

Papahānaumokuākea Marine National Monument



REQUIREMENTS DOCUMENT

This Document was Funded by the National Marine Sanctuary Program, NOAA

Ferraro Choi & Associates with
TranSystems

October 2007



FACILITY
PROGRAMMING
AND CONSULTING

Sign-Offs and Acknowledgments 1

Background and Executive Summary 2

Activities within the Monument 3

Potential Synergies and Partnerships 4

Business Model 5

Summary of Need 6

Requirements by Location 7

 Kure Atoll 7.1

 Midway Atoll 7.3

 Pearl and Hermes Atoll 7.9

 Lisianski Island 7.10

 Laysan Island 7.11

 French Frigate Shoals 7.12

 Nihoa Island 7.14

 Honolulu 7.15

 Hilo 7.16

Appendix 8

This document is formatted to be printed double sided.

Sign-Offs and Acknowledgments

1

**Papahānaumokuākea Marine National Monument
Requirements Document**

This document was funded by the National Marine Sanctuary Program, NOAA

Recommended for Approval:

Ted Lillestolen

Date

Deputy Director

National Marine Sanctuary Program

NOAA

Dan Strandy

Date

Director, Project Planning and Management, Western Region, OCAO

NOAA

Sean Corson

Date

Deputy Superintendent, PMNM

NOAA

Acknowledgments

A significant commitment was made by the following participants. Their participation is appreciated.

NOAA

Sanctuaries

Ted Lillestolen, Deputy Director

Sanctuaries-PMNM

Sean Corson, Deputy Superintendent
Joe Chojnacki, Field Operations Specialist
Randy Kosaki, Research Program Coordinator
Andy Collins, Education Program Coordinator

Sanctuaries-Pacific Islands Region

Dave Rathbun, Operations Coordinator

Fisheries-PIRO

Mike Tosatto, Deputy Director
Margaret Akamine, Program Analyst

Fisheries-PIFSC CRED

Seema Balwani, Management and Program Analyst

Fisheries-PIFSC PSD

Charles Littnan, Team Leader
Jason Baker, Former Team Leader
Chad Yoshinaga, Program Management Specialist

OCAO-Western Region

Dan Strandy, Director, Project Planning and Management
Tino Escalona, P.E., Project Manager

NOAA Sanctuaries Channel Islands

Todd Jacobs, Assistant Superintendent

FWS

Pacific Region

Chuck Houghten, Chief, Planning and Visitor Services

Mike Marxen, Branch Chief, Visitor Services and Communications

Anan Raymond, Regional Archaeologist

Hawaiian and Pacific Islands NWR Complex

Barry Stieglitz, Project Leader

Barbara Maxfield, Chief, Pacific Islands External Affairs and Visitor Services

PMNM

Susan White, Superintendent

Midway Atoll NWR

Barry Christenson, Refuge Manager

Pacific Remote Islands NWR Complex

Don Palawski, Refuge Manager

Dominique Horvath, Refuge Operations Specialist

Lee Ann Woodward, Resource Contaminants Specialist

State of Hawaii

DOFAW

Paul Conry, Administrator

Cynthia Vanderlip, Manager, Kure Atoll Wildlife Sanctuary

Dave Smith, Manager, Oahu Wildlife Management Section

DAR

Athline Clark, Manager, Special Projects Programs
Kerry Irish, NWHI Policy Specialist

Consultants

For the Requirements Document:

Ferraro Choi and Associates

Christopher Walling

Facility Programming and Consulting

Doug Lowe

TranSystems

David Campbell

Consultants to FSW:

Jones & Jones

Rene Senos
Keith Larson

Photographs are used with permission from NOAA.

Diacriticals for common names have been omitted.

Background and Executive Summary

2



Background

The Papahānaumokuākea Marine National Monument consists of 139,793 square miles of federal lands and waters in and around the Northwestern Hawaiian Islands, and also includes two National Wildlife Refuges, the Midway Atoll National Wildlife Refuge and the Hawaiian Islands National Wildlife Refuge which extends from Nihoa Island to Pearl and Hermes Atoll.

The Monument also includes the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve and the State Marine Refuge.

The Monument has facilities or camps at the following locations:

Kure Atoll
Midway Atoll
Pearl and Hermes Atoll
Lisianski Island
Laysan Island
French Frigate Shoals
Nihoa Island
Honolulu, Oahu
Hilo, Hawaii

The Monument provides an ideal setting for different agencies to work together doing related tasks at more than eight different locations. The Monument is home to a wide variety of marine wildlife, including several threatened and endangered species. The Monument is a desirable research venue for university and private investigators because of the unique value of this particular ecosystem and because it contributes to the geographic network of oceanographic and ecological work being done globally. It also captures the imagination of the general public, and they want to see it firsthand.

Purpose

This report is a visioning document that was funded by the National Marine Sanctuary Program, NOAA. It is intended to inform the Monument Management Plan (MMP) and a more detailed Site and Operational Plan, by providing a general outline of people, programs, assets, and operations. The guiding principles of this report are:

- To outline general field requirements within the Monument
- To quantify current and projected numbers of personnel
- To identify the functional relationships between stakeholders



- To identify potential synergies and partnerships between stakeholders
- To uncover planning opportunities and constraints
- To set the stage for future planning efforts

The report's overarching purpose is to identify at a very basic level, the future facility requirements within the Monument, projected through the year 2022. It summarizes the type and numbers of personnel along with the types of supporting facilities required at each location within the Monument. Those requirements have then been combined to define a "Monument level" requirement at each location.

Other Key Criteria Are:

- The planning horizon is the next 15 years
- Everything is kept at a "high altitude"
- The focus of the report is on Midway
- Sustainable design and renewable resource use will inform the planning process at all levels

The Co-Trustees

The Monument is managed by three Co-Trustees:

- The Department of Commerce's National Oceanic and Atmospheric Administration (NOAA)

- The Department of the Interior's U.S. Fish and Wildlife Service (FWS)
- The State of Hawaii

Stakeholders

Each of the Co-Trustees has several subordinate agencies. Each office is charged with performing separate missions within the Monument. Because these agencies are organizationally distinct from one another, they tend to operate independently, although in many cases, they perform complimentary functions.

NOAA

- Sanctuaries
 - Papahānaumokuākea Marine National Monument (PMNM)
- Fisheries
 - Pacific Islands Fisheries Science Center (PIFSC)
 1. Protected Species Division (PSD)
 2. Coral Reef Ecosystem Division (CRED)
 - Pacific Islands Regional Office (PIRO)

FWS

- National Wildlife Refuges
 - Midway Atoll National Wildlife Refuge

- Hawaiian Islands National Wildlife Refuge

State of Hawaii



- Department of Land & Natural Resources (DLNR)
 - Division of Aquatic Resources (DAR)
 - Division of Forestry and Wildlife (DOFAW)
- Office of Hawaiian Affairs (OHA)

Process and Deliverables

This report will help ensure that NOAA's requirements are clearly identified so that FWS can accommodate them when they prepare a future master plan for the Monument. This report is not intended to be a detailed program of requirements. That effort will take place during the master planning process.

Developing this report included the following milestones:

- Completed Kickoff Conference Call with Stakeholders
- Issued Fact-finding Questionnaire
- Conducted 1½ Day Workshop in Honolulu, June 27 & 28, 2007
- Issued Workshop Findings Spreadsheet
- Issued Preliminary Draft, July 17, 2007
- Issued Second Draft, July 24, 2007

- Issued Pre-final Report, September 2007
- Issued Final Report, October 2007

Status Quo and Projected Growth

Current facilities within the Monument are a combination of aging buildings and support facilities, primarily at Midway. Although there are a few permanent buildings at Kure and French Frigate Shoals, they are in marginal condition. Existing infrastructure is in need of repair, replacement, or removal. Field camps on the remaining islands are housed in tents.

NOAA, FWS, and the State of Hawaii are all projecting growth in personnel stationed within the Monument. In addition, although all of NOAA's Marine Sanctuary Program activities are currently ship-based, it plans to establish a physical presence on Midway. Together, personnel from all agencies operating within the Monument are projected to increase from 210 to 350, a 67% increase in peak population over the next 15 years, not including visiting groups. These numbers are estimates and there is uncertainty in projecting across multiple agencies at so many locations. However, these estimates are a valid starting point for planning for the facilities, transportation, and infrastructure requirements within the Monument. The stakeholders should periodically review and update these projected requirements.

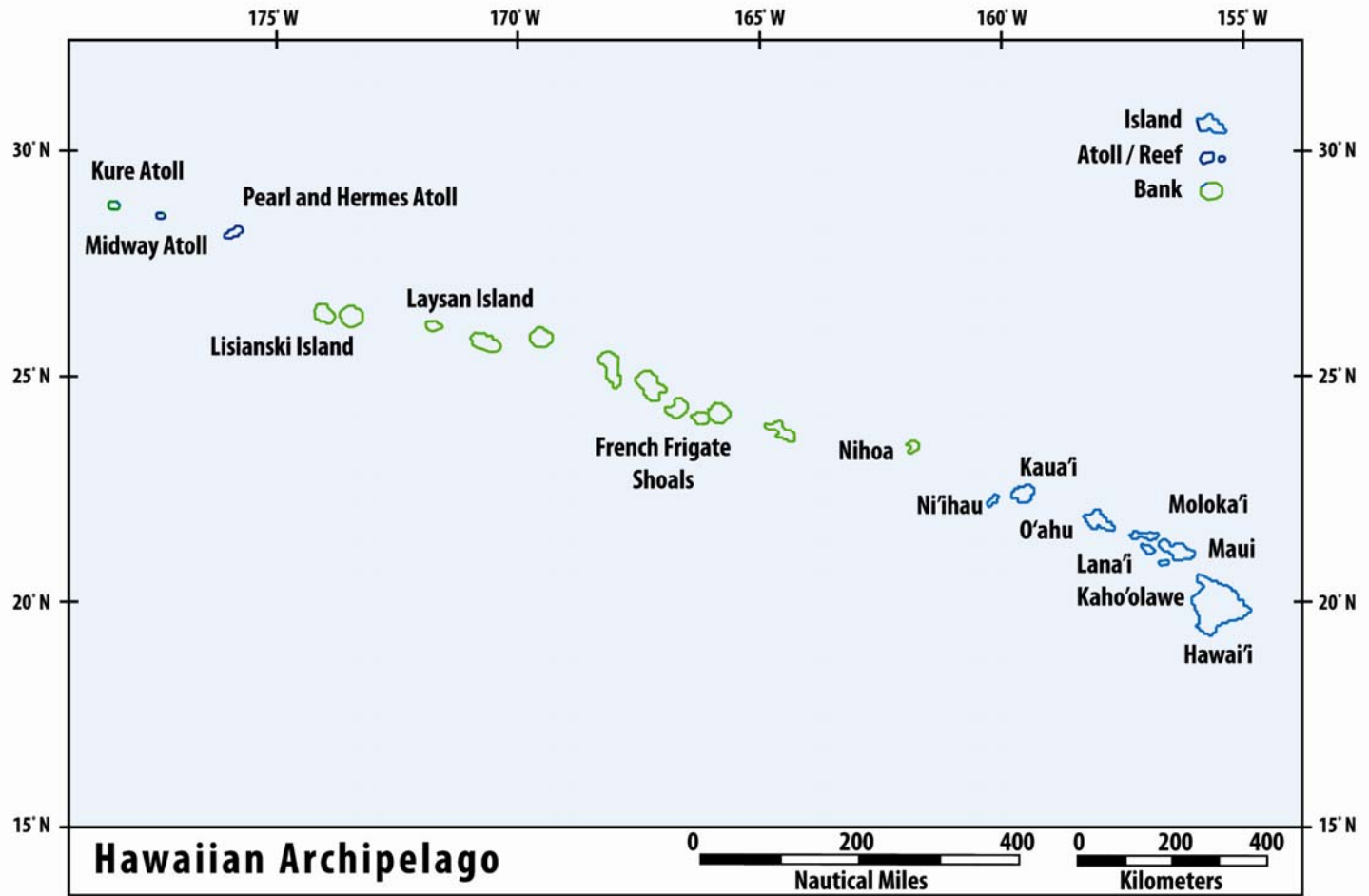


Recommendations

The findings contained in this report can be summarized into four specific recommendations:

1. Needs identified in this document have been identified on a Monument level, not an agency level. The Co-Trustees are responsible for each of their subordinate agencies, but facilities, assets, resources, and operations should be planned to take advantage of potential efficiencies and cost savings, with each agency supporting its peers whenever possible.
2. The next step is for a consolidated operational plan to be developed for each location within the Monument. This “business model” will allow the agencies to take advantage of potential synergies and partnerships at each location. Again, the needs of each agency will inform this effort, but the planning should identify solutions in the following sequence:
 - First by location (Midway, Kure, etc.)
 - Second by subject matter (housing, laboratories, etc.)
 - Finally, by responsible agency
3. Once this business model has been approved, the Co-Trustees should prepare a detailed program of requirements that identifies specifically what improvements are required at each location to address each area of need. That program of requirements is the precedent document to planning any physical improvements within the Monument.
4. Develop a strategy in order to obtain necessary funding to implement the recommendations outlined in the business model.

Refer to the following chapters for specific recommendations associated with each location.



Activities within the Monument

3



Activities Within the Monument

The mission descriptions of each stakeholder listed below are very condensed. These listings are only intended to provide a very general understanding of each activity.

NOAA Sanctuaries

PMNM

The Sanctuaries program does not currently have facilities at Midway. All activities at Midway, and elsewhere, are currently ship based.

Current Activities Include:

- Ship-based research
- Emergency response and evacuation
- Delivery of supplies

Future Actives Include:

- Four-person dive teams will make up to 14 trips per year to neighboring atolls. These teams will work off a research vessel and will only be transients at Midway.
- The ability to have two independent four-person dive teams at Midway simultaneously,

each with their own small boat, for the entire field season (May-October). These dive teams will fly in from Honolulu and stay approximately two weeks.

- Simultaneous 14-person classroom and lagoon based trips lasting from two to four weeks
- During the winter, the demand will decrease to one four-person dive trip per month (two week duration), plus a 14-person classroom and lagoon-based trip every other month
- Boats
 - Small boats are needed to provide transportation in and around Midway Atoll
 - A small research vessel (SRV) capable of launching two boats is needed to access nearby atolls or islands
 - Vessels could be based at Midway seasonably and would require facilities for vessel repair and crew
- Access to aircraft to fly personnel and scientific parties to/from Honolulu



NOAA Fisheries

PIRO/PIFSC

The Pacific Islands Regional Office provides the following activities, from their base of operations in Honolulu through their Pacific Islands Fisheries Science Center:

- Protected species conservation and research
- Emergency response

PIRO intends to undertake ship based research and ecosystem monitoring, and also expand its field presence over the next 15 years, integrating its own newly hired field staff with existing operations.

NOAA Fisheries

PIFSC CRED

The Coral Reef Ecosystem Division conducts ship-based multi-disciplinary research of fish, invertebrates, algae, and corals, in the Monument. They also lead a multi-partner effort to reduce and study the effects of derelict fishing gear on the coral reef ecosystems.

- Marine debris collection
 - Vessels typically leave Honolulu with empty cargo holds and return filled with debris
 - Vessels often deliver personnel and supplies to Midway and field camps in the NWHI

- The debris field season lasts up to four months in one-month rotations, staffed by 16 people
- Efforts are underway to determine the best method of detecting marine debris at sea using a combination of human observation, automated detection, and automated flight

It may be possible to split marine debris operations into a southern Honolulu-based effort and a northern Midway-based effort.

NOAA Fisheries

PIFSC PSD

The Protected Species Division activities originate from Honolulu on NOAA ships. Some of the research is ship-based, while much of it is based at remote field camps. PSD's research includes monitoring endangered Hawaiian monk seals, conducting shark and turtle research (jointly with FWS), and studying other endangered species.

- Currently two people are stationed at Midway year round providing captive care (this increases to six people part of year)
- Two cruises; May and August/September. The cruises support the Hawaiian monk seal research field camps
- Field camps consist of two or more persons at six locations living in tents or available buildings, depending on the site

- The camps are occupied from two to five months at a time
 - In addition to seal research, the Pearl and Hermes field camp conducts spinner dolphin research
 - Cruises are also undertaken to study Hawaiian monk seal foraging and cetaceans
- Future Activities Include**
- Spinner dolphin research will be expanded to other field camps
 - PSD intends to install permanent monk seal captive care holding tanks at Midway. Spinner dolphin surveys will also be expanded
- Visitor operations, including the logistics associated with receiving a visiting cruise ship and the hundreds of visitors who disembark
 - Plant propagation greenhouse
 - Wildlife and habitat management and restoration
 - Volunteer program management
 - Historical resources management



FWS

Midway Atoll National Wildlife Refuge

The FWS has multiple roles on Midway:

- Manage all activities within the refuge
- Operate and maintain Sand Island, including the harbor, utilities, infrastructure, and 100 + buildings, many of which are historic
- Coordinate with FAA for the operation of the airport on Sand Island, which also serves as an emergency landing site for trans-oceanic flights

There are permanent FWS employees, volunteers, and contractors who live and work on the island year round. Current activities include:



FWS

Hawaiian Islands National Wildlife Refuge

In addition to the activities at Midway, the FWS is also responsible for biological monitoring, endangered species recovery projects, habitat restoration, cultural resources protection, and controlling invasive species in the Hawaiian Islands. Specific activities include:

- Kure Atoll
 - Field Camps
 - Pearl and Hermes Atoll
 - Field camps in tents on Southeast Island
 - Lisianski Island
 - Does not currently have a field camp, nor is one projected in the future. However there are periodic short term projects that take place here
 - Laysan Island
 - Year round field camps in tents (these camps may be reduced in the future and Laysan may become a visitation site)
 - Small shadehouses for native species propagation
 - French Frigate Shoals
 - There is a year-round field station at Tern Island that houses permanent staff plus additional volunteers and research for up to three months
- Nihoa Island
 - Seasonal field camps in tents
 - There are two visits per year lasting several weeks each
 - Personnel arrive via either NOAA ship or charter vessel
 - Honolulu, Oahu
 - Staff and supplies to support field camp missions are staged from Honolulu. There is currently a 16 person bunkhouse. The complex also includes a small storage building and a quarantine facility
 - Hilo, Hawaii
 - Visitor's Center



State of Hawaii

Department of Land and Natural Resources

DLNR currently operates two summer camps on Kure Island. Current activities include:

- 2 summer camps spanning May-September
- Nature of work includes the following:
 - Seabirds
 - Vegetation
 - Marine debris
 - Spinner dolphin research and conservation
- Staff of four (combination of paid staff and volunteers)

Future Activities Include:

- Year-round field camp to address invasive vegetation and insects, broken into 4 rotations

Potential Synergies and Partnerships

4



Potential Synergies And Partnerships

The Monument provides an opportunity for the three Co-Trustees and the agencies they represent to come together and take advantage of potential synergies and partnerships. Although each agency has unique responsibilities, there are many areas where they can collaborate and work together. What is required for this to happen is to compare when the potential benefits of operating the Monument as a single entity is greater than the benefits of operating the Monument as a collection of independent agencies.

Centralized Logistics

By working together, the Co-Trustees can offer many opportunities to the individual agencies. Each agency needs to move people and supplies between the islands, and there are likely operational efficiencies and cost savings from coordinating. For example, PIFSC CRED charters large ships for debris removal several times per year. These ships return to Honolulu loaded with debris, but they begin their mission “empty” and could be used to ferry staff and supplies to the Monument, assuming there is coordination between agencies. A central field coordinator could act as the clearinghouse to accommodate

the needs of every agency with the space available on NOAA ships, USCG vessels, charter or university ships, aircraft, etc.

Common Support Services

Many of the agencies, including those already based at Midway, will benefit from having the improved access and infrastructure of an expanded field station. The majority of the personnel at Midway are seasonal and short-term staff who spend the rest of their time in Honolulu, or are in transit to conduct research on other islands. In order to avoid overbuilding, a centralized housing and dining operation is the most efficient way to accommodate the fluctuating demand for accommodations and support services at Midway. Just like the central transportation described above, one agency should be responsible for providing these services to all of the other agencies. Central accommodations could manage the demand for housing and dining. The same logic applies to other activities at Midway and to the field camps on the other islands.



Multi-disciplinary Research and Education

One of the current trends in research is cross-disciplinary collaboration. The Monument should expand upon current cross-disciplinary activities and encourage and support collaboration between researchers from different agencies, along with visiting researchers, educators, and volunteers. Instead of constructing (or renovating) space for each agency, the Monument should provide a nucleus of shared laboratory and classroom space, assigned on an “as needed” basis, and only assigned for the duration needed. Facilities should be designed to encourage cross-collaboration between staff from each agency and with visiting scientists, teachers, and students.

Prior to programming any improvements that are specific to any single agency, the Co-Trustees should further define each of these partnering opportunities.



Business Model

Prior to preparing a Coordinated Field Operations Plan for the Monument, the Co-Trustees should agree on a business model and prepare a business and operational plan. Key aspects include:

Integrated or Co-located

The Co-Trustees perform related functions throughout the Monument. There are two ways to think of these activities and the associated operational and physical improvements: Either they can be co-located but operationally separate, or they can be integrated. An integrated business model has the potential to increase utilization, avoid duplication, and reduce costs. Under an integrated business model, each of the Co-Trustees and their respective agencies retain their organizational autonomy, but physical improvements, assets, infrastructure, and where ever possible operations, are shared.

To understand the potential savings of an integrated business model, consider the following very simple example. Three departments within an agency each need conference room, but each only needs it a few times per week. Further, all three departments want to install technology to allow their conferences to be connected to other locations around the world. The three departments adopt an integrated model and build

one, very well equipped, conference room. The largest department takes on the role of scheduling the room, providing technical support for the sophisticated hardware, and cleaning and securing the room after each use. An inter-agency agreement defines all of the roles and responsibilities of each department, and sets out how each would contribute needed funds to pay for construction and ongoing operation.

The recommendations in this report assume that an integrated business model is adopted.

Operational Agreements

There are many areas where the agencies within the Monument can work together to achieve the operational efficiencies described in the example above. The largest is the physical operation of Midway, although there are opportunities for operational efficiencies at the other islands as well. Physical assets should be constructed (or renovated), operated and maintained by a single source, much like all buildings and assets on a college campus are usually centrally operated and maintained. A series of operational agreements between agencies can be written to cover the following shared assets and facilities:

- Long term and transient housing



- Food service for permanent residents, seasonal staff and transients
- Laboratories and educational classrooms
- A visitor center and visitor operations
- Medical facilities
- A marina/harbor to accommodate and service large ships, supply barges, and small boats owned by different agencies
- A fixed base operator (FBO) to accommodate and service visiting aircraft
- Infrastructure, including basic utilities plus up-to-date and communication technology
- Staging and storage facilities to support activities at Midway and on the other islands
- Transportation of personnel and goods to and from Midway and between Midway and the other islands
- Other ship and transportation needs

Areas of Costs

The business model should anticipate increased costs. The business and operational plan should budget for the following types of expenses and then identify adequate sources of revenue and/or appropriations:

1. Costs associated with personnel

The staffing within the Monument is projected to increase. Each projected increase in personnel also brings associated costs for salary or stipend, benefits, living expenses, transportation, equipment, and contract labor.

2. Costs associated with operations

Expanding the number of people and activities within the Monument, including the recommended new land based field station at Midway, will have a corresponding increase in operating costs, including, but not limited to, those associated with cost housing and food services, providing and maintaining the utilities infrastructure, transportation of people and supplies, maintaining the marina and FBO (aircraft) facilities, management and administration, etc.

3. Costs associated with capital improvements

The third area of cost is for capital improvements, such as renovations, new construction, upgrading the communication and data infrastructure, harbor and airfield improvements, etc. The next planning phase should identify specific capital projects and the costs associated with each project.

Summary of Need

6



Summary of Need

Overview of Requirements

Each of the roles described above translates into different physical needs at each location. There are needs for the following types of assets, depending on the location:

- Housing
 - For Permanent Staff
 - For Seasonal Staff
 - For Short Term Staff (on site for the duration of a project or activity)
 - For Transients and VIP
 - For Contractors (performing maintenance and operations at Midway)
- Support Facilities
 - Dining Facilities
 - Office Space
 - Laboratories, Classrooms, & Specialized Facilities (such as a visitor's center, a quarantine area, and other one-of-a-kind facilities)
- Marine Vessels and Associated Facilities
 - NOAA Ships
 - US Coast Guard Ships
 - Smaller Research Vessels
 - Supply Barges (other ships also bring supplies)
 - Small Boats
 - Maintenance, repair, machine shop, and parts storage
- Aircraft and Associated Facilities
 - Supply Aircraft
 - Enforcement Aircraft
 - Scientific Aircraft
 - FAA emergency landing operations
 - Maintenance, repair, machine shop, and parts storage



Definitions

Permanent Staff

Year-round. No one else can stay in their room when the permanent staff is off-site. (FWS and NOAA staff, port captain, airplane mechanic, etc.)

Contractors

Employees of the facilities management contractor

Seasonal Staff

On site between two and eight months. Can be scheduled with one or more other seasonal staff to occupy only one permanent lodging space. (Researchers, volunteers, film crew, contractors, etc.)

Short-term Staff

On site between one and eight weeks. Hotel-type accommodations with high turnover. (Researchers, volunteers, educators, etc.)

Transients

On site one to seven nights. Very short term, with very basic requirements. Dormitory style (Researchers in transit, evacuees, emergency responders, etc.)

Visiting Groups

On site 1-4 weeks. Visitors to the island who are not on site in an official capacity. Hotel-type

accommodations with high turnover. (School children, bird-watchers, divers, etc.)

Cruise Ship Passengers

On site one to seven days, daylight hours only. Vacationers stopping at Midway on a pleasure cruise. No lodging or dining requirements. (World War II veterans, Monument sightseers, etc.)

VIPs

On site one to three nights. Visiting dignitaries with entourage. Very nice accommodations, which may also be rented out to visiting groups

Primary Residence

Comfortable, private quarters for permanently stationed Co-Trustee staff, senior contractors, and VIPs only

Apartment

Comfortable quarters for all remaining permanently stationed staff

Hotel-type

High-density comfortable accommodations designed for high turnover and small footprint

Dormitory

Basic accommodations designed for high turnover and small footprint

Tent

Single-occupancy, temporary dwelling requiring minimal or no permanent infrastructure

Utilities Infrastructure

There are two types of utilities infrastructure planning that is required:

1. At Sand Island (Midway), where activities are primarily based in permanent structures
2. At each of the other islands, where utilities are required to support field camps

(At Kure and French Frigate Shoals there are a combination of permanent structures and field camps.)

This document broadly defines the demand for utilities at each location by quantifying the peak number of people and the types of support facilities. Planning to improve field utilities infrastructure should include appropriate engineering studies that will evaluate the current systems, compare alternative technologies, and then recommend individual solutions for each utility at each location.

Below is a list of required utilities, although not every utility is required at each location:

- Domestic potable water
- Fire water
- Sanitary sewer/wastewater

- Storm water runoff and catchment
- Electricity (generation and distribution)
- Data and telecommunications
- Solid waste disposal/removal
- Petroleum, oil and lubricants (for aircraft, ships, small boats, vehicles, and small motors) storage, distribution, and removal of waste products

There are four key questions related to planning infrastructure solutions each field site:

1. What is the status of the drinking water?
2. How is electricity generated?
3. How is human waste handled?
4. How is solid waste handled?

Two infrastructure reports were prepared in 2003. Refer to these documents for additional information related to infrastructure:

- Infrastructure Condition Assessment and Modification Midway Atoll MWR, GeoEngineers, 2003
- Midway Island Infrastructure Systems Evaluation and Conceptual Design, Lincoln Scott, 2003

Use and Condition of Existing Buildings

Also in 2003, a report was prepared that detailed the current use and condition, as well as related issues, such as historical significance, of all of the buildings at Midway:

- Midway Atoll Architectural Report, Jennifer W. Scott, AIA and Ferraro Choi and Associates, LTD, 2003

Costs

The cost to accommodate each requirement is a function of how an individual need is addressed. For example:

There is an identified need for an expanded visitor's center at Midway. It is not known at this time if the preferred solution will be to:

- Expand the current visitor's center
- Convert another existing building into a visitor's center
- Construct a new, stand alone visitor's center
- Some other option

Each potential solution has a vastly different cost associated with it. Identifying particular solutions

will occur during future planning, at which time a comprehensive budget can be established.

Sustainable Planning, Design and Operations

Whenever possible, all planning for facilities within the Monument should strive to attain LEED (Leadership in Energy and Environmental Design) certification, or a similar benchmark of green architecture. Sustainability and resource protection needs to be a core principle at every step of the development process. The Co-Trustees should adopt a measurable goal reduce conventional fuel consumption through a combination of conservation, green architecture, and renewable energy.

Requirements for Each Location

Because the recommendation is to identify solutions at the Monument level, the best way to present the facilities requirements that have been identified in this document is by location, instead of by agency. Defining requirements by location reinforces the synergies and operational efficiencies that are possible if planning is done on a "Monument-wide" basis. Therefore, requirements for all stakeholders have been consolidated for each location and are presented on the following pages.

A more detailed breakdown of the data collected for each location is contained in the spreadsheets in the appendix.

The requirements presented in this report represent a “best guess” at predicting the future needs of the Monument, so that more detailed planning can get underway. All requirements have been projected forward to 2022 and the number of people has been adjusted to reflect “peak demand” or the maximum number of people on-site at any one time.

Assumptions have been made in many areas, but many variables still need to be defined. For example, when projecting dining capacity, how many days would a visiting group be on-site at a field camp, and would they bring food with them?)

Future planning efforts should re-visit the data contained in this document, and a detailed program of requirements for each building at each locations should be prepared.

Requirements by Location

7



Kure Atoll

There are existing masonry buildings on Kure Atoll, but they are old and in bad repair. The staff lives in tents and uses the buildings for storage and offices. New housing should be constructed.

Kure Atoll has a runway, but it is no longer operational. The State of Hawaii has identified a need for a seaplane or float plane.

The presence of a barrier reef at Kure protects the lagoon and islands from large waves, improving the chances of access by small boat or seaplane during winter months.

Issues

- Need to increase the current space for housing and office space
- Need to triple the current amount of storage space
- Existing buildings need renovation
 - One contains three offices
 - One common room building
 - One storage shed
 - Buildings provide overwinter storage

Summary of Requirements Projected Forward to 2022

The number of people has been adjusted to reflect “peak demand” or the maximum number of people on-site at any one time.

People

Permanent Staff	3
Seasonal Staff	6
Visiting Groups.....	14

Assets Related to People

(Not including requirements for visiting groups)

Future Housing: Apartment or Dormitory	9
<i>(Buildings not currently used for sleeping)</i>	
Dining Capacity	9
Office Space	as needed

Vessels

NOAA, USCG, or University Ships yes
(Offshore, Transient)

Small Research Vessels yes
(Offshore, Transient)

Small Boats..... two

Aircraft..... yes
(Seaplane or float plane, as the runway is not operational)

Motor Fuel..... yes
(For two small boats)

Voice & Data Communications..... yes

Other Utilities Infrastructure

(Refer to chapter 6)

- Current power supply is inadequate
- Water catchment cistern needs repair

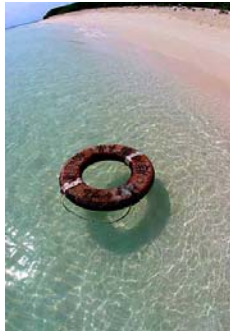
Transportation Requirements

- NOAA ships or flights from Honolulu to Midway with sea plane, float plane, or smaller vessel from Midway to Kure
- 50' or 80' ft. vessel based in Midway to support Kure
- Visiting large ships for cargo supplies and personnel transfers
- Use small boats to offload large ships
- Weight of cargo dropped off-22,000 lbs (16 boat loads)

- Weight of cargo picked up-6,000 lbs

Months of Operation

- 12 months is desired future activity
- NMFS monk seal camp runs from May to September



Midway Atoll (Sand Island)

Midway is the hub of facilities and operations within the Monument. The atoll is home to a national wildlife refuge and houses the Battle of Midway National Memorial. Midway's existing assets should be upgraded, downsized, and repurposed to more efficiently carry out current duties and accommodate a field station to serve NOAA, FWS, and the State of Hawaii. These enhanced capabilities will support and enhance current ship based operations and provide a home port from which to stage research trips, transport scientists, and re-supply field camps. It will also be the public's window into the Northwest Hawaiian Islands.

The presence of a barrier reef at Midway protects the lagoon and islands from large waves, improving the chances of access by small boat or seaplane during winter months.

Roles

Midway serves two overlapping functions:

1. It is the permanent land-based hub for the Monument
2. It serves as temporary staging area for the other Monument locations

Objective

- Transform Midway from an out-of-date, former military installation into a small, cross-disciplinary community that accommodates all of the requirements of the Monument
- This community would also serve as the "home base" for much of the research and activities that are occurring elsewhere in the Monument

Much like planning for a small college campus or research park, the future planning at Midway should develop a pedestrian oriented campus where each of the stakeholders will have the opportunity to interact with their counterparts from other agencies. The potential synergies and efficiencies will be very beneficial.

New or renovated facilities should be planned on "capability", not organizational structure. For example, a visitor's center should represent all aspects of the Monument. Similarly, laboratory space should be thought of as "trans-disciplinary," instead of planning discrete laboratories for each agency.

Planning for Midway's Needs

Future planning should accommodate the following types of facilities:

Research Space

- Flexible research and educational space, laboratories, and classroom facilities for visiting researchers and educators (the specific



programs and researchers will change over time)

- Captive care hub facility to enable transporting Hawaiian monk seals between islands and Honolulu. Facilities include holding tanks, water treatment and pumping equipment, and food prep area
- A quarantine facility including clean, segregated storage, staging areas, and freezing capabilities to freeze large pallets of supplies and 4'x4'x3' containers for a minimum of three days

Office Space

- Office space for permanent staff as well as for seasonal and short term researchers and support staff

Technical Infrastructure

- Up-to-date voice and data communications infrastructure to provide the latest "tele-presence" to connect the Monument with the world
- High-precision tide gauge and GPS receiver to enhance research capability, raising Midway's profile as a globally important research site

Basic Human Needs

- Housing for permanent staff plus shorter term lodging options (ranging from a few days to a few months)

- Facilities for researchers and support staff who are "transient," i.e. staging cruises to neighboring islands and atolls, or otherwise only stopping at Midway for a very short time
- Appropriate dining and recreation facilities
- Upgraded medical facilities and the ability to respond to emergencies anywhere throughout the Monument, including facilities to store and stage critical supplies
- Physical plant facilities to make it all run smoothly

Visitors Center

- An expanded visitor's center with the improved ability to accommodate large and small groups of visitors, VIPs, etc. This ranges from tourist groups arriving on small cruise ships to overnight visitors who are just stopping at Midway on their way to another island

Transportation and Operations

- Enhanced facilities for ships and aircraft that will compliment this new field station should also be enhanced
- Facilities to house and maintain at least one small research vessel (SRV) home-ported at Midway, plus additional capacity to accommodate two-to-four visiting larger NOAA, USCG, university, or charter ships

- Upgraded small boat piers, boat ramp, and maintenance facilities to accommodate the many small boats at Midway used by permanent research staff, short term researches, educational trips, and visiting divers
- Minimal FBO to manage existing airport facilities in support of enforcement, scientific, and transport flights landing at Midway and other islands. FBO should provide fuel, maintenance and overnight crew facilities (if not provided with other housing)
- Seaplane or floatplane that will provide improved access to the other islands

Issues

- The tug pier in the inner harbor can easily accommodate up to a 100 ft. boat. Larger vessels can dock here but with limited maneuverability. There are two large piers on the north side of the island, however they will require significant maintenance
- The island is supplied via three flights per month plus supply barges and visiting NOAA and charter ships
- A large, new fuel farm is being planned (not designed for refueling ships)

Summary of Requirements Projected forward to 2022

Projecting Requirements & Updating

The requirements presented in this report are based on many assumptions, including:

- A new land-based field station at Midway
- Growth of staff, programs, research, and activities
- Maximizing potential synergies between stakeholders
- An integrated business model embraced by each stakeholder

It is very likely that the underlying details of any individual assumption will be slightly off target, causing the projected requirements to need refinement. Also, there is an inherent margin of error when projecting forward fifteen years.

For these two reasons, individual quantities contained in this report should be looked at with the understanding that some of them are likely to change as the planning process moves forward. Periodic updating of these quantities is recommended.

The number of people has been adjusted to reflect “peak demand” or the maximum number of people on-site at any one time.

People

Permanent Staff..... 18

Seasonal Staff..... 52
 Contractors 65
 Short Term Staff & Transients..... 86
 Visiting Groups & VIPs..... 65
 Total..... 286
 Cruise Ship Passengers..... 800
(May not all be at one time; cruise ship visitors will likely sleep and eat on-board ship)

Assets Related to People

Housing: Primary Residence..... 18
(Excludes contractors)
 Housing: Apartment..... 117
(Contractors + seasonal staff)
 Housing: Hotel Type 65
(Visiting groups & VIPs)
 Housing Dormitory 86
(Transients)
 Office Space..... 36
+ Any contractors
 Dining Capacity..... 286
Excludes any cruise ship passengers

Other Facilities

Storage yes
 Quarantine Facility..... yes
 Dive Center with Chamber..... yes
 Laboratory..... yes

Educational Classrooms.....yes
 Greenhouse.....yes
 Monk Seal Facility and Holding Tanks.....yes
 Seal Food Prep Areayes
 Building & Grounds Maintenanceyes

Vessels

NOAA, USCG, or University Ships.....yes
(Transient)
 Small Research Vesselsyes
(Homeport or Transient)
 Barge.....yes
 Small Boatsyes
 Maintenance (Boats)..... yes
 Re-fueling Dieselyes
 Re-fueling Bio-dieselyes

Aircraft

Maintenance (Aircraft) yes
 Re-fueling-Jet Ayes

Voice & Data Communicationsyes

Utilities Infrastructureyes

Basic utilities, appropriate for the location, are required at all locations, i.e. Midway requires a permanent utility infrastructure while the other islands require field based technology.

(Kure Atoll and Tern Island at the French Frigate Shoals have both permanent structures and field based facilities.)

Transportation Requirements

- Six flights per month for supplies and personnel. Plane has capacity of 3,200 lbs., and seats 19
- Six cargo flights per year. Plane has capacity of 30,000 lbs
- Two supply barges per year
- One fuel barge per year
- Two visiting large ships per year
- Ability to support 30 field camps

Buildings and Square Footage

The projected area requirements listed below are very preliminary. More refined projections should be developed as future planning progresses.

Assets Related to People

Permanent Staff Housing

18 units at 1,200 sq. ft. 21,600 sq. ft.

Apartment Style Housing *(For Contractors and Seasonal Staff)*

10 at 1,200 sq. ft. 12,000 sq. ft.

107 at 600 sq. ft. 64,200 sq. ft.

Hotel Type Housing for Visiting Groups and VIPs

65 at 360 sq. ft. 23,400 sq. ft.

Dormitory Type Housing for Transients

86 at 120 sq. ft. 10,320 sq. ft.

Other Assets

Office Space

20 at 200 sq. ft. 4,000 sq. ft.

Dining *(Assume 2 1/2 turns and 75% seat utilization)*

Seating for 153 seats at 20 sq. ft. 3,060 sq. ft.

Servery at 10 sq. ft. 1,530 sq. ft.

Kitchen at 10 sq. ft. 1,530 sq. ft.

Storage at 10 sq. ft. 1,530 sq. ft.

Storage 10,000 sq. ft.

Quarantine Facility..... 1,200 sq. ft.

Dive Center with Chamber 2,400 sq. ft.

Laboratory

4 at 900 sq. ft. 3,600 sq. ft.

Educational Classrooms

4 at 900 sq. ft. 3,600 sq. ft.

Greenhouse 2,400 sq. ft.

Holding Tanks..... 3,600 sq. ft.

Seal Food Prep Area 1,200 sq. ft.

Building & Grounds Maintenance

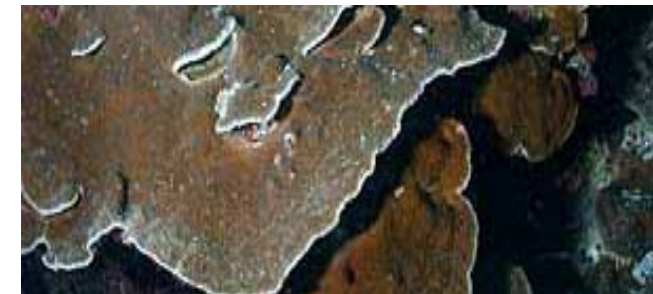
Office & Work Area. 1,200 sq. ft.

Storage & Vehicles..... 3,200 sq. ft.

Subtotal Programmed Area 175,570 sq. ft.

Total Projected Area

(Assume 75 % Building Efficiency) 234,000 sq. ft.





Pearl and Hermes Atoll

Issues

- Lodging is in tents
- Pearl & Hermes Atoll is prone to flooding.
- Desire permanent camp with elevated platforms that can withstand periodic island flooding
- The presence of a barrier reef at Pearl and Hermes protects the lagoon and islands from large waves, improving the chances of access by small boat or seaplane during winter months

Summary of Requirements Projected forward to 2022

The number of people has been adjusted to reflect “peak demand” or the maximum number of people on-site at any one time.

People

Permanent Staff..... 4

Seasonal Staff..... 4

Assets Related to People

Housing: Tents..... 8

Dining Capacity..... 8

Other Facilities..... none

Vessels

NOAA, USCG, or University Shipsyes
(Offshore, Transient)

Charter Vesselsyes
(Offshore, Transient)

Small Research Vesselsyes
(Offshore, Transient)

Small Boatsyes

Motor Fuelyes
(For small boats)

Voice & Data Communicationsyes

Other Utilities Infrastructure

(Refer to chapter 6)

Transportation Requirements

- Visiting large ships for cargo supplies and personnel transfers
- Use small boats to offload large ships
- Weight of cargo dropped off-13,000 lbs

Months of Operation

- Twelve months



Lisianski Island

Issues

The lack of a barrier reef leaves the shoreline unprotected from large surf, making access hazardous or impossible for much of the winter.

Summary of Requirements Projected forward to 2022

The number of people has been adjusted to reflect “peak demand” or the maximum number of people on-site at any one time.

People

Seasonal Staff.....	4
Short-term Staff.....	2

Assets Related to People

Housing: Tents.....	6
Dining Capacity.....	6

Vessels

NOAA, USCG, or University Ships.....	yes
<i>(Offshore, Transient)</i>	
Charter Vessels.....	yes
Small Research Vessels	yes
<i>(Offshore, Transient)</i>	
Small Boats.....	yes

Motor Fuelyes
(For small boats)

Voice & Data Communicationsyes

Other Utilities Infrastructure

(Refer to chapter 6)

Transportation Requirements

- Visiting large ships for cargo supplies and personnel transfers
- Use small boats to offload large ships
- Weight of cargo dropped off-300 lbs
- Weight of cargo picked up-300 lbs

Months of Operation

- NOAA PIFSC: May to August
- FWS: 1-2 weeks between March and October



Laysan Island

Issues

The lack of a barrier reef leaves the shoreline unprotected from large surf, making access hazardous or impossible for much of the winter.

Summary of Requirements Projected forward to 2022

The number of people has been adjusted to reflect “peak demand” or the maximum number of people on-site at any one time.

People

Permanent Staff.....	4
Seasonal Staff.....	10
Short Term Staff.....	4

Assets Related to People

Housing: Tents.....	18
Dining Capacity.....	18

Other Facilities

Shadehouses.....	yes
<i>(For native species propagation)</i>	
Hurricane Shelter.....	yes
Building & Camp Maintenance.....	yes

Vessels

NOAA, USCG, or University Ships.....	yes
<i>(Offshore, Transient)</i>	
Charter Vessels.....	yes
Small Research Vessels.....	yes
<i>(Offshore, Transient)</i>	
Small Boats.....	yes

Motor Fuel no
(For small boats)

Voice & Data Communicationsyes

Other Utilities Infrastructure

(Refer to chapter 7)

Transportation Requirements

- Two visiting large ships for cargo supplies and personnel transfers
- Use small boats to offload large ships
- Weight of cargo dropped off-3,000 lbs
- Weight of cargo picked up-13,000 lbs

Months of Operation

- Twelve months



French Frigate Shoals

Issues

- Unlike the other islands, Tern Island has a runway, barracks and warehouses, although they are in marginal condition
- The barracks and warehouse were built in 1976 and are in need of repair
- Although the barracks can house 20, infrastructure limitations on the island have kept the maximum population at 12. This needs to be addressed, as the projected population is anticipated to grow to 24
- The remaining parts of the old metal seawall (partially replaced in 2003) are corroded and in need of repair
- The Coast Guard dump on the shoreline is eroding lead and PCBs into the marine life. The dump has been partially removed, but needs to be removed completely
- Power supply is currently a limiting factor to operations and needs to be expanded
- The presence of a barrier reef protects the lagoon and islands from large waves, improving the chances of access by small boat or seaplane during winter months

Summary of Requirements Projected forward to 2022

The number of people has been adjusted to reflect “peak demand” or the maximum number of people on-site at any one time.

People

Permanent Staff	6
Seasonal Staff	18
Visiting Groups.....	20

Assets Related to People

(Not including requirements for visiting groups)

Housing: Primary Residence.....	6
Housing: Dormitory.....	18
Dining Capacity.....	24

Other Facilities

Storage.....	yes
Dive Center.....	yes
Laboratory	yes
Building & Camp Maintenance.....	yes

Vessels

NOAA, USCG, FWA or University Ships.....	yes
--	-----

(Transient)



Small Research Vessels yes
(Transient)

Barge yes

Small Boats..... yes

Maintenance *(Boats)* yes

Motor Fuel yes
(For small boats and vehicles)

Diesel Fuel yes
(For generators)

Aircraft yes
(Refueling)

Voice & Data Communications..... yes

Other Utilities Infrastructure

(Refer to chapter 6)

Transportation Requirements

- Eight flights per year for personnel transfers
- Three visiting large ships per year for cargo supplies and personnel transfers
- Use up to three small boats to offload large ships

Months of Operation

- Twelve months



Nihoa Island

Issues

The lack of a barrier reef leaves the shoreline unprotected from large surf, making access hazardous or impossible for much of the winter.

Summary of Requirements Projected forward to 2022

The number of people has been adjusted to reflect “peak demand” or the maximum number of people on-site at any one time.

(Note: Peak daily capacity of Nihoa is 8)

People

Seasonal Staff	5
Short-term Staff & Visitors	2
Visiting Groups	14

Assets Related to People

(Not including requirements for visiting groups)

Housing: Tents	7
Dining Capacity	7

Other Facilities..... none

Vessels

NOAA, USCG, or University Ships.....	yes
<i>(Offshore, Transient)</i>	

Small Research Vesselsyes
(Offshore, Transient)

Small Boatsyes

Motor Fuelyes
(For small boats)

Voice & Data Communicationsyes

Other Utilities Infrastructure

(Refer to chapter 6)

Transportation Requirements

- Visiting large ships for cargo supplies and personnel transfers
- Use up to three small boats to offload large ships

Months of Operation

- March to October



Honolulu, Oahu

Honolulu is the central operations, research planning, and administrative hub for all activity in the Monument. It contains NOAA’s Pacific Islands Fisheries Science Center, NOAA and FWS regional offices, and all of the relevant State of Hawaii offices. Honolulu is home to a large number of data analysts, administrators, and support staff who rarely enter the Monument itself. Agency offices are currently located in separate buildings throughout Honolulu, although all NOAA offices will be co – located within the time horizon of this planning document.

All activity initiated by the Co-Trustees that depends on ships and planes originates from Honolulu, including two NOAA ships, two University of Hawaii ships, several Coast Guard vessels, and charter vessels. Support facilities include NOAA ship piers, small boats, trailers and trucks, outdoor storage, container storage, heavy lifting equipment, workshops and tools, and a network of parts and services vendors.

The FWS Hawaiian Islands National Wildlife Refuge operates a 16 person dormitory and a staging warehouse on Honolulu.

People

Permanent Staff.....	41
Transients	16

Assets Related to People

Office Space.....	41
Housing: Dormitory	16
Dining Capacity.....	16

Vessels

NOAA, USCG, or University Ships	yes
Small Research Vessels	yes
Small Boats	yes

Motor Fuelyes
(For small boats)

Voice & Data Communicationsyes

Other Utilities Infrastructure

(Refer to chapter 6)

Transportation Requirements

- NOAA ship support staff and facilities
- Heavy lifting equipment, storage facilities, transport vehicles
- Access to Honolulu airport, possible seaplane ramp

Months of Operation

- Year-round



Hilo, Hawaii

Hilo is home to the Mokupāpapa Discovery Center for Hawaii’s remote coral reefs, the public face of the Monument in the main Hawaiian Islands. An educational center designed to raise awareness of the natural science, culture, and history of the Monument, the Discovery Center provides a venue to allow the public to vicariously experience the NWHI. The Discover Center receives 60,000 visitors a year.

People

Permanent Staff..... 4

Assets Related to People

Office Space 4

Voice & Data Communications..... yes

Months of Operation

- Year round

Consolidated Requirements Spreadsheet

Papahānaumokuākea Marine National Monument

The number of people has been adjusted to reflect "peak demand" or the maximum number of people on-site at any one time.

1. Kure Atoll

	Sanctuaries		Fisheries				FWS			State of Hawaii			USCG		Total			
	PMNM	PIFSC CRED	PIFSC PSD	PIRO	Midway NWR	Hawaiian NWR	Contractors	DAR	DOFAW	OHA								
	2007	2022	2007	2022	2007	2022	2007	2022	2007	2022	2007	2022	2007	2022	2007	2022		
People																		
Permanent Staff																	3	
Seasonal Staff			2	2		1						4	3				6	6
Short Term Staff																		
Visiting Groups	10											4	4				4	14
																	10	23
Assets Related to People																		
Housing: Primary Residence																		
Housing: Apartment or Dormitory	10			2		1							10					23
Housing: Tents			2								8						10	
Office Space			2	2		1					4	6					6	9
Dining Capacity	10		2	2		1					8	10					10	23
Other Assets																		
Storage													x	double				
Dive Center with Chamber																		
Laboratory														x				
Educational Classroom Space	x																	
Holding Tanks																		
NOAA or University Ships (Transient)																		
Small Research Vessels (Homeport or Transient)			x	x									x	x				
Barge																		
Small Boats	x		x	x		x							2	2				
Maintenance (Boats)													x	x				
Re-fueling Diesel																		
Re-fueling Bio-diesel																		
Re-fueling Gas			x	x		x							x					
Aircraft																		
Maintenance (Aircraft)																		
Re-fueling Jet A																		
Motor Fuel																		
Voice & Data Communications	x												x	x				

Consolidated Requirements Spreadsheet

Papahānaumokuākea Marine National Monument

The number of people has been adjusted to reflect "peak demand" or the maximum number of people on-site at any one time.

2. Midway (Sand Island)

	Sanctuaries		Fisheries				FWS			State of Hawaii			USCG		Total	
	PMNM	PIFSC CRED	PIFSC PSD	PIRO	Midway NWR	Hawaiian NWR	Contractors	DAR	DOFAW	OHA						
	2007 2022	2007 2022	2007 2022	2007 2022	2007 2022	2007 2022	2007 2022	2007 2022	2007 2022	2007 2022	2007 2022	2007 2022	2007 2022	2007 2022		
People																
Permanent Staff	6		2 2		4 10		50 65								56 83	
Seasonal Staff	20		6		4 6		15 20								19 52	
Transients & Short Term Staff	8		15 15	5 25	5 10		6 12		6 6			10			37 86	
VIPs & Visiting Groups	10			5 5	40 50										45 65	
															157 286	
Cruise Ship Passengers <i>(Will likely eat and sleep on-board ship)</i>															800 800	
Assets Related to People																
Housing: Primary Residence	6		2 2		4 10										6 18	
Housing: Hotel Type	18		15 15	10 30	45 60		6 12		6 6			10			82 151	
Housing: Apartment	20		6		4 6		65 85								117	
Office Space	26		2 8		8 16		x x								10 50	
Dining Capacity <i>(Excludes cruise ship passengers)</i>	44		17 23	10 30	53 76		71 97		6 6			10			157 286	
Other Assets																
Storage	x		x x		x x				x							
Dive Center with Chamber	x		x													
Laboratory	x		x		x											
Educational Classroom Space	x				x											
Holding Tanks			x													
Quarantine Facility	x		x	x	x	x	x	x								
NOAA or University Ships <i>(Transient)</i>	x x		x x	x x					x x							
Small Research Vessels <i>(Homeport or Transient)</i>	x		x x	x x								x				
Barge					x x											
Small Boats	x		x x		x x											
Maintenance <i>(Boats)</i>	x		x x		x x											
Re-fueling Diesel			x x		x x											
Re-fueling Bio-diesel	x		x x													
Re-fueling Gas	x		x x													
Aircraft	x		x x	x x	x x				x x			x x		x x		
Maintenance <i>(Aircraft)</i>	x								x x			x x		x x		
Re-fueling Jet A	x				x x				x x			x x		x x		
Motor Fuel	x		x x		x x											
Voice & Data Communications	x		x x	x x	x x				x x							



FACILITY
PROGRAMMING
AND CONSULTING



Frost Bank Tower, Suite 1100
100 West Houston Street
San Antonio, Texas 78205
Phone: 210/228-9600
Fax: 210/228-9697
facilityprogramming.com

Architectural Programming
Laboratory Planning
Healthcare Planning
Strategic Facilities Planning
Needs Assessment
Space Utilization Analysis

SAN ANTONIO | HOUSTON