infrastructure, and staffing required to manage the public use program. Identified programs will provide quality wildlife and history related educational and recreational experiences for all audiences (visitors and employees) on Midway Atoll. These programs have been developed to be compatible with the purposes of the Refuge by assuring adequate protection of native wildlife and associated habitats.

Due to the demands of operating and maintaining a remote island refuge, there will be a staff of approximately 150 on the Refuge at all times. Most of the staff will be employed by the Service's Cooperator. The Cooperator will be required to adhere to all public use guidelines set forth in this plan except where noted. Additional activities and freedoms, above those allowed for the general public, have been allowed for long-term residents to provide a reasonable level of recreational opportunities. These experiences are permitted because of the unique nature of the Refuge's remote location. A persuasive penalty system will be imposed on employees who violate restrictions associated with these opportunities.

For the purpose of this plan, interpretive experiences/services refers to all mediums which provide an educational/informational message to the visiting public or residents. Recreational experiences/services refers to activities that do not deliver a cohesive, planned informational/educational message.

This plan has been developed to be sensitive to the vulnerability of threatened and

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endangered species and migratory birds to human activities. Much consideration has gone into the conceptual design of trails and public use areas to minimize or completely restrict access to sensitive beach areas and unpaved grass/shrub habitat. It also considers the sensitivity of other marine mammals and the depletion of consumable resources. Orientations, pre-visit brochures and flyers, exhibits, signs, interpretive programs, and Refuge law enforcement officers and interpretive staff will combine to minimize the potential for disturbance of Refuge wildlife and habitats.

The Service developed this public use plan using the expertise of Refuge managers, biologists, public use specialists, and other interested parties.

For the purposes of this plan the first year of visitation is defined as a development phase. This plan will develop into a comprehensive and final document upon analysis and observation after the first year of visitation.

### B. Responsibilities

#### 1. Responsibilities of the Cooperator

MPC will cooperate with the Service to provide Refuge logistic and operational support for the public use program. The Cooperator will also operate certain aspects of this public use program. They will provide the general public with transportation to the Refuge as well as lodging, food service, and a number of other visitor services and educational and recreational opportunities. The Cooperator may charge fees for these services to generate the capital necessary to support these Refuge uses. The Cooperator will provide all supplies, equipment, facilities, and staff necessary to implement recreational uses described in this plan. The Cooperator will also provide all supplies, equipment, facilities, products, and funds necessary to implement the interpretive programs described in this plan.

#### 2. Responsibilities of the Service

The Service will insure that all public uses are compatible with refuge purposes and provide overall guidance for the program. The Service will provide staffing necessary to implement the interpretive programs

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described in the plan, oversee all public uses, enforce Refuge regulations, and provide technical assistance for development and implementation of the public use plan. Staffing will be dependent upon contributed funds generated by the Cooperator.

### C. The Visitor Experience

Most visitors will access Midway Atoll NWR through the services of the Cooperator. These visitors will purchase a tour package which will include air travel from Lihue, Kauai airport, room and board and activities of their choice. The Refuge will have ample opportunity to prepare and educate visitors prior to arrival through brochures and flyers the visitor will receive in the Cooperator's marketing and pre-registration orientation material. Orientation continues with a video viewed just prior to flying from Lihue, and upon arrival the Cooperator will generally orient visitors and provide direction to the eating facilities and the visitor services office to check-in to their room. It is mandatory for all visitors to attend a service presented orientation that will provide general information about the Refuge, appropriate behavior around wildlife, and public access area regulations. This orientation will also allow visitors to ask questions of a Refuge employee. Throughout their approximately three to four day visit, visitors can enjoy a variety of Refuge guided interpretive activities, utilize the Service's visitor contact station, view audio visual programs, participate in Cooperator operated interpretive/recreational programs and visit the museum.

Other public will arrive by transient aircraft for the main purpose of refueling the plane. For the purposes of this plan, people arriving by this transportation mode are referred to as transient visitors. Transient visitors will be given the opportunity to enjoy the island for a few days if space is available. It is mandatory for all transient visitors to participate in an orientation program (See Public Access Management, under Access for further details).

### D. Targeted Audience

Most of the audience targeted by the Refuge and Cooperator's marketing efforts will have no strong specific special interest except a desire to experience a remote outdoor oriented location, others will have a special interest in birds and/or history, sportfishing and scuba diving. Transient visitors will consist of about 2% of the total visiting public. Efforts should be made to emphasize the importance

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of offering equitable opportunity for visitors with varied general interests. General audiences have limited exposure to such remote locations and perhaps the Service has the most to gain by educating a public with limited opportunities to "vacation in a bird colony" and learn the importance of atoll habitat to wildlife.

An age limit of 18 is required during the development phase based on negotiations with the Navy associated with liability during environmental cleanup efforts. Once jurisdiction passes to the Service and the development phase is complete, a minimum age will be established based upon a risk assessment of safety hazards and wildlife disturbance issues.

Other audiences will include:

- Participatory Research and Management:

The Cooperator will provide opportunities for organized groups (such as Elderhostel) and groups specifically interested in participating in "hands on" research and management projects. This public will be given strong guidance in the field by trained personnel. Close coordination with Refuge staff will provide opportunities for those who want to participate in research and management of the Refuge. The research and management activities will be issued Special Use Permits by the Refuge. It is anticipated that some of the above described groups may participate in a few of the Refuge guided activities and recreational activities offered by the Cooperator.

- On-site Environmental Education:

Provisions and infrastructure to provide for conservation and educational institutions to bring small groups of students to the Refuge is currently being considered.

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- Off-site Environmental Education:

Several programs are being developed that will reach school age students far beyond the boundaries of Midway. A Pan-Pacific Education and Communication Experiment by Satellite (PEACESAT) terminal will allow the Service or Cooperator to transmit video, sound, and data information products directly into classrooms in Hawaii and throughout the Pacific. A poster depicting the natural history of the Atoll will be developed for dissemination to schools throughout the United States and territories of the South Pacific.

- On-site Employees:

Cooperator and Refuge employees who reside on Midway will participate in educational and recreational activities. Because of Midway's remote location, special provisions for residents to participate in non-wildlife and wildlife dependent recreational activities have been identified in an employee recreation program (See V. Recreation). Some aspects of this program will provide opportunities and access above that provided to the general public.

E. Development Phase

Throughout this plan, reference will be made to a development phase. This phase consists of a one-year period in which the Service and the Cooperator will have the opportunity to observe, monitor, and gauge human-wildlife interactions, analyze and/or project biological impacts, and fine tune the programs described in this plan. It will take effect once the Navy transfers ownership of the Atoll to the Service, scheduled to occur in Spring 1996 and will end in June of 1997 when the Navy departs the atoll. The Service and its cooperator will be phasing in their operations as the U.S. Navy phases out theirs. Due to the activities related to completing environmental cleanup and the limited availability of lodging, the Service has agreed to limit the number of public visitors to thirty until the Navy departs the atoll in June 1997. This development phase will also allow the Cooperator to hone its marketing strategies. Visitors during this phase will be informed prior to arrival that services will be offered at a minimal level. To assist Refuge and Cooperator staff with first year analysis, each visitor will be asked to complete an evaluation upon departure from Midway. This development phase

## Appendix C Public Use Plan

will provide the public and the Refuge with an unusual opportunity to share ideas and allow the public to actively participate in the public use planning for a one-of-a-kind refuge.

The public will have access to areas not planned to be opened after the development phase. This is primarily due to the difficulty in separating 30 tourists from others on the island. Some areas planned to be accessible after the development phase will be closed during the development phase due to restrictions related to environmental cleanup activities.

Analysis from the development phase will be used as guidelines by the Service and the Cooperator in determining future levels of public use activities. Certain activities, such as Eastern Island tours, fishing, and snorkeling, have interim use limits established during the development phase. During the development phase the Service and its Cooperator will formalize a Refuge sport fishing plan and submit all required documents required for formally opening the Refuge to sport fishing once primary jurisdiction is received by the Service through Executive Order. Using the monitoring results and study analysis, the Service may decrease or increase the use limits established during the development phase to insure all uses are compatible with Refuge purposes. Future use limits will be reflected in an annual update of the comprehensive public use management plan. Beyond the first year the number of visitors will increase to a maximum of one hundred per day. During the development phase, the Navy and its contractors will be subject to existing Navy regulations for recreational activities.

### II. Interpretive Themes - Take Home Messages

All the educational and/or interpretive experiences at Midway Atoll carry and portray a message about the Refuge. These messages, or interpretive themes, support and convey the Refuge objectives in a flexible, user-friendly manner. Establishing a set of interpretive themes provides the criteria from which planned visitor experiences are designed, developed, and implemented. Key themes are presented by weaving related topics into a variety of visitor products, facilities, and services. To guide the Refuge and Cooperator in planning the many types of visitor experiences the following themes were developed:



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### A. Fragile Environment

Midway's location exemplifies the importance of its unique and invaluable habitat for seabirds and marine animals. This remote atoll habitat is critical to wildlife survival since most seabirds, monk seals, and turtles must find terrestrial habitat to nest and rear their young. The Atoll's closest land-based neighbor is Kure Atoll 62 miles to the northwest, which is the western most island in the Hawaiian Archipelago. Johnston Atoll lies 800 miles to the south, Wake 1,200 miles to the southwest.

At the southern end of the Archipelago, lie the main Hawaiian islands. The smaller atolls and islands between Midway and the main Hawaiian Islands are also managed by the U.S. Fish and Wildlife Service. Prior to development, the main Hawaiian islands were also home to thousands of birds and diverse marine life. What appears to be healthy populations at Midway does not make up for the loss in numbers upon development of the main islands. This contrast in populations reinforces the concept of habitat protection in order to conserve wildlife -- a key message on any National Wildlife Refuge.

Of particular concern is protecting and facilitating the recovery of the endangered monk seal and the threatened green sea turtle and protecting large seabird nesting colonies. Monk seal populations are currently declining at an alarming rate. Midway Atoll provides invaluable beach for resting and shallow water habitat for feeding to assist in their fight for survival. The monk seals are extremely sensitive to human disturbance. Exposure to humans can prevent the seal from hauling up for needed rest. Green sea turtles dependent on the food sources in the lagoon may attempt to nest on the atoll.

### B. Human Intervention

Throughout the human history of Midway Atoll the habitat and wildlife have coexisted for better or for worse. The effects of egg and feather harvesting in the mid to late 1800's, the conservation efforts of cable company employees and Theodore Roosevelt, introduction of predator species and non-native plants, the onslaught of War World II, Naval activities and all marine debris have impacted the population of seabirds, native vegetation and marine mammals. An increasing environmental awareness and positive coordinated action between participating agencies have witnessed a revival of some wildlife populations.

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Refuge management will address eradicating or controlling alien species that have major adverse impacts on native biodiversity and prevention of additional introduced plants and animals. Eastern Island will provide an example of how an island can rebound to a more natural state by minimal human disturbance, elimination of terrestrial predators, and implementing good recovery programs.

### C. Call to Duty

Because of the unique current partnership, dynamic human interactions, and the existence of numerous historical structures, the story of human history is a focal point of interpretation. Midway is most noted for its role in pivotal events of World War II. To view structures and imagine the battle that was launched from the islands is a unique experience.

Other significant points of history span the arrival of Captain Nick Brooks to the Commercial Pacific Cable Company, from the Pan American World Airways air base operation to the Battle of Midway, from the community life of the Vietnam and Cold war era, and the designation of the Naval Air Facility (NAF), to the development of Midway Atoll National Wildlife Refuge. Human events are naturally intertwined with the natural history story. For example, many of the non-native species were introduced during the early 1900's, causing disappearance of birds on Sand Island. However the arrival of lawns provided habitat for certain nesting seabirds.

### D. Making a Difference

Midway Atoll NWR is an integral part of the Pacific ecosystem. A crucial part of maintaining the health of the ecosystem requires monitoring and managing habitat and wildlife populations. Variance in species and habitat indicate ecosystem change. For instance seabirds depend on predatory fish, such as tuna, to concentrate small fish and squid at the surface where they can easily retrieve them. If predatory fish decline in numbers, it may prove a problem for tropical seabirds. Therefore the Service's presence to perform biological monitoring is crucial to implement appropriate actions and protect species in such a remote location.

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III. Public Access Management

A. Access

Visitors can access Midway in three ways: 1) Cooperator operated airline; 2) Private vessel; 3) Transient aircraft. No matter what mode visitors use to access the Refuge, they will require prior permission to enter and will receive orientation materials prior to entry.

B. Orientation

The following will describe how visitor groups will be oriented according to their transportation mode as listed above:

1. Regularly scheduled Cooperator airline flights

Most visitors will arrive by regularly scheduled Cooperator flights. These visitors will be oriented to public access issues prior to arrival through a brochure in a pre-registration packet, through a rules and regulations flyer in a post-registration packet, and through an audio visual program presented at the Lihue Airport prior to departure for Midway. Within three hours of arrival on Midway, a thirty minute orientation program given by Refuge staff will be presented to all arriving visitors. This series of orientations will provide a general orientation to the Refuge, inform the visitors about all regulations, including specific information on public access issues.

2. Private vessel entry

These visitors are required to pre-register through the same procedures as the above group of visitors. In addition, pre-visit flyers will be utilized to specify the regulations and clearance procedures they must adhere to as outlined in the Operations and Maintenance Plan. Their pre-visit information packet should also specify that they are required to participate in a regularly scheduled orientation program or view a video of the actual orientation program within three hours of their arrival time.

3. Transient visitors

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All transient visitors will receive a pre-arrival briefing packet, and are required to participate in a regularly scheduled orientation program or view a video of the actual orientation program within three hours of their arrival time. Their pre-arrival briefing packet will include public access maps, rules and regulations including but not limited to alien species introduction prevention criteria and proper behavior around wildlife, and orientation requirements.

### C. Public Use Areas

#### 1. Sand Island

Thousands of seabirds, such as shearwaters and petrels, nest in holes (burrows) dug in the ground. These holes are hidden in areas that look like safe sandy areas to explore and thus, can be easily crushed by a human. Thousands of Laysan albatross nest nine months out of the year on manicured lawns and natural habitat areas. During the development phase, the public will have access to areas noted in Figure 1. After the development phase public access will be more restrictive (See Figure 2). Requirements for new trails will incorporate techniques sensitive to species and habitats. Due to safety reasons or wildlife and habitat sensitivities, certain paved trails will be closed to visitors unless accompanied by a trained guide. Residents will be allowed access to certain trails which will be closed to the unguided public after the development phase (See figure 1 and 2).

#### 2. Eastern Island

Eastern Island will only be accessible to the public through guided tours or through special use permits provided for participatory research and management programs. Residents will only be allowed access to the island for Refuge approved management activities.

#### 3. Spit Island

To protect this sensitive habitat, Spit Island is strictly off limits to all public use.

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D. Signs

A sign plan will be developed by Service staff to coordinate a cohesive look. Signs will clearly mark areas closed to the public because of safety concerns or wildlife impacts, regulations or policy, and buildings and areas for public use. Signs currently in use span from the mid-1940's to the recent NAF operation. Efforts will be made to maintain historical integrity and allow older decorative signs relative to Midway's history to be utilized. In the future these identified "historical" signs may warrant restoration or identical replacement.

IV. Interpretation and Education

Interpretive experiences are educational/informational services offered to the visitors. Visitors will discover Midway's unique cultural and natural heritage through various sources of media, such as brochures, guided and self-guided field programs, exhibits, audio-visual productions, visitor contact station, orientation video, etc. The following section will address long term goals and allows flexibility for reduction in frequency of programs during the development phase and expansion of services as the Service and its Cooperator progress in development of the public use program.

A. Interpretive Programs

Interpretive theme related programs will be developed by a Refuge Outdoor Recreation Planner and implemented by Service employees or volunteers or through Service approved guides. Typical guided programs offered include:

1. Sand Island

a. Guided Walks and Bicycle Tours

One walking and two bicycle tours will be offered approximately twice a day. Natural history and cultural history themes will be utilized to implement creative presentations. A maximum of one natural and one cultural history 1.5 hour bicycle tour will be offered per day. A two hour bicycle tour will include a mixture of cultural and natural history. The above trip routes will vary according to the physical ability of the audience, weather, and

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wildlife use patterns. Pending weather conditions, the two hour bicycle tour will take place on the southwest loop trail which is inaccessible by the general public, unless involved in a guided trip (See figure 1 and 2).

b. Self-guided Tours

With the assistance of a brochure, a self-guided 1.5 hour walk will highlight the human history of Midway, in particular, the WWII history.

c. Talks

Talks consist of interpretive presentations of 15 minutes to 1.5 hours. Fifteen minute "mini talks" can be offered anytime of the day at certain pre-scheduled locations from topics ranging from a petrel banding demonstration to a presentation about monk seals. A minimum of two "mini talks" will be offered weekly. Longer presentations will be scheduled in the evening. Day presentations will be offered upon special request and pending staff availability. Evening programs will cover a wide range of topics and will be delivered in a slide show format, as a film, or as a guest speaker presentation.

2. Eastern Island

Eastern Island will give visitors a chance to experience a recovering dynamic resource. Because of the Refuge's rat eradication program and minimal development and human disturbance, Eastern Island gives visitors an opportunity to experience a more diverse ecosystem. All trips will be guided by the Service or persons approved by the Service and include a twenty minute boat ride each way. Rudimentary lavatories will be installed near the primary landing site.

To ensure a safe trip for visitors and to protect and minimize disturbance to monk seals and seabirds, Eastern Island tours for the general public will consist of two types of trips scheduled at separate times of the year. Both tours will be offered a maximum of four times per week during the

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development phase to groups of no more than fifteen. The Refuge manager may increase or decrease the number of visitors or the number of general or special interest trips after monitoring biological effects during the development phase. The allowable number of visitors and trips will be reflected in updated public use plans.

Boats will carry the public to a primary shoreline landing site near the north end of the runway (See figure 3). If seals or turtles are present in this landing area an alternate landing site (See Figure 3) will be utilized and the tour route will fluctuate accordingly. Beach walking will not be allowed to prevent possible disturbance to seals and turtles.

a. Walking Tour

“Walking tours” will be available from the middle of September through the beginning of March. Each tour will consist of walking near several significant seabird nesting sites and cultural history sites. Due to the heat and lack of any shaded areas this trip is designed for the person who is specifically interested in viewing several species of seabirds not commonly seen on Sand Island and/or visiting the site of the original Midway Airfield where U.S. aircraft were launched to participate in the air and sea Battle for Midway.

b. Viewing Trip

"Viewing trips" will be available during the rest of the year and will consist of viewing historical sites and seabirds from an elevated platform with several levels for maximum viewing potential. The viewing platform will provide shade, and comfortably hold 17 people and will be built near the primary landing site. The viewing trip will lessen the impact to seasonally nesting seabirds on the abandoned runways.

c. Special Tours

Pre-registration and a special use permit is required for small organized special interest groups. Groups of no more than five can

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tour Eastern Island as a land based walking tour during the heavy seabird nesting season of March through the middle of September. These groups must be led by a Service approved guide and can not exceed the total allowable number of four trips per week during the development phase.

### B. Education Assistance

The Refuge will provide both on and off site assistance to educational institutions desiring more focused educational programs than those provided through Refuge interpretive programming. Educational institutions or other groups that arrange a visit to Midway through the Cooperator may request assistance from the Refuge in preparing an educational program. The Refuge may provide indoor and outdoor classrooms for special study, presentation of specially prepared programs on Refuge resources, and opportunities to assist with Refuge research and management.

Other programs will be developed which reach students beyond the boundaries of Midway Atoll NWR. There is a Service initiative to increase the number of youth educated about the Service's management objectives. To "reach out" to our future generations, satellite links from Midway will allow communication with hundreds of students in Hawaii with expansion possibilities to include the mainland U. S. and the territories of the South Pacific. A satellite terminal will transmit video, sound, and data information products directly into the classroom. Satellite transmission is currently being utilized in the State of Hawaii to communicate and send programs from base stations into the classroom. The Hawaii Board of Education has agreed to offer free air time on existing science educational programs being aired weekly to 75% of the schools in the State of Hawaii. Other "outreach" products include production of a poster for sale on Midway and dissemination to the schools in the State of Hawaii. The poster would depict the Atoll environment and biological significance.

### C. Interpretation and Education Support Requirements

A variety of publications, exhibits, and other infrastructure will be required to implement and support the Refuge interpretation and education program.



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1. Refuge Brochure

A full color Refuge brochure will be developed that describes the atoll's unique cultural and natural attributes, the Refuge management objectives, and basic information about how to visit the Refuge. The Refuge brochure will reflect a similar format as other refuge brochures from within the Hawaiian and Pacific Islands NWR Complex. This brochure will be of a quality that would make it possibly a sellable item on the Refuge through a cooperating association or through the Cooperator gift shop. The Cooperator will assist with printing cost to offset the number of brochures they distribute.

2. Family of Additional Brochures

A "family" of full color glossy brochures will be designed and developed by an interpretive design firm. Production would be included under a separate contract. Brochure topics include but are not limited to:

Midway Underwater (A snorkeler's guide)

The Battle of Midway

A Natural History, "Story Behind the Scenery"

Birds of the Sea

A Walk Through Time (Self-guided History Brochure)

Means There is Still Time

Who is Stopping By? (A guide to the migrating shorebirds)

Giving the Natives a Chance (History and management of native plants)

The development of the family of brochures is particularly important to effectively interpret the natural history of the birds, such as interpreting the identification and behavior of thousands of seabirds. For example, a brochure will graphically depict an atoll scene focusing on a specific habitat to illustrate where in this particular habitat you might find a certain species. The exposure to thousand of birds will spark the visitor's curiosity to want to learn more.

3. Flyers

Detailed information in the form of one page flyers will be utilized to

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orient the visitor with a detailed map indicating public use zones; to disseminate an activity schedule; to inform visitors on how to behave around wildlife; to explain to the public the "Unique Partnership for Preservation"(an overview of who provides what services and what each group does on the island to preserve the habitat); to provide a cross word puzzle and fill in the blank activities for constructive use of in-flight time. These flyers will be designed and printed by the Cooperator. Content information will be the responsibility of the Refuge.

### 4. Exhibits

Approximately five outdoor cultural history exhibits will be designed by an interpretive design firm. These exhibits will depict through graphics and text the human history of Midway. Exhibit supports will be designed to minimize bird collisions and will be mounted on existing structures whenever possible.

### 5. Midway Film

A professionally produced film will tell the story of Midway Atoll National Wildlife Refuge and the nature of its unique partnership with the private sector. This film should be approximately 20 to 30 minutes in length and should be aired at the theater shortly after arrival or viewed as an orientation video at the Lihue Airport. This film can be sold in video format to visitors and will be distributed through the Service or Cooperator as an educational tool for teachers, or general information to the media and to other interested parties.

### 6. Visitor Contact Facility

A contact station managed by Refuge staff and volunteers may be needed to enable visitors to retrieve Refuge information at a central location. This should be located near the Cooperator's visitor services desk. Activity schedules, updates on possible program or trip changes or cancellations, a book/video loan library, and a person to talk to for information on the cultural or natural history would be accessible on a schedule to be determined at the designated contact station.

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7. Museum

A museum will be developed by the Cooperator that should relate to the Refuge's interpretive themes, addressing cultural as well as the natural history of Midway Atoll. A cable company building is being considered for use as a museum. If the cable company building is not restored the Gooney theater may be used for the dual purposes as a museum and theater. The Cooperator will produce a Service approved plan for implementation and development of a museum.

8. Gooney Theater

The existing theater is in good condition and is an excellent facility to deliver presentations to any public group. It could also serve as a staging site for group gatherings. To rehabilitate the facility will require upgrading the sound system and audiovisual projection room. The theater should be wired to allow a presenter to turn projectors off and on near the stage. At least 125 seats will need to be refurbished. The theater may double as a museum.

9. Historical Properties

Bunker #S6194 will be kept open and safe for the visiting public to be able to go inside.

10. Viewing Platforms

In addition to the platform mentioned on Eastern Island, one should be built northeast of Frigate Point and one at Rusty Bucket (See Figure 2). These platforms will be built on the inland side of the dunes no more than four foot off the ground level. Elevated viewpoints will give visitors a chance to view the beach and look for marine mammals without posing a disturbance to a beached monk seal. To protect marine mammals that might be on the beach, visitors will not be allowed to wander off the platform to walk down the beach.

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11. Trails

A trail will need to be cleared and maintained in the ironwood forest from Frigate Point to the abandoned runway to provide access for the public to viewing platforms and historic properties.

V. Recreation Program

A. Employee Recreation

An employee recreation program will be implemented to meet the needs of a resident population who are located in very remote circumstances among a community of approximately 150. Some of the listed recreational opportunities will also be available to visitors. The following activities will be managed by the Cooperator.

Tennis, bowling, shuffle board and other fitness activities will be allowed to occur within the existing infrastructure currently being managed and utilized by residents. Visitors and employees will be allowed to use on a first come first serve basis.

Residents will be required to follow the same regulations for beach use as visitors during the development phase.

Residents will be allowed to utilize the southwest loop trail on an unguided basis during and after the development phase (See Figure 1 and 2) for walking, jogging purposes, and bicycling.

The Cooperator may provide rental boats for use by Refuge residents for fishing, diving, and snorkeling. Residents must abide by all Refuge regulations related to these activities and can only use boats for transportation to participate in such activities.

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B. Wildlife Dependent Recreation

1. Sportfishing

Midway's sport fishing program will occur as permitted by the Navy prior to transfer of jurisdiction to the Service and as permitted by Refuge regulations after transfer of jurisdiction. During the development phase fishing will be guided by interim regulations. During the development phase the Service and its Cooperator will formalize a Refuge sport fishing plan and submit all documents required for formally opening the Refuge to sport fishing once primary jurisdiction is received by the Service through Executive Order.

Cooperator fishing boats will depart from Midway's Inner Harbor. Registration for and scheduling of sportfishing trips must be arranged through the Cooperator. By the end of the development phase, a fishing plan must be prepared and approved according to Refuge policy and regulations. During the development phase, fishing will be subject to at least the following interim regulations:

- Within the lagoon, only light, spin, tackle fishing and fly fishing will be allowed from a non-anchored boat on a catch and release basis. Artificial bait and barbless hooks must be utilized to protect monk seals from injury and possible attraction to live bait. Catch and release fishing pressure within the lagoon may be reduced by the Refuge Manager at any time the Service believes such a reduction is necessary. Certain areas are prohibited to any boat traffic (buffer zones, See figure 4).
- Outside the lagoon, but within the Refuge boundary, target species for sport fishing will be limited to pelagic species on primarily a catch and release basis. A limit of one fish per person may be kept for consumption on island. Boat captains will be expected to release all fish that can be released alive. Fish that die as a result of being caught should be the primary source for each person's limit. Additional fish that die as a result of being caught will be returned to the ocean. No other marine species may be targeted.

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- The following are prohibited: shore based fishing, spear fishing, and net fishing.
- Consumption of fish species prone to ciguatera poisoning is prohibited due to the potential for illness.
- Fish cannot be shipped off the Refuge with the exception of record billfish for mounting purposes.
- Boat captains must keep a log of all fish hooked per trip for submission to the Refuge manager.
- Other federal regulations as specified by the National Marine Fisheries Service may apply outside the Refuge boundary.

2. Scuba Diving/Snorkeling

Guided diving and snorkeling trips will be offered by the Cooperator. All visitors and employees who elect to go diving will be oriented by the dive master about marine resource sensitivities and regulations. Public divers will be accompanied by a certified dive master or other certified personnel who will emphasize safety concerns, assist visitors in learning how to snorkel and scuba dive and interpret the reef environment and marine resource sensitivities. Equipment and services will be made available through the dive shop.

During the development phase, the tiger shark population will be monitored. An increase in population at certain times of the year may lead to restricting the scuba diving/snorkeling program to certain days, hours, or season.

The following general regulations apply to this program in addition to standard safety procedures to be developed:

- Recreational diving and snorkeling will always occur off of boats, except for students who may be taught at the swimming beach.
- Diving/snorkeling is permitted within and outside the atoll lagoon,

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except within the buffer zone as indicated in figure 4.

- Dive boats must use sand anchors only and the operator must develop dive equipment standards and depth limits.
- No fishing or collecting of dead or alive marine life by divers and snorkelers is allowed.
- The Cooperator will develop a dive site chart and rotational schedule to minimize impacts of the activity on habitat and species. The chart and schedule will be approved by the Service and revised as necessary for the protection of Refuge resources. This schedule will also apply to Refuge residents.

### 3. Boating

Boating will only be allowed for transportation to and from approved wildlife dependent recreational activities. The following regulations apply:

- Designated boat operators must have taken a current United States Coast Guard (USCG) approved operator safety course and must have attended Refuge orientation for boating regarding anchoring, restricted areas, and wildlife sensitivities.
- Recreational boating for reasons other than the above approved activities will not be allowed.
- All boat operators will be required to file a float plan and maintain records of endangered species interactions.

### C. Non-wildlife Dependent Recreation

The following recreational activities will be managed by the Cooperator. Non-wildlife dependent activities are listed in this plan to provide adequate recreational services and modes of transportation for the resident population and visitors. Close monitoring of activities by Refuge staff will occur to minimize impacts to resources and to set recreational use limits during the development phase.

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### 1. Beach Use (i.e. beach walking, swimming, sunbathing, beach picnicking, volleyball)

During the development phase, all beaches on Sand Island are open to the public except the south beach from Frigate Point to the runway seawall (See figure 1). Visitors will be required to maintain a 100 foot off-limits perimeter around any monk seals encountered. Signs posted by beach access points will reiterate the 100-foot perimeter rule. This use is being allowed to residents and visitors during the development phase because the Navy and its contractors will continue to have access making it difficult to separate residents from visitors.

To encourage beach use by the endangered Hawaiian monk seal and threatened green sea turtles, most beaches on Sand Island will be closed to the public and employees by the end of the development phase. A limited area will remain open on the north beach, from the west end of the fuel farm seawall to Rusty Bucket point (See figure 2). Swimming, sunbathing, picnicking and volleyball will only be allowed in a designated area close to the main guest lodging area, the beach pavilion, and the restaurant. Buoys may be placed in the water to designate the swimming area. Swimming will only be allowed during daylight hours. Nighttime activities requiring lights will be restricted. Beach walking only will be allowed for the remainder of open beach to Rusty Bucket Point. The Cooperator will provide equipment for beach use.

### 2. Bicycling

Bicycling will be the primary mode of transportation for visitors and staff on the Refuge. All cyclists are to remain on paved surfaces. Bicyclists must also obey all area closed or access restricted signs as posted. Cycling guidelines will be a part of the visitor and staff orientation program upon arrival to Midway Atoll. Bikes will be available to rent from the Cooperator. Biking will be allowed for residents and employees on the southwest loop trail on an unguided basis as indicated in figure 1. This use is being allowed for visitors during the development phase because the Navy and its contractors will continue to have access, making it difficult to separate residents from visitors. The southwest loop trail, after the development phase as indicated in figure 2, will be restricted to residential



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and guided visitor use only.

3. Walking/Jogging

Most paved roads on Sand Island will be accessible to walkers and joggers. Several jogging trails have been defined for visitor use. As with the cyclists, walkers and joggers must obey all area closed or access restricted signs as posted and remain on pavement. During the development phase residents and employees can access the southwest loop trail as indicated in figure 1. This use is being allowed to residents and visitors during the development phase because the Navy and its contractors will continue to have access making it difficult to separate residents from visitors. After the development phase, only residents are allowed to utilize the southwest loop trail as indicated in figure 2 for recreational purposes, unless on a scheduled guided tour.

VI. Staffing Functions and Requirements

A. Recommended Refuge Staffing Levels

The Service anticipates that the following level of Refuge staffing will be required to fulfill their responsibilities for this public use plan. These staff will be primarily involved in management of the public use program. Other Refuge staff may be necessary to provide support such as additional law enforcement.

1. A Recreation Planner will be necessary to perform the following duties:

Plans, implements, supervises and evaluates the Refuge public visitation program in the areas of interpretation, recreation and environmental education.

- Works in close concert with the Cooperator and any subcontractor to ensure effective coordination of the management of public visitation program particularly in the areas of minimizing recreational impacts, scheduling of activities, and evaluating and implementing changes to improve visitor satisfaction and level of knowledge obtained.

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- Directs preparation and development of flyers, exhibits and Refuge brochure updates.
  - Supervises the implementation of those programs and the development of materials and activities for use in the Refuge Environmental Education programs.
  - Plans and develops a visitor contact station
  - Supervises, hires and evaluates all public visitation volunteers
  - Supervises development and presentation of interpretive and educational programs.
  - Prepares and review reports, new releases and correspondence. Works with media representative to disseminate Refuge information.
  - Monitors compliance with concession contract in the areas of visitor programming, recreational services and quality of visitor management, reports problems immediately to designated concessionaire monitor.
  - Occasionally presents visitor orientation program as needed.
  - Law enforcement.
2. An Interpreter will perform the following duties:
- Evaluates and assists in training all public visitation volunteers.
  - Advertises for and supervises student interns.
  - Develops and presents a variety of interpretive programs as a model example to volunteers.
  - Develops and maintains cultural and natural history reference and resource files, library and slide file to develop quality programs

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and for employee development.

- Assists with planning and implementing changes to improve the public visitation program.

3. Volunteers

The proposed interpretive programs will not be possible without the assistance of dedicated volunteers. Volunteers will be trained and supervised by Refuge staff to develop and present interpretive programs, to monitor restricted public access areas, to staff the visitor contact facility, and to provide orientation to incoming visitors. It is estimated that two full-time volunteer positions will be required throughout the year. Volunteers will be expected to commit from three to six months. A two week overlap of volunteers will be required to provide a chance for observation and an extensive two week training course. Much of the Refuge Outdoor Recreation Planner duties will consist of maintaining quality programming through the supervision of lower graded staff and volunteers.

The Service recommends use of Student Conservation Association (SCA) volunteers. SCA is a well established organization which specializes in placing students with federal resource management agencies for approximately a three to six month period so the person can gain experience while working with the agency in the field of their choice. The SCA employee can work 40 hours per week and is given the same training, opportunities, and work load as other entry level paid employees. In return, the student gains valuable experience for future employment possibilities. SCA volunteers will require transportation from Kauai, approximately \$2,000 per student for SCA administrative fees, room and board, and the use of a bicycle.

B. Recommended Cooperator Staffing Level


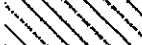







Because of the complexity of the cooperative public use program on the Refuge, it is recommended that the Cooperator have a staff person dedicated to working directly with the Refuge Outdoor Recreation Planner. Many duties concerning visitation management will require working in close coordination. These Co-

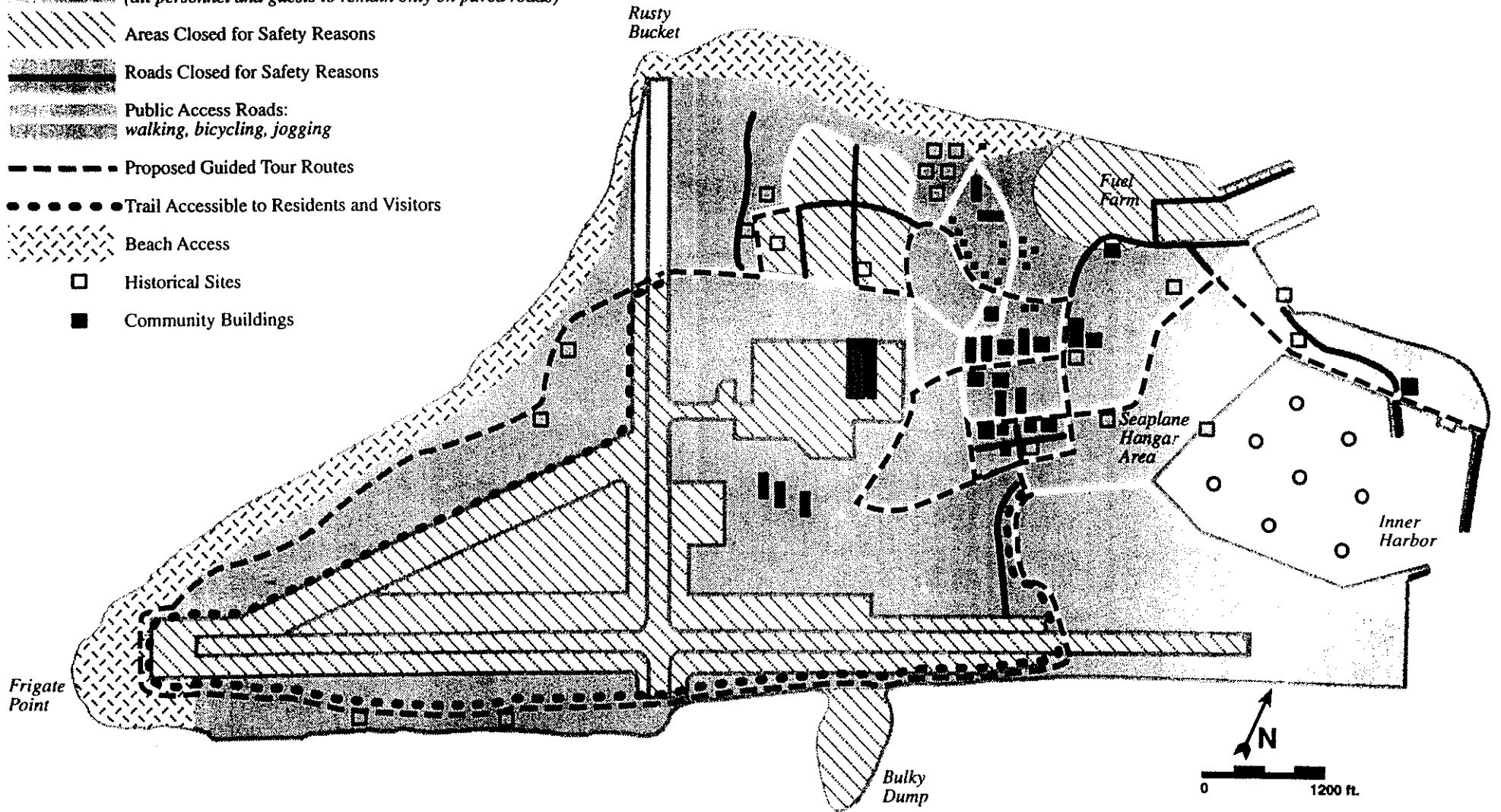
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management duties include but are not limited to:

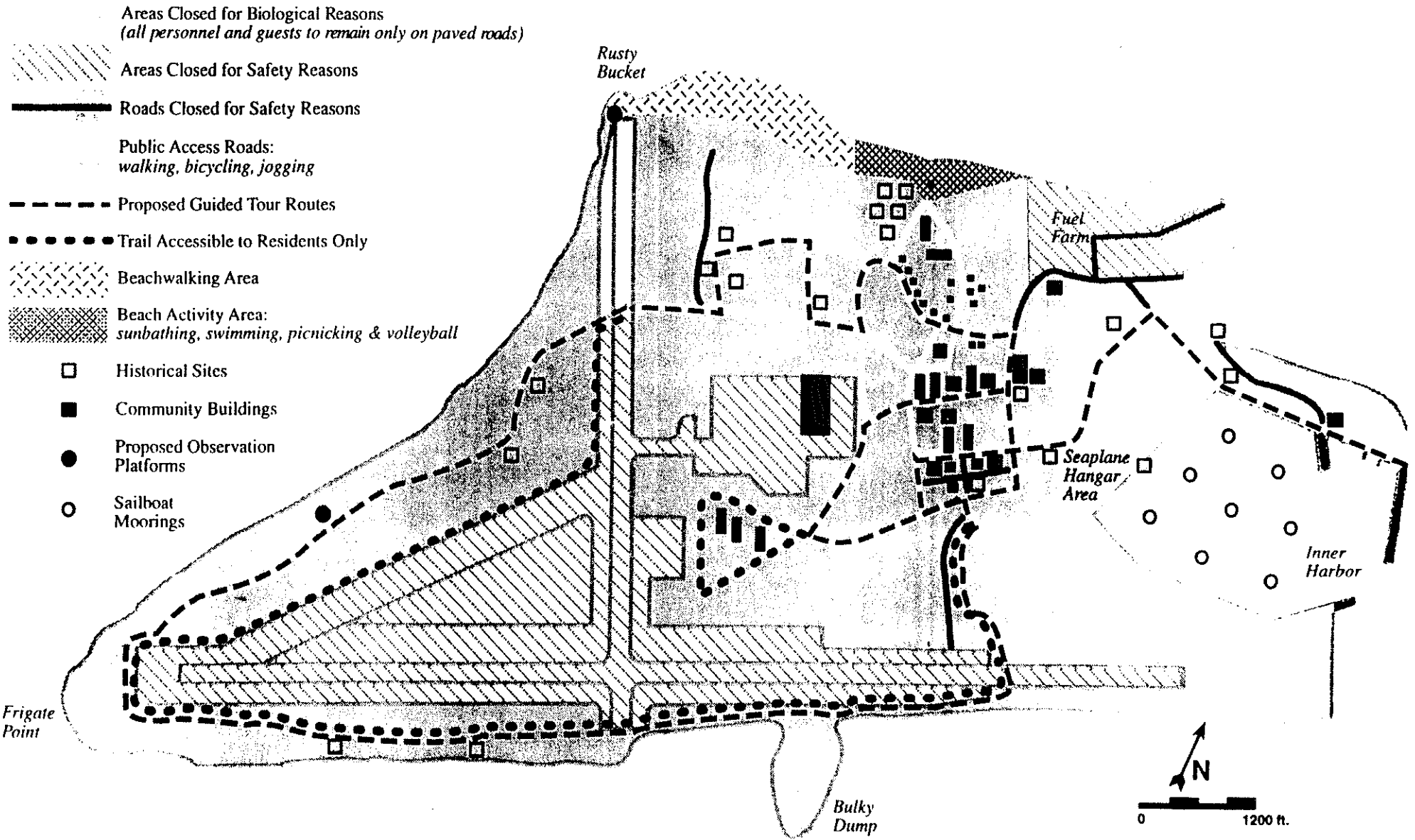
- Co-writing and approval of text for brochures, exhibits, and flyers
- Coordinating activity schedules
- Revising the public use plan
- Addressing visitor complaints
- Orienting, guiding, and welcoming visitors upon arrival

**Figure 1. Development Phase - Sand Island Activity Areas**

-  Areas Closed for Biological Reasons  
(all personnel and guests to remain only on paved roads)
-  Areas Closed for Safety Reasons
-  Roads Closed for Safety Reasons
-  Public Access Roads:  
walking, bicycling, jogging
-  Proposed Guided Tour Routes
-  Trail Accessible to Residents and Visitors
-  Beach Access
-  Historical Sites
-  Community Buildings



Post Development Phase  
**Figure 2. Sand Island Activity Areas**



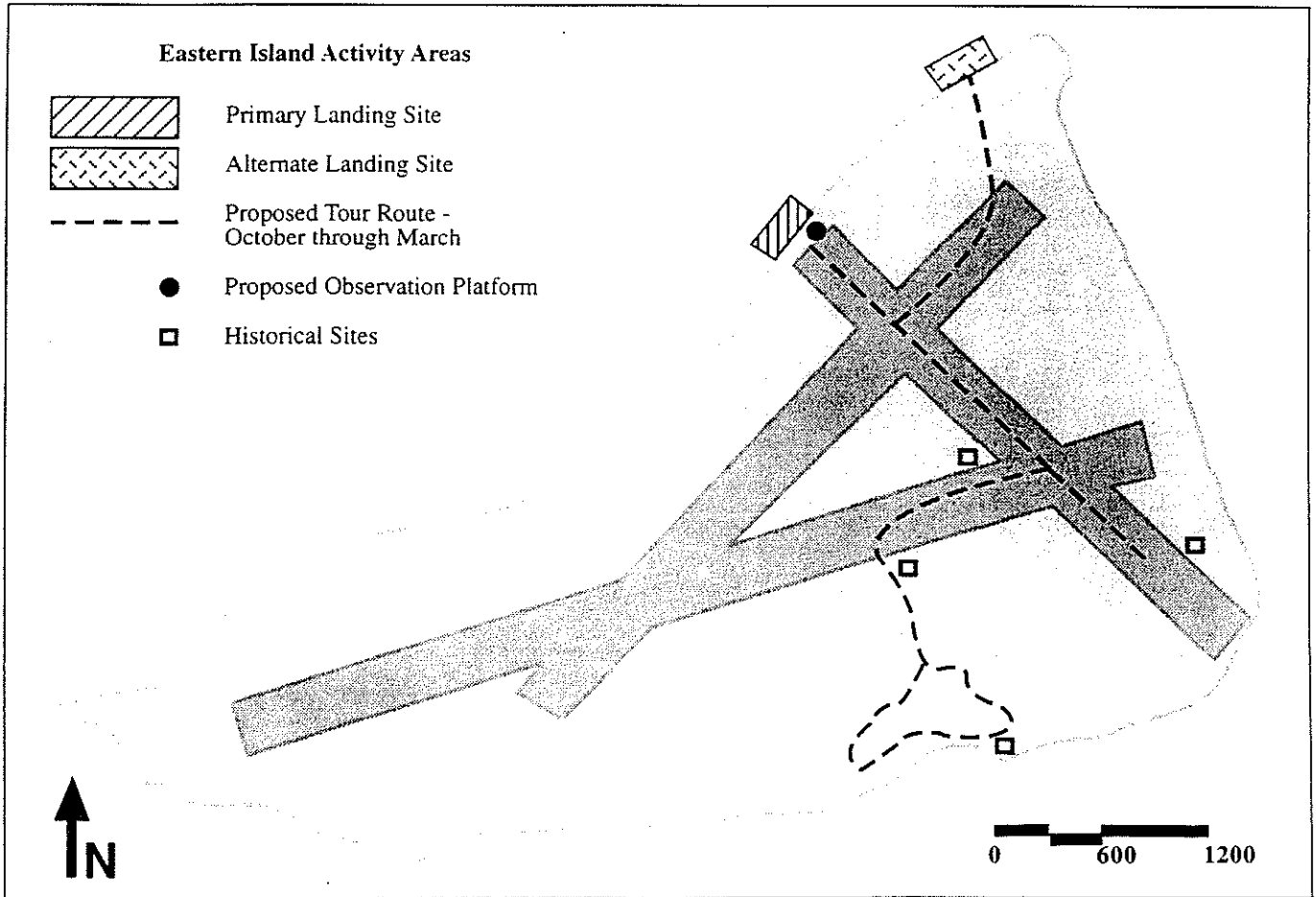


Figure 3

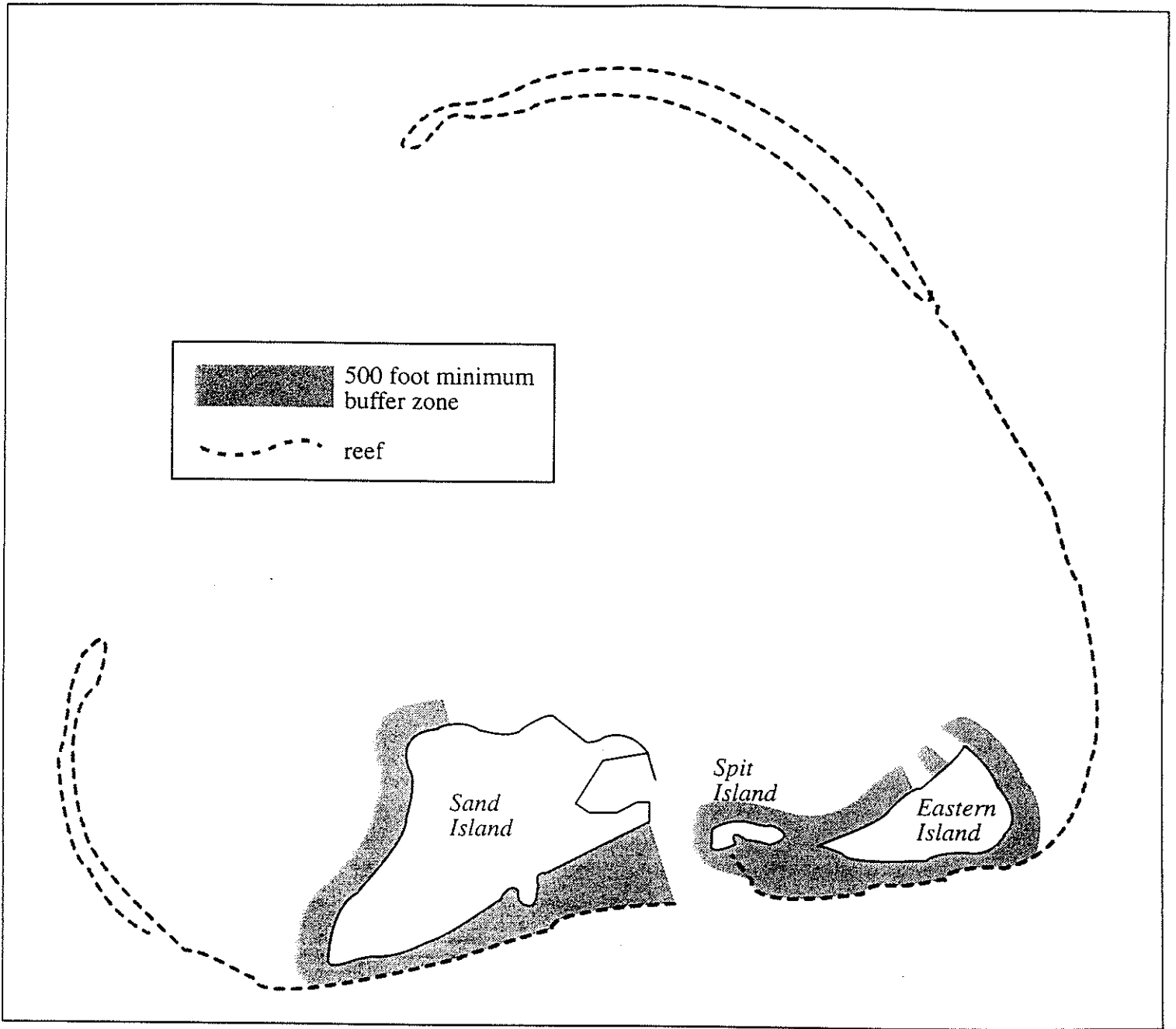


Figure 4. Buffer zones around islands and surrounding reef areas, which are restricted to all public and employee recreation activities.



### *Acknowledgements*

This proposal benefitted from the work of countless individuals and agency representatives who cannot all be named here. On behalf of the U.S. Fish and Wildlife Service, we would like to express our gratitude to the U.S. Department of the Navy who worked closely with us for many years and supported the programs of the Midway Atoll National Wildlife Refuge. The U.S. Coast Guard also supports the natural resources programs of the U.S. Fish and Wildlife Service at Midway Atoll, and at other remote island refuges in the Pacific. We also appreciate assistance from the Department of Commerce, National Marine Fisheries Service; the Western Pacific Regional Fishery Management Council; and the Marine Mammal Commission, and other reviewers for providing input on the proposal. We acknowledge the professional support of our administrative staff in the Honolulu Office. Finally, we appreciate the input provided by contractors who have helped in the planning of the proposed project including Midway Phoenix Corporation and Piquiniq Management Corporation.

*Cover photo: Sand Island, Midway Islands (USFWS file photograph)*