

Action Plans to Address Priority Management Needs

- 3.1 Understanding and Interpreting the NWHI**
 - 3.2 Conserving Wildlife and Habitats**
 - 3.3 Reducing Threats to Monument Resources**
 - 3.4 Managing Human Uses**
 - 3.5 Coordinating Conservation and Management Activities**
 - 3.6 Achieving Effective Monument Operations**
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3.0 Action Plans to Address Priority Management Needs

The Monument Management Plan contains 22 action plans organized under six priority management needs. Each action plan is guided by a desired outcome, a specific need for action, and strategies and associated activities designed to achieve that need over a 15-year period with 5-year reviews. A projected timeline for completion is provided with most strategies in the action plans. These projected timelines begin once the Management Plan becomes final.

The strategies and activities described in each action plan were developed based on the current state of knowledge on the most appropriate management measures. Estimated costs to implement the Monument Management Plan are provided in Table 3.1 by action plan. The cost of administration and planning, field, and infrastructure development activities was estimated and combined for all agencies responsible for management of the Monument.

At the end of each Action Plan, a summary table lists which MMB agency has the lead for coordinating each activity. Lead agency designation does not necessarily relate to actual statutory, jurisdictional, or regulatory authority. However, lead agency does mean that agency will take the lead in providing much of the staff and other resources (such as, funding, volunteers, infrastructure, vessels, aircraft, etc.) to implement the activity and is responsible for coordinating with other agencies to monitor and report the progress of the project(s). It should be emphasized that other MMB agencies are encouraged to participate in shared decision-making and implementation of the activity.

The total estimated cost to implement the Monument Management Plan over the next 15 years is \$358,573,974. Roughly one-quarter of this amount are costs identified in Section 3.6.3, Coordinated Field Operations. Most of the coordinated field operations costs would be allocated to one-time infrastructure development activities designed to replace or enhance supporting infrastructure at existing field stations, rehabilitation of historic buildings at Midway, and increase transportation and enforcement assets Monument-wide.

This Monument Management Plan provides long-term guidance for management decisions over a 15-year horizon and sets forth desired outcomes, with strategies and activities to reach those outcomes, including the agencies' best estimate of future needs. These estimates are sometimes substantially above current budget allocations and are included primarily for agency strategic planning and program prioritization purposes. Neither this draft nor the subsequent final plan constitutes a commitment of funds, or a commitment to request funds, by federal or state agencies. All funding for current and possible future Monument activities is subject to the budgeting and appropriations processes of the federal and state governments.

Prioritization of activities in the management plan is not a linear process nor necessarily measured by the amount of funds allocated. Several factors apply when setting the implementation schedule and allocating funds; these include, but are not limited to, natural, cultural, and historic resource needs; funding; agency capacity; completion of necessary planning and environmental review; and community input and support. Each MMB and partner ICC agency develops annual budget projections and priorities and allocates funds based on its own

programmatic, legal and policy requirements. The cycle and timelines for funding and planning vary.

After five years, the Monument Management Plan will be reviewed, incorporating lessons learned and new data and information from monitoring, ecosystem science, and traditional knowledge, and a comprehensive evaluation to develop or refine management strategies and actions.

Table 3.1 Total Estimated Cost to Fully Implement Actions Plan by Year

Priority Management Need	Action Plan	Estimated Annual Cost							PMN Total	% of Total
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yrs 6-10	Yr 11-15		
Understanding and Interpreting the NWHI	3.1.1 - Marine Conservation Science	\$12,212,725	\$7,176,000	\$7,571,102	\$7,715,012	\$8,037,820	\$9,085,989	\$10,221,737	\$79,954,250	22%
	3.1.2 - Native Hawaiian Culture and History	\$698,714	\$943,562	\$906,970	\$959,103	\$968,227	\$1,132,697	\$1,323,155		
	3.1.3 - Historic Resources	\$692,285	\$736,296	\$787,952	\$827,326	\$867,493	\$2,106,913	\$1,556,014		
	3.1.4 - Maritime Heritage	\$364,011	\$383,035	\$412,626	\$430,122	\$480,403	\$583,894	\$773,067		
Conserving Wildlife and Habitats	3.2.1 - Threatened and Endangered Species	\$5,907,989	\$5,662,799	\$5,793,855	\$6,176,022	\$6,564,815	\$7,690,332	\$8,651,624	\$75,890,917	21%
	3.2.2 - Migratory Bird	\$1,876,886	\$1,943,362	\$2,012,385	\$2,211,292	\$2,381,961	\$2,960,635	\$3,246,340		
	3.2.3 - Habitat Management and Conservation	\$1,309,598	\$1,359,670	\$1,407,011	\$1,650,612	\$2,037,429	\$2,374,730	\$2,671,571		

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Reducing Threats to Monument Resources	3.3.1 - Marine Debris	\$1,606,097	\$1,480,770	\$1,862,218	\$1,808,975	\$2,158,530	\$2,471,537	\$2,780,229	\$41,237,446	12%
	3.3.2 - Alien Species	\$1,637,103	\$1,538,700	\$1,754,562	\$2,191,818	\$2,296,067	\$8,193,403	\$3,067,336		
	3.3.3 - Maritime Transportation and Aviation	\$297,324	\$296,285	\$265,592	\$290,264	\$281,121	\$316,261	\$355,794		
	3.3.4 - Emergency Response and Natural Resource Damage Assessment	\$532,898	\$531,087	\$561,755	\$582,483	\$606,759	\$692,931	\$779,547		
Managing Human Uses	3.4.1 - Permitting	\$843,611	\$788,642	\$750,839	\$766,012	\$815,317	\$917,232	\$1,031,886	\$26,593,569	7%
	3.4.2 - Enforcement	\$1,230,450	\$1,223,874	\$1,658,350	\$1,681,637	\$1,715,887	\$1,930,373	\$2,171,670		
	3.4.3 - Midway Atoll Visitor Services	\$868,395	\$1,090,763	\$1,140,574	\$1,291,051	\$1,305,934	\$1,586,386	\$1,784,684		
Coordinating Conservation and	3.5.1 - Agency Coordination	\$578,029	\$608,845	\$669,756	\$597,727	\$600,966	\$676,086	\$760,597	\$27,482,073	8%

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Management Activities	3.5.2 - Constituency Building and Outreach	\$1,163,068	\$1,527,334	\$1,448,710	\$1,359,120	\$1,431,473	\$1,658,847	\$1,865,578		
	3.5.3 - Native Hawaiian Community Involvement	\$369,330	\$381,977	\$433,122	\$427,368	\$461,456	\$540,859	\$632,901		
	3.5.4 - Ocean Ecosystems Literacy	\$1,037,593	\$1,045,054	\$1,241,202	\$1,278,892	\$1,271,596	\$1,560,868	\$1,853,719		
Achieving Effective Monument Operations	3.6.1 - Central Operations	\$933,000	\$976,260	\$1,365,116	\$1,211,354	\$1,374,602	\$1,611,589	\$1,886,344	\$107,415,720	30%
	3.6.2 - Information Management	\$843,350	\$985,745	\$1,089,193	\$1,106,350	\$1,153,712	\$1,297,926	\$1,460,167		
	3.6.3 - Coordinated Field Operations	\$2,746,185	\$6,876,156	\$15,832,853	\$5,734,067	\$10,850,138	\$28,038,706	\$16,454,795		
	3.6.4 - Evaluation	\$259,800	\$319,016	\$328,586	\$347,396	\$760,700	\$740,053	\$832,559		
Total Annual Cost		\$38,008,441	\$37,875,231	\$49,294,331	\$40,644,002	\$48,422,407	\$78,168,247	\$66,161,315		
Total 15-Year Estimated Cost								\$358,573,974		

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3.1 Understanding and Interpreting the NWHI

3.1.1 Marine Conservation Science Action Plan

3.1.2 Native Hawaiian Culture and History Action Plan

3.1.3 Historic Resources Action Plan

3.1.4 Maritime Heritage Action Plan

3.1 Understanding and Interpreting the NWHI

Protecting the health and integrity of the resources in the Monument is a key priority for resource managers. “Ecological Integrity” is defined by Monument regulations as a “condition determined to be characteristic of an ecosystem that has the ability to maintain the function, structure, and abundance of natural biological communities, including rates of change in response to natural environmental variation.” Protecting the integrity of cultural and historic resources is also a critical component of management. Management actions and decisions need to be informed by a solid understanding of Monument resources. Monitoring, research, and restoration are integral components that provide the data and analysis needed to take the appropriate management actions.

Resource managers and policymakers need comprehensive information about the ocean, and islands and atolls, and their natural and social environments to make wise decisions. The U.S. Commission on Ocean Policy (2005) and the President’s Ocean Action Plan have identified a number of areas of scientific inquiry fundamental to management. These topics include coral reefs, marine biodiversity, regional ecosystem dynamics, climate change, and social and economic research. Many of these apply directly to the NWHI. Baseline monitoring data and characterization are essential to identify natural and human-induced temporal changes and provide the basis for evaluating whether management activities are effective or need to be modified based on changing conditions. The Monument Management Plan reflects these nationally recognized natural and social science needs for ecosystem-based management.

The NWHI consist of a complex assemblage of ecological, cultural, and historic resources in relatively undisturbed condition compared with the main Hawaiian Islands and many other marine-based ecosystems in the world (Freidlander et al. 2005). The Monument represents a unique opportunity to improve management decision making, to advance management-driven ecosystem science through research on ecosystem components and processes, and to develop models and other tools to predict ecosystem responses to natural and anthropogenic perturbations, such as climate variability and change. In addition to the Native Hawaiian cultural significance of the region, submerged maritime heritage resources, such as shipwrecks and sunken aircraft, and other historic and archaeological sites provide insight into the NWHI’s rich past.

Agencies responsible for caring for this extraordinary place include the State of Hawai‘i, FWS, and NOAA. Establishment of the Monument provides a management framework that encourages, facilitates, and directs coordinated management, preservation, research, education, and planning with other partners. Universities and other research organizations are also integral to building knowledge about the NWHI. As our understanding of the NWHI’s ecological, cultural, and historic resources improves, so will our capacity to achieve effective and long-term protection of this special place. A more complete understanding of the NWHI will provide insights for improved management throughout the Hawaiian Archipelago.

Action plans to understand and interpret the NWHI focus on characterizing and monitoring the region from multiple perspectives. They also emphasize sharing information with partners and the public in relevant ways.

Each action plan consists of a set of strategies to address a desired outcome. Over the next 15 years, these desired outcomes are:

- **Marine Conservation Science:** Protect the ecological integrity of natural resources by increasing the understanding of the distributions, abundances, and functional linkages of marine organisms and their habitats in space and time to improve ecosystem-based management decisions in the Papahānaumokuākea Marine National Monument.
- **Native Hawaiian Culture and History:** Increase understanding and appreciation of Native Hawaiian histories and cultural practices related to Papahānaumokuākea Marine National Monument and effectively manage cultural resources for their cultural, educational, and scientific values.
- **Historic Resources:** Identify, document, preserve, protect, stabilize, and, where appropriate, reuse, recover, and interpret historic resources associated with Midway Atoll and other historic resources within Papahānaumokuākea Marine National Monument.
- **Maritime Heritage:** Identify, interpret, and protect maritime heritage resources in Papahānaumokuākea Marine National Monument.

Action plans described in this section will be implemented in close coordination with other partners and in conjunction with other priority management needs.

3.1.1 Marine Conservation Science Action Plan

Desired Outcome

Protect the ecological integrity of natural resources by increasing the understanding of the distributions, abundances and functional linkages of marine organisms and their habitats in space and time to improve ecosystem-based management decisions in the Papahānaumokuākea Marine National Monument.

Links to other Action Plans	
3.2.1	Threatened and Endangered Species
3.2.2	Migratory Birds
3.2.3	Habitat Management and Conservation
3.3.1	Marine Debris
3.3.2	Alien Species
3.5.1	Agency Coordination
3.6.2	Information Management
3.6.3	Coordinated Field Operations

Current Status and Background

Scientific endeavors in the NWHI were motivated in part by conservation goals as early as 1920, when the Tanager Expedition included people engaged in not only collection of specimens but eradication of invasive species and restoration of habitats damaged by introduced herbivores at Laysan Island. The Pacific Ocean Biological Survey Program carried out by the Smithsonian Institution, while not explicitly designed for conservation purposes, laid the foundation of our knowledge of seabird populations and movements at sea. The Tripartite agreement among the State of Hawai‘i, FWS, and NOAA Fisheries provided a framework for extensive ecological research in the NWHI beginning in 1976. Interwoven with these large institutional efforts are numerous independent research projects that continue to contribute to the body of knowledge available for science-based resource conservation.

Links to goals
Goal 2
Goal 4
Goal 6
Goal 7

Multiagency efforts continued when the Northwestern Hawaiian Islands Reef Assessment and Monitoring Program (NWHIRAMP, historically known as NOWRAMP), was initiated in 2000 to characterize and monitor the coral reefs of the NWHI using a consistent set of sampling protocols. The Reef Assessment and Monitoring Program establishes a baseline for future data gathering and monitoring change over time. NWHIRAMP is a collaborative partnership of agencies and institutions consisting of quantitative diver surveys of fish, coral, algae, and invertebrate communities, supplemented by towed diver surveys of large fish and substrate type, oceanographic data collection, and sediment contaminant studies (Maragos and Gulko 2002).

Other annual multi-agency efforts are supported by a variety of agencies and institutions, including the University of Hawai‘i’s Hawai‘i Institute of Marine Biology (HIMB). This research partnership focuses on conservation science and has produced many key findings that have management implications, not just within the Hawaiian archipelago, but also for the maintenance of healthy coral reef ecosystems around the world. HIMB’s ongoing research on genetic connectivity, tagging studies, disease outbreaks, coral health, threat assessments, and climate change will be used to inform managers’ understanding of the NWHI and help to create a holistic view of ecological structure and function to ensure the best protection of the Monument’s valuable resources. The Monument acts as an ideal site to understand ecosystem function and responses to natural and anthropogenic events in a site largely free from direct human impacts. This provides a unique opportunity to understand how healthy ecosystems

respond to change and compare these natural responses with other sites with greater human impact. This understanding will be important for evaluating the effects and ecological implications of climate change in the Monument, as compared with other sites particularly around the Pacific.

In another multi-agency project, NOAA led a significant mapping effort using satellite imagery, multi-beam sonar, and other remote sensing methods to provide detailed maps of the shallow-water seabed features of the Northwestern Hawaiian Islands, including the *Draft Atlas of the Shallow-Water Benthic Habitats of the NWHI* (NOAA 2003b) and the *Bathymetric Atlas of the NWHI* (Miller et al. 2004). These documents begin to describe the marine habitats and bathymetry of the NWHI and establish important baseline information for resource managers. Efforts are under way to expand the coverage of the bathymetry data, interpret the multi-beam backscatter imagery, develop a ground-truthing database, and verify remotely sensed information to further refine and complete these characterizations. The expanded habitat mapping efforts will provide managers with a greater understanding of the available resources as well as provide fundamental data for a variety of modeling efforts such as modeling the effects of climate change.

In May 2003, NOAA, through a multiagency partnership, convened a workshop with NWHI resource managers and researchers from the scientific community to identify information and science needs and resources for effective conservation and management of the NWHI. The results from this workshop were analyzed and summarized in a report titled *Information Needs for Conservation Science and Management of the Northwestern Hawaiian Islands* (Gittings et al. 2004). Workshop results are incorporated into planning and coordination efforts of science and management activities in the NWHI, and research gaps identified by the workshop informed the drafting of the archipelago wide, multiagency Hawaiian Archipelago Marine Ecosystem Research Plan (HAMER). In November 2004, the NWHI Third Scientific Symposium was held in Honolulu, Hawai‘i, and provided further syntheses of the current state of knowledge and management of the NWHI (Macintyre 2006).

Building on these earlier planning efforts, and in light of the complexity and depth of conservation science needs in the Monument, the MMB expanded the development of a stand-alone Natural Resources Science Plan to further identify management priorities, assess and identify standard protocols, formalize collaborative monitoring, and increase effectiveness of protection and management efforts. A scoping meeting for the draft Natural Resources Science Plan was held in November 2007 to solicit input on five broad thematic research categories. The five thematic areas adapted from the HAMER Plan and identified in the draft Natural Resources Science Plan are:

- Research on ecological processes and connectivity
- Research on biodiversity and habitats
- Research on human impacts
- Research on ecosystem change, indicators, and monitoring
- Modeling and forecasting ecosystem change



Biologists survey algae and coral species throughout the NWHI to monitor ecosystem health. Photo: Jean Kenyon

Need for Action

Effective stewardship of the Monument should be based on reliable information on the biological characteristics of the organisms, their ecological relationships, an understanding of the natural temporal variations, and anthropogenic impacts that affect their ecosystems.

It is important to continue and further enhance monitoring efforts to protect and conserve the Monument's flora and fauna. Conducting annual monitoring will provide for an assessment of the continued health of the NWHI. Akin to monitoring vital signs such as heartbeat and blood pressure in humans, monitoring the abundance and diversity of marine organisms allows managers to track health and establish baselines and the range of natural variability throughout the year and between years. These baselines help to identify change over time and can be used in many ways; from assessing the status of groups of organisms, to assessing the effects of management and restoration efforts, to studying the impact of larger-scale phenomena, such as climate change on ecosystems. Monitoring can also be used as a broad-scale warning system, to assess changes, or to identify when management actions need to be modified based on changing conditions. Changing resource conditions may also prompt managers to request more specific research and seek actionable results to best protect and preserve the Monument.

Although monitoring and research are deemed an integral part of the Monument Management Plan, great care will be taken to ensure that the research conducted in the Monument is necessary for the continuation and enhancement of resource protection. The permitting process and future Natural Resource Science Plan (NRSP) will continue to specify that the benefits of data acquisition will outweigh the impacts of conducting these activities.

Recognizing the value of and need for greater understanding of marine habitats, continued characterization and monitoring of marine habitats and species are described within this Action Plan. Because of the connection between marine and terrestrial species, communities and ecosystems, additional management-related surveys, research, and monitoring priorities that span marine and terrestrial habitats are also found in separate action plans within this Monument Management Plan, in particular Threatened and Endangered Species, Migratory Bird, Habitat Management and Conservation, Marine Debris, and Alien Species Action Plans. With coral reefs, seabird colonies, and tropical ecosystems in decline in general around the world, the NWHI present a unique opportunity to characterize an intact ecosystem and begin to understand the degree of natural variability in an ecosystem relatively free of local anthropogenic influences. Studying these remote areas may also make an important contribution toward understanding the impacts of global climate change on coral reef ecosystems. The NWHI are still relatively unexplored, and fundamental information on the species, habitats, and their status is needed to best protect these resources in perpetuity. Functional relationships among the species, habitats, ecosystems, and oceanographic and other physical processes of the NWHI marine environments are also not well understood. Evaluation tools, such as models, are needed to describe complex ecosystem functions and provide resource managers with the capability to assess both the benefits and risks of management decisions.

Strategies to Achieve the Desired Outcome

There are three strategies designed to achieve the desired outcome of protecting ecological integrity by increasing the understanding of the distributions, abundances, and functional linkages of marine organisms and their habitats in space and time to improve ecosystem-based management decisions in the Monument. Systematic characterization, monitoring, and research are means to acquire this information. Strategy MCS-1 and its associated activities are specific to the marine environment, while strategies MCS-2 and MCS-3 apply to all research and monitoring activities in the Monument. The strategies and activities are coded by the acronym for the action plan title, Marine Conservation Science (MCS). A summary of strategies and activities is provided in Table 3.1.1 at the end of this action plan.

- MCS-1: Continue and enhance research, characterization, and monitoring of marine ecosystems for the life of the plan, as appropriate.
- MCS-2: Assess and prioritize research and monitoring activities over the life of the plan.
- MCS-3: Communicate results of research and monitoring over the life of the plan.

Strategy MCS-1: Continue and enhance research, characterization and monitoring of marine ecosystems for the life of the plan, as appropriate.

This strategy is focused on continuing marine research, characterization, and monitoring designed to support an ecosystem-based approach to protection and management. These activities are implemented through a variety of partnerships and collaborations, including those with the University of Hawai‘i’s HIMB, Hawai‘i Undersea Research Lab (HURL), School of Ocean and Earth Science Technology, and others. Findings will be synthesized and made available for managers to inform decision making, as well as to the general public. Additional marine research and monitoring activities are found in the Threatened and Endangered Species, Migratory Bird, Habitat Management and Conservation, Marine Debris, and Alien Species Action Plans.

As ecosystem characterization assessments are moving ahead, analysis of data from regular monitoring surveys can be used to evaluate change over time in a given ecosystem. Monitoring data can help scientists understand the causes of change and be used to build ecosystem models. Producing high-level ecosystem functional models can be achieved only through broad-based collaborations among agencies and institutions with varying capacities. It is critical that monitoring protocols be established in collaboration with partner agencies so that they may yield reliable, useful information over time. To the extent possible, relevant datasets will be integrated with the national Integrated Ocean Observing System efforts.

Activity MCS-1.1: Continue to characterize types and spatial distributions of shallow-water marine habitats to inform protection and management efforts.

The MMB will continue working with partners to conduct field work to validate and update existing habitat maps and bathymetry. This work will build on remote sensing data originally collected in the development of the *Draft Atlas of the Shallow-Water Benthic Habitats of the NWHI* and the *Bathymetric Atlas of the NWHI*, Draft. The updated dataset, maps, and images will provide a framework for the biogeographic assessment in Activity MCS-2.3, described below. The results of these activities will better define resource baselines to inform protection

and management efforts. Shallow-water habitats are defined as those less than 16 fathoms (30 meters).

Activity MCS-1.2: Continue monitoring of shallow-water coral reef ecosystems to protect ecological integrity.

Monitor shallow water habitats using sampling protocols developed through interagency collaborative efforts. Sites selected should be representative of broad habitat types. Quantitative surveys of coral, algae, fish, and invertebrates will be conducted annually using methods comparable to or intercalibrated with those of existing historical data sets. This monitoring will be conducted in collaboration with partners. The suitability of these methods, data sets, and analyses to meet management needs will be periodically assessed with partners as described in Activity MCS-2.2, and are subject to change based on the outcomes of that activity. The results of these activities will better define resource baselines for comparisons in protection and management efforts.

Activity MCS-1.3: Map and characterize deep-water habitat.

As resources in this habitat are virtually unknown in the NWHI, it is imperative to understand the dynamics of deep-water habitat to protect and manage them in the future. Working with partners, the MMB will use data collected with the multibeam sonar systems to acquire both bathymetric and backscatter data and produce deep-water benthic habitat maps. Habitat maps will be ground-truthed using remote cameras, submersibles, and other technology, as appropriate. This work will continue to develop baseline inventory of the biological resources and biodiversity of deep reefs, seamounts, banks, and abyssal plains using all available technologies, including submersibles, remotely operated vehicles (ROV), autonomous underwater vehicles (AUV), and technical diving. Deep-water habitats are defined as those greater than 16 fathoms (30 meters). Research investigations will be continued on the deep coral reef, deep slope, seamount, pelagic, and abyssal ecosystems of the NWHI.

Activity MCS-1.4: Establish and implement monitoring program for deep-water ecosystems, as appropriate.

Using the shallow-water ecosystem monitoring protocols as a model, protocols will also be developed for deep-water ecosystems. In collaboration with research partners, the Monument will determine management information needs and establish data collection protocols, statistical sampling design, and site selection criteria for monitoring of deep-water ecosystems, as well as implement monitoring of deep-water reefs, banks, and associated communities to meet these management information needs. All appropriate technologies and methods will be utilized, including submersibles, ROVs, AUVs, bait station drop cameras, and technical diving. Monitoring of key indicator species will be implemented if determined to be a key monitoring tool.

Activity MCS-1.5: Measure connectivity and genetic diversity of key species to enhance management decisions.

Genetic studies can provide data to compare the similarity or differences of populations at different locations across the NWHI. Understanding the genetic diversity of species, and the ways in which an area's populations change, helps managers forecast, prepare for, and mediate potential threats to populations. Identifying the genetic makeup of populations can help

managers understand more about the effective size of a population, its history of immigration from other populations, and the level of genetic diversity inherent in the population. This information is helpful in understanding the various fish stocks, as well as whether the NWHI serve as a source for recruits to the MHI. Comparisons of the population genetics at different sites in the Monument may indicate whether those populations are distinct and must be managed separately or whether the population in question can be considered as the same throughout the archipelago. Population connectivity can be assessed using genetic assays across a broad range of coral reef invertebrates and fishes with widely varying life history characteristics. Understanding the genetic diversity of species provides important information into how anthropogenic influences, such as debris accumulation, pollution, and climate change, can be evaluated Monument-wide. Population connectivity can be assessed using genetic assays across a broad range of coral reef invertebrates and fishes with widely varying life history characteristics.

Activity MCS-1.6: Collect, analyze, and input research, monitoring, and bathymetric data into appropriate databases to inform management decisions.

Information management is critical for organizing and storing large numbers of published and unpublished manuscripts and research findings, as well as for analyzing and summarizing large amounts of data and other research products. Because of the complexity of information management from multiple sources, it is imperative that such an endeavor be conducted in close collaboration with interagency and research partners (see Section 3.6.2 Information Management Action Plan, Activity IM-1.2). Such collaborations necessitate the flow of information to and from other established agency databases, such as NOAA's Coral Reef Watch Program, NOAA's Coral Reef Information System (CoRIS), DLNR's seabird and dolphin database, and the multiagency online Oceanographic Atlas of the Pacific. The Monument Information Management System, as well as other databases, will be updated on a regular basis to manage, analyze, summarize, and interpret research data collected from the NWHI to best protect Monument resources. Products, such as maps and reports on the status and trends of important resources in the NWHI, will be generated from these databases for researchers and managers.

Strategy MCS-2: Assess and prioritize research and monitoring activities over the life of the plan.

A management-driven Natural Resources Science Plan will be developed and assessed on a regular basis to ensure that marine and terrestrial research and monitoring conducted in the NWHI are appropriate, relevant, and necessary to ensure ecological integrity is maintained, enhance effective management, improve management decision making, advance ecosystem science, include traditional knowledge, and begin to understand the impacts of climate change. The plan will build on existing regional science and research planning efforts. Consistency with HAMER and links to similar research in the main Hawaiian Islands will be maintained so that science conducted in this portion of the archipelago can be used across the archipelago. An interdisciplinary range of investigations designed to protect resources and inform management actions will be included in the plan.

Activity MCS-2.1: Develop a prioritized Natural Resources Science Plan to support protection and management activities within 1 year.

Working collaboratively, the MMB will develop a prioritized, interdisciplinary NWHI Monument NRSP. The NRSP will serve as a more detailed implementation plan that supports protection, management and research strategies contained within this action plan, as well as specific management-related surveys, research, and monitoring priorities found in other Action Plans, in particular the Threatened and Endangered Species, Migratory Bird, Habitat Management and Conservation, Marine Debris, Alien Species, and Native Hawaiian Culture and History Action Plans. It will align management priorities among agencies to facilitate resource and information sharing and will address both baseline information needs and management-driven needs, with the ultimate goal of ensuring that the health and ecological integrity of the Monuments resources are protected. The NRSP will be a stand-alone document separate from that of the Monument Management Plan, with its own federal and state environmental review. Each agency or research partner will use the plan as a guide for conducting and authorizing research activities. Information needs and gaps will be reevaluated on a regular basis with input from the MMB, ICC, technical groups, research partners, Native Hawaiians, and the public. The NRSP will also address monitoring requirements to understand the direct and indirect impacts of climate change on species, populations and ecosystems.

Examples of activities to be included in the NRSP under the five thematic areas are:

Research on ecological processes and connectivity

Understanding the mechanisms that link NWHI populations (and where applicable to the main Hawaiian Islands) at various scales, such as oceanographic processes, recruitment variability, larval and adult behavior, bird migratory and foraging patterns and drivers, the effect of isolation on the genetic structure of terrestrial flora and fauna, and other life history characteristics, will reveal the connectivity and interrelationships of the ecosystems within the NWHI.

Research on biodiversity and habitats

Documenting, maintaining, and restoring diversity includes the discovery and description of new species, identifying the spatial distributions of habitats critical for the survival of native species, determining habitat changes important for the survival of native species, and maintaining diversity by affecting the recovery of protected species. This activity may include the study of methods for the restoration of native habitats, plants, and animals; research on terrestrial arthropods and avian components of the biological community; research on circulation patterns, residence times of water, wave climatology, and other physical drivers that structure habitats and result in biological zonation of the marine and terrestrial environments.

Research on human impacts

Understanding the impacts of human activities on the ecosystems of the NWHI may include research on the cumulative impacts of both local (e.g., research, other permitted activities) and distant (marine debris, fishing, climate change) activities, as well as the impact of invasive species on the marine and terrestrial biodiversity of the NWHI. Comparative studies between the main Hawaiian Islands and NWHI provide a unique opportunity to examine the effects of anthropogenic activities on coral reef ecosystems.

Research on ecosystem change, indicators, and monitoring

Establishing baselines on the abundance and health of Monument biota is the first step toward understanding the range of natural variability that characterizes these ecosystems. Research will address marine and terrestrial biodiversity and communities. Coral bleaching follow-up surveys and assessments will be continued with regional research partners to assess the impacts of major bleaching events in 2002 and 2004. Research to define and understand factors contributing to resilience and recovery from these perturbations will assist managers in responding to future bleaching events. The use of indicator species as a monitoring tool will be evaluated.

Modeling and forecasting ecosystem change

Developing functional ecosystem models that reflect the complexity and dynamic nature of the ecosystems of the NWHI is a long-term goal of the Monument's research program. A related goal is to design models that reflect ecological connectivity of the NWHI to the main Hawaiian Islands and other regions of the Pacific. Descriptive and predictive models will be used by managers to better understand ecosystem function, and to evaluate the impacts of proposed activities.

Activity MCS-2.2: Assess monitoring program protocols.

Consistency in data collection protocols over time is of primary importance in any monitoring program in order to enable statistically valid comparisons between time periods. As management needs evolve and our understanding of ecosystem variability improves, monitoring protocols, sampling design, and sampling intervals will be evaluated for their effectiveness in meeting management needs and accurately reflecting change in the environment. An overall goal of these periodic assessments will be to ensure that the sampling and site selection protocols adequately represent the range of habitats in the NWHI, and that the methods provide adequate statistical power to detect differences between sites or changes between time periods and that the data are useful to and informs management decisionmaking. These evaluations will be conducted on a cycle consistent with 5-year management plan reviews with the interagency technical group on research.

Activity MCS-2.3: Formalize collaborative regional monitoring programs for the NWHI.

Several independent monitoring initiatives are being conducted in the NWHI and new initiatives are planned, such as monitoring for invasive species, seabird colonies, the effectiveness of Monument management zones, water chemistry, and water quality. Monitoring programs will need to include data on the organisms in the NWHI in a wide range of habitats as well as oceanographic and climatological parameters. Monument zones, which are spread across a broad distance and include a range of habitats, will require the design of an efficient yet effective monitoring program to maximize protection and management efforts. The Monument will facilitate the development of formal monitoring programs that are closely linked to the needs of NWHI resource managers. Partnerships with collaborating agencies and organizations will be established in which responsibilities, obligations, deliverables, and timelines for a regional monitoring program are clearly articulated.

Activity MCS-2.4: Implement management-driven research priorities identified in the Monument Natural Resources Science Plan.

Once the Monument Natural Resources Science Plan is finalized, priorities identified in the plan will guide research and monitoring activities for both marine and terrestrial environments that will in turn provide the necessary information for effective management actions. These priorities will be reassessed on a regular basis based on the outcome of research and monitoring activities, outcome of evaluation assessments, the 5-year reviews of the Monument Management Plan and regular reviews of the Science Plan. Research and monitoring priorities will be implemented through a variety of partnerships and collaborations.

Activity MCS-2.5: Coordinate research update meetings.

Regular meetings among managers, staff, and researchers will be conducted to facilitate the exchange of information and ensure the management-driven Monument research objectives identified in the NRSP are being met.

Strategy MCS-3: Communicate results of research and monitoring over the life of the plan.

Research is an exciting way to promote ecosystem literacy and caring for the NWHI. Ecosystem research-related education and outreach present an ideal opportunity to “bring the place to the people and not the people to the place.” This strategy serves a dual purpose of presenting the science to a general audience and promoting the research necessary to manage the Monument. In addition, research and modeling discoveries can be shared with the public and incorporated into classroom curricula. Activities contained within this strategy apply to terrestrial and marine research and monitoring activities in the Monument.

Activity MCS-3.1: Coordinate an annual meeting to present current research in the NWHI.

Annual meetings provide an important forum for the NWHI multidisciplinary research community, managers, and interested public to keep abreast of current research initiatives and recent findings. This meeting will seek to incorporate recent findings from research, including but not limited to, ecosystem, Native Hawaiian, maritime heritage, and socioeconomic studies.

Activity MCS-3.2: Identify and prioritize research, monitoring, and modeling projects for education and outreach.

Translating NWHI research findings to the public and incorporating it into classroom curricula is a high priority for the Monument. Working with partner agencies, research, monitoring, and modeling projects will be identified and prioritized for dissemination.

Activity MCS-3.3: Include an educational component in marine research expeditions.

Past NOWRAMP/NWHIRAMP expeditions have included educational components that have been highly successful for education and outreach. Components included live web sites with updates from the research vessel, imagery, and video. Using this model and other innovative ideas, marine research and monitoring expeditions aboard NOAA research vessels will include educational and outreach components.

Activity MCS-3.4: Use materials gathered and created through research to develop or enhance education and outreach products.

Many of the materials developed during previous marine research expeditions have been incorporated into other outreach products, specifically displays at the Mokuāpāpapa Discovery

Center, slideshows, and educational curricula. Similarly, educational materials have been associated with satellite tracking of albatross and migration of golden plovers. Education and outreach products will continue to be developed based on research conducted in the Monument. (See Section 3.5.4, Ocean Ecosystems Literacy Action Plan).

Table 3.1.1 Summary of Strategies, Activities, and Agency Leads for Marine Conservation Science

Strategies and Activities	Agency Lead
Strategy MCS-1: Continue and enhance research, characterization and monitoring of marine ecosystems for the life of the plan, as appropriate.	
Activity MCS-1.1: Continue to characterize types and spatial distributions of shallow-water marine habitats to inform protection and management efforts.	NOAA
Activity MCS-1.2: Continue monitoring of shallow-water coral reef ecosystems to protect ecological integrity.	NOAA
Activity MCS-1.3: Map and characterize deep-water habitat.	NOAA
Activity MCS-1.4: Establish and implement monitoring program for deep-water ecosystems, as appropriate.	NOAA
Activity MCS-1.5: Measure connectivity and genetic diversity of key species to enhance management decisions.	NOAA
Activity MCS-1.6: Collect, analyze, and input research, monitoring, and bathymetric data into appropriate databases to inform management decisions.	NOAA
Strategy MCS-2: Assess and prioritize research and monitoring activities over the life of the plan.	
Activity MCS-2.1: Develop a prioritized Natural Resources Science Plan to support protection and management within 1 year.	NOAA
Activity MCS-2.2: Assess monitoring program protocols.	NOAA
Activity MCS-2.3: Formalize collaborative regional monitoring programs for the NWHI.	NOAA
Activity MCS-2.4: Implement management-driven research priorities identified in the Monument Natural Resources Science Plan.	NOAA FWS
Activity MCS-2.5: Coordinate research update meetings.	NOAA
Strategy MCS-3: Communicate results of research and monitoring over the life of the plan.	
Activity MCS-3.1: Coordinate an annual meeting to present current research in the NWHI.	NOAA
Activity MCS-3.2: Identify and prioritize research, monitoring, and modeling projects for education and outreach.	NOAA
Activity MCS-3.3: Include an educational component in marine research expeditions.	NOAA
Activity MCS-3.4: Use materials gathered and created through research to develop or enhance education and outreach products.	NOAA

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3.1.2 Native Hawaiian Culture and History Action Plan

Desired Outcome

Increase understanding and appreciation of Native Hawaiian histories and cultural practices related to Papahānaumokuākea Marine National Monument and effectively manage cultural resources for their cultural, educational, and scientific values.

Links to other Action Plans	
3.1.1	Marine Conservation Science
3.1.3	Historic Resources
3.5.2	Constituency Building and Outreach
3.1.4	Maritime Heritage
3.5.3	Native Hawaiian Community Involvement
3.5.4	Ocean Ecosystems Literacy
3.6.2	Information Management

Current Status and Background

Since the early visioning process in 2000 on how best to protect the NWHI, the need to understand and document the cultural significance of the Monument and its integral relationship with the rest of the archipelago has been growing, leading to an increased effort to research and compile known cultural information about this important region. This research effort has produced a substantial amount of cultural information and theories pertaining to the traditions and practices of Native Hawaiians in the NWHI (Kikiloi in prep.). This work includes archival research (Tava and Keale 1989; Mackenzie and Kaiama 2003), ethnographic studies (Maly 2003), and archaeological research (Emory 1928; Cleghorn 1988; Liller 2000; Graves and Kikiloi in prep).

Links to goals
Goal 4
Goal 5
Goal 6
Goal 7

While more cultural research needs to be conducted, several steps have been taken toward integrating this cultural information into educational and outreach efforts. One of these efforts is “Navigating Change,” an education and outreach partnership created in 2001 among NOAA, FWS, the State of Hawai‘i, the Polynesian Voyaging Society, Bishop Museum, and many other groups. This initiative, which includes classroom curricula and multimedia materials, utilizes Native Hawaiian voyaging traditions and cultural values to engage students and the public in learning about and caring for the NWHI as well as the main Hawaiian Islands. Together, the Polynesian Voyaging Society, FWS, NOAA, and the State coordinated voyages by *Hōkūle‘a*, a traditional Hawaiian double-hulled voyaging canoe, to and through the NWHI, as well as the associated educational outreach efforts for the voyages.



Cultural sites at Mokumanamana indicate the use of the NWHI and surrounding oceans by Native Hawaiians in precontact Hawai‘i. Photo: Andy Collins

To effectively engage both English and ‘ōlelo Hawai‘i (Hawaiian language) speakers, and to explicitly recognize the Native Hawaiian history and continued relationship with Papahānaumokuākea, all interpretive signs at Mokupāpapa Discovery Center in Hilo and similar education centers are in both English and ‘ōlelo Hawai‘i. Native Hawaiian values and histories are integrated into the displays, and Hawaiian-speaking volunteers have been recruited to act as docents at Mokupāpapa.

The Reserve, in collaboration with the Kamakakūokalani Center for Hawaiian Studies at the University of Hawai‘i, conducted cultural research on the NWHI. This research and synthesis have yielded a university-level course on the NWHI and an informational video that portrays the NWHI from an indigenous perspective. In August 2004, the Kamakakūokalani Center held a 2-day workshop to discuss Native Hawaiian issues and concerns about the NWHI (see also Section 3.5.3, the Native Hawaiian Community Involvement Action Plan).

Also under contract with the Reserve, the Bernice Pauahi Bishop Museum developed an online “Annotated Bibliography of Cultural Resources for the Northwestern Hawaiian Islands.” The database contents primarily include holdings available in the Bishop Museum’s Library and Archives, the libraries at the University of Hawai‘i at Mānoa, and the State of Hawai‘i Archives that may be valuable to researchers and others learning about the NWHI. The database is accessible to the public on the Internet (www2.bishopmuseum.org/noaanwhi/index.asp).

To strengthen the agencies’ cultural resource management capability, internal capacity and a liaison program will be developed. Under such a program, liaisons with the Hawaiian community would conduct projects and initiatives to support cultural education, research, and access. The liaisons would work with the Native Hawaiian community, plan and organize cultural working group meetings, and coordinate cultural research and outreach for the Monument (see also Section 3.4.3, the Native Hawaiian Community Involvement Action Plan). Through a Native Hawaiian cultural perspective, we can learn more about the NWHI’s ecosystems and histories and develop better ways of managing the area.

Need for Action

Both the executive order that established the Reserve and Proclamation 8031, which established the Monument, recognize and address the significance of the NWHI to Native Hawaiians. Understanding the NWHI from a Native Hawaiian perspective benefits the Monument in many ways. Native Hawaiians’ resource management practices were and are mainly guided by their traditional beliefs and familial connections to their natural environment and the imperative to manage the islands and oceans as inextricably linked. As a result, Native Hawaiian research contributes to an ecosystem-based approach to management and complements other types of research. Education of and by, and outreach to, the Native Hawaiian community can elicit greater involvement by Native Hawaiians in Monument management. Utilizing cultural information in education and outreach will engage the broader public in learning about and caring for the Monument and Native Hawaiian culture. This action plan presents strategies and activities for research, education, and outreach aimed at accomplishing that desired outcome.

More research and documentation about Native Hawaiian traditions, practices, and histories of the NWHI need to be done, particularly before the histories held only in the oral tradition are lost with the kūpuna who hold that knowledge. Some of this work can be accomplished through literature searches and other historical, Hawaiian language, and archival research. Other information will require access to the NWHI to conduct new cultural research by both academics and practitioners. As information is gathered and compiled information regarding the location, character, or ownership of certain cultural resources may be withheld from public disclosure, consistent with applicable law such as the National Historic Preservation Act.

The Monument offers a vast, sacred, and protected classroom, which cannot be recreated or modeled anywhere else, for Native Hawaiians or the rest of the world. For example, the experiential learning of traditional wayfinding and cultural protocols by crewmembers of the *Hōkūle‘a* and other Polynesian voyaging wa‘a (canoes) cannot be learned in a museum or from books. Equally, the historic sites of Nihoa and Mokumanamana represent the most pristine and extensive collection of cultural sites within the Hawaiian archipelago and are being used as a training ground for cultural practitioners who wish to continue to practice such cultural protocols as can only be rediscovered in Papahānaumokuākea. Native Hawaiian cultural tradition is primarily transmitted orally, and current educational studies have shown that Native Hawaiian learning continues to be most productive when done experientially (Tibbetts 2006).

As a result, and as allowed by applicable laws, cultural accesses to promote and expand traditional knowledge may include a component that allows for observational learning and experiences, which help translate in part to building relationships with both the place and the people of the place. These interpersonal relationships with fellow researchers may be as important as ancestral connections that are also related to Papahānaumokuākea. Experiences gained in Papahānaumokuākea are absorbed over time, with information and knowledge earned that potentially may be understood or implemented after the actual experience. Only if relationships with the place, spirits, and people of the place are maintained can the experiential knowledge be appropriately shared and used at the right time. Western scientific terms such as “baseline” and “assessment” are not necessarily used the same way in Hawaiian traditional knowledge, and as such cultural research should not be limited in scope or manner by any such terminology.

Strategies to Achieve the Desired Outcome

Five strategies have been identified to increase understanding and documentation of Native Hawaiian culture and history related to the Monument. The strategies and activities are coded by the acronym for the action plan title, “Native Hawaiian Culture and History” (NHCH). A summary of strategies and activities is provided in Table 3.1.2 at the end of this action plan.

- NHCH-1: Identify and prioritize scientific and Native Hawaiian cultural research needs within 18 months.
- NHCH-2: Conduct, support, and facilitate Native Hawaiian cultural access and research of the NWHI over the life of the plan.
- NHCH-3: Increase cultural resource management capacity across MMB agencies over the life of the plan.
- NHCH-4: Plan, develop, and implement a Monument Cultural Resources Program over the life of the plan.
- NHCH-5: Provide cultural outreach and educational opportunities to serve the Native Hawaiian community and the general public over the life of the plan.

Strategy NHCH-1: Identify and prioritize scientific and Native Hawaiian cultural research needs within 18 months.

Identification and prioritization of research needs will be achieved through consultation with the Native Hawaiian Cultural Working Group and other Native Hawaiian institutions and organizations, and by assessing and identifying gaps in the information assembled in the past in consultation with what was then the Reserve Advisory Council's Native Hawaiian Cultural Working Group and other cultural experts. Potential research topics include (1) understanding the historical relationship Native Hawaiians have had with the NWHI; (2) understanding cultural practices of this region, such as navigation and voyaging, traditional religious worship, place names and geography, mele (song) and hula (dance), mo'olelo (legendary histories, mythologies, and stories), and fishing techniques; (3) determining culturally and ecologically appropriate methods of following the Hawaiian protocol of giving ho'okupu (offerings); (4) acquiring and implementing traditional Hawaiian knowledge; (5) increasing research to support and identify sites for protective status; and (6) clarifying how Hawaiian concepts of restoration and preservation of natural and cultural resources fit into current regulatory constraints. Research on these topics will give insight into the appropriateness of certain activities and practices that occur in the area.

Activity NHCH-1.1: Identify research needs that can be accomplished through anthropological, archaeological, historical, and Hawaiian cultural methods.

Such research could be conducted through ethnographic interviews, researching oral traditions and archival historical information written in the English and Hawaiian languages, archaeological survey and analyses, and cultural field experience. Potential topics include further study into the history of Nihoa and Mokumanamana's previous inhabitants, the human-made structures on those islands, and cultural links throughout the archipelago—especially for residents of Ni'ihau and Kaua'i with the NWHI. Research needs will be developed within 18 months and consistently updated via such venues as the annual cultural resources research conference (see Section 3.4.3, the Native Hawaiian Community Involvement Action Plan).

Activity NHCH-1.2: Develop cultural research priorities alongside associated management challenges and opportunities.

Once research needs have been identified, priorities will be established by the MMB in consultation with the Native Hawaiian Cultural Working Group that are directly linked to key management challenges and available opportunities to conduct such research. These needs and priorities will be assembled in a report that will be completed within 18 months.

Strategy NHCH-2: Conduct, support, and facilitate Native Hawaiian cultural access and research of the NWHI over the life of the plan.

Ongoing research and documentation about Native Hawaiian traditions, practices, and histories of Papahānaumokuākea are as important as ongoing scientific research in helping us ensure successful management of the Monument. Thus, working closely with partners, we will continue to conduct and support cultural and historical research and seek ways to facilitate access to the NWHI for such purposes. The MMB will also work to support complementary Western science and traditional knowledge investigations, management, and outreach strategies. This work will be done in cooperation with partners, both organizations and individual researchers. Additionally, research findings may help clarify appropriate cultural activities for an area and aid in gaining appropriate additional protections for cultural resources.

Cultural accesses will incorporate opportunities for the perpetuation and expansion of traditional knowledge, including natural resources conservation and management. Such accesses may emphasize the interconnectivity of the entire Hawaiian archipelago and assist Native Hawaiian practitioners in reconnecting to the natural resources knowledge and experience of their ancestors, which will further assist them in teaching and practicing traditional resource management in the main Hawaiian Islands as well as assist managers of Papahānaumokuākea. Native Hawaiian mele (songs), oli (chants) and mo‘olelo (stories) that refer both to the NWHI and to natural resource abundance are best understood when observed and experienced first-hand. The NWHI provide a unique opportunity to continually experience and view a sizeable portion of the Hawaiian archipelago much as Native Hawaiian ancestors once did. As Native Hawaiian practitioners connect with and experience the natural and cultural resources through the eyes of their ancestors, they also become aware of an inherent kuleana (responsibility and privilege) to foster the possibility of ‘ōuli (ancestral signs or omens expressed through nature) and biophysical and spiritual understandings of the environment.

All of these types of cultural research findings would be integrated and presented as part of an annual meeting to present current research being conducted in the NWHI (see Section 3.1.1, the Marine Conservation Science Action Plan). This annual meeting provides an important forum for the NWHI multidisciplinary research community, managers, and interested public to keep abreast of current research initiatives and recent findings.

Activity NHCH-2.1: Continue to compile information and conduct new cultural and historical research about the NWHI.

Limited cultural and historical research about the NWHI has already been directly conducted by NOAA and FWS in conjunction with partner organizations such as OHA and the Bishop Museum. Monument staff will continue to compile existing information about the region and initiate new research based on the priorities developed under strategy NHCH-1.

Activity NHCH-2.2: Support Native Hawaiian cultural research needs.

Once priorities have been developed, access needs to meet these priority requirements will be considered and established as opportunities arise to create additional partnership contracts, grants, or formal agreements with Native Hawaiian organizations and individuals. Research on the issues identified through the process described in strategy NHCH-1 may also be supported by the MMB through grants, logistical support, berthing space aboard research vessels (see Section 3.6.3, the Coordinated Field Operations Action Plan), and other in-kind resources. Such support has already begun prior to Monument establishment and will be continued.

Activity NHCH-2.3: Facilitate cultural field research and cultural education opportunities annually.

Consistent with activities that have already begun in the Monument, the MMB will continue to facilitate research and education opportunities in the field for students, teachers, and cultural specialists during every field season. Such support includes providing berthing space aboard research vessels, logistical support, and putting researchers and educators in touch with others doing similar work.

Activity NHCH-2.4: Convene a Native Hawaiian nomenclature working group.

Within a year, the Monument will convene a variety of experts, including the Native Hawaiian Cultural Working Group, on the history and meaning of Hawaiian names for known and yet-to-be-discovered regions, islands, geographical and oceanic features, sites, and plant and animal species. These names and their histories and meanings will be included and updated regularly in the forthcoming Monument Information Management System (see below) to ensure that such names continue to reflect Hawaiian knowledge and experience, and processes will be established to ensure that the Native Hawaiian names are imbued with appropriate cultural authority and officially recognized in government records.

Activity NHCH-2.5: Incorporate cultural resources information into the Monument Information Management System.

As cultural information is compiled and generated, in collaboration and cooperation with Native Hawaiian organizations and institutions that are also creating databases of such information (such as OHA's *Wahi Pana* Database), it will be incorporated into the Monument Information Management System (see Section 3.6.2, the Information Management Action Plan). This system will incorporate a security layer for the protection of proprietary cultural information.

Activity NHCH-2.6: Continue to facilitate Native Hawaiian cultural access.

Such access needs may include, but not be limited to (1) access to the NWHI by cultural practitioners for Hawaiian religious practices and ceremonial purposes; (2) regular access for Polynesian voyaging canoes for wayfinding, navigational, and cultural protocol training; (3) gathering specific types of plants, shells, and feathers for cultural implements and ceremonies; (4) repatriating iwi kūpuna (ancestral bones) and monitoring burial sites; (5) honoring ancestral homelands and their associated deities; (6) restoring native species; and (7) observing and reconnecting with natural and spiritual resources. These types of access allow for lessons to be learned at specific sites for specific purposes and to determine significant astronomical relationships, and provide for voyaging training in a voyaging route of Native Hawaiians' kūpuna. Voyaging training provides for traditional navigational apprenticeship in an ancient art, which Hawaiians conceive as learning to pull an island out of the sea from beyond the horizon using only observation and knowledge of the natural environment.

Activity NHCH-2.7: Establish agreements with local universities and museums to address possible curation, research, use, return, and repatriation of collections.

To provide proper stewardship of cultural resources and artifacts, necessary agreements will be established in concert with the Cultural Resources Program Plan (see strategy NHCH-4). Other agreements will be developed as the need arises, including, but not limited to, negotiation for agreements to be initiated within 18 months with the Bishop Museum and University of Hawai'i about inventories, curation, and access of existing cultural resources currently in their control.

Strategy NHCH 3: Increase cultural resource management capacity across MMB agencies over the life of the plan.

To effectively carry out the strategies and activities outlined within this action plan, the MMB agencies will increase their collective capacity to effectively understand, manage, and protect the

Native Hawaiian cultural resources of the Monument and fulfill federal and state mandates and requirements.

Activity NHCH-3.1: Assess Monument cultural resource capacity.

Limited staff capacity currently exists among the Monument management agencies in the area of cultural resource management. Agencies will identify staff needs and work toward building staff capacity to carry out the strategies and activities contained within this plan. Staffing needs will be identified and included in the development of the Monument Cultural Resources Program Plan (see Activity NHCH-4.1).

Activity NHCH-3.2: Engage Native Hawaiian practitioners and cultural experts and the Native Hawaiian Cultural Working Group in the development and implementation of the Monument's management activities.

The Native Hawaiian Cultural Working Group and other Native Hawaiian cultural practitioners and experts will be consistently consulted and integrated into the creation and implementation of programs (see Section 3.5.3, the Native Hawaiian Community Involvement Action Plan). Examples of their participation may include the following: (1) providing cultural briefings to every person preparing to enter the Monument, as a condition of being permitted access; (2) when feasible, accompanying permittees accessing the Monument to experience, practice, and learn from the Monument resources while educating others; and (3) including Native Hawaiians, particularly the younger generations, as part of cultural and scientific research teams when feasible.

Activity NHCH-3.3: Increase knowledge base of Native Hawaiian values and cultural information through "in-reach" programs for resource managers.

Efforts will be made to increase the knowledge base of Native Hawaiian cultural significance by Monument resource managers. This knowledge base will be increased by having Monument resource managers and staff and MMB members, as appropriate, participate in informal and formal briefings, cultural workshops, and cultural exchanges in cooperation with other marine protected area sites that integrate traditional knowledge into their management.

Activity NHCH-3.4: Identify and integrate Native Hawaiian traditional knowledge and management concepts into Monument management.

In the past, traditional resource management involved recognizing local variations, observing patterns, periodically applying kapu (restrictions on resource extraction and other activities) by konohiki (local managers), and maintaining a deep respect for, and intimate knowledge of, the environment. The MMB will work with the Native Hawaiian community and other cultural experts to identify how traditional knowledge and associated practices may be integrated into Monument management and research activities. A report on traditional knowledge and management practices, including recommendations for integrating these perspectives into management of the NWHI, will be developed to guide implementation.

Strategy NHCH-4: Plan, develop, and implement a Monument Cultural Resources Program over the life of the plan.

All cultural resources in the NWHI are under the jurisdiction of the Monument, and therefore the MMB will support efforts to protect these important elements, including archaeological sites and the sacred resources of the NWHI, according to the parameters and conditions included within Sections 106 and 110 of the National Historic Preservation Act. This strategy may include documenting and evaluating the NWHI as a Traditional Cultural Property and development of a Cultural Resources Program to fully integrate cultural resource protection into Monument management (see Activity HR-3.2 in Section 3.1.3, Historic Resources Action Plan).

Activity NHCH-4.1: Prepare a Cultural Resources Program Plan.

Within 18 months, the MMB will initiate the development of a Cultural Resources Program Plan, in partnership with the Native Hawaiian Cultural Working Group, cultural practitioners and experts, and others. As part of the plan development, the program partners will identify cultural resources, sites, and other locations within the Monument that are appropriate for use in contemporary Native Hawaiian protocols. In addition, the plan will include policies and procedures on the collection, curation, and disposition of archaeological materials, other artifacts, and human remains. The MMB and partners will complete the plan within two years of initiation.

Activity NHCH-4.2: Develop and implement specific preservation and access plans, as appropriate, to protect cultural sites at Nihoa and Mokumanamana.

Both Nihoa and Mokumanamana are recognized as culturally significant, are listed on the National Register of Historic Places, and are protected by the FWS in accordance with the National Wildlife Refuge System Administration Act of 1966, as amended, and the National Historic Preservation Act of 1966. To further protect these sites, preservation plans for both islands will be developed and implemented, as will access plans for other cultural elements and yet-to-be discovered sites within the Monument. These preservation plans will address the monitoring and stabilization of cultural sites and return/repatriation agreements with museums and institutions that house the artifact collections. These preservation plans will be initiated within 18 months.

Activity NHCH-4.3: Initiate implementation of the Monument Cultural Resources Program.

Within six months of completion of the Cultural Resources Program Plan, the MMB will initiate the strategies and activities contained within the plan.

Strategy NHCH-5: Provide cultural outreach and educational opportunities to serve the Native Hawaiian community and the general public over the life of the plan.

Native Hawaiian values and cultural information will be used to guide outreach and education programs to serve both Native Hawaiians and the general public. Native Hawaiian values and resource management practices can be relevant to multiple audiences and help to provide a more complete understanding of the NWHI and the need to protect its ecosystems and other cultural resources. Permittee education and outreach programs will target Monument users.

As requested by the Native Hawaiian Cultural Working Group, staff will strive to provide more outreach to the Native Hawaiian community so that the cultural information compiled and incorporated into Monument materials reaches Native Hawaiians, many of whom otherwise may

not have access to such information. Developing culturally relevant materials can also make information more accessible and engaging to Native Hawaiians. For example, making Hawaiian language tours available at Mokupāpapa Discovery Center would increase the center's value and accessibility to Hawaiian language immersion school groups as a culturally relevant learning tool. The Native Hawaiian Cultural Working Group, Native Hawaiian community leaders, cultural experts, and others will be consulted for cultural accuracy and appropriateness and for input on how information is used and shared.

Activity NHCH-5.1: Integrate Native Hawaiian values and cultural information into general outreach and education programs.

Cultural information and traditional Native Hawaiian values will be infused into education and outreach materials aimed at the general public. The “Navigating Change” program, school curricula, promotion of Hawaiian place names in Monument materials, videos, articles, and the lecture series at Mokupāpapa are some of the ways the MMB will accomplish this activity (see Sections 3.5.2 and 3.5.4, Constituency Building and Outreach and Ocean Ecosystems Literacy Action Plans).

Activity NHCH-5.2: Develop a culturally based strategy for education and outreach within the Native Hawaiian community.

This strategy, to be developed within three years, includes making information relevant, attractive, and accessible to Native Hawaiians. Outreach and education designed with and for Native Hawaiians will be accomplished through special events, cultural groups, schools (K-12), and colleges. Products that may be developed include videos and public television programs, publications, and school curricula. Traditional products will be encouraged, such as hula, mele, and oli. The MMB will continue to utilize ‘Ōlelo Hawai‘i in outreach and education materials and programs as appropriate (see Sections 3.5.2 and 3.5.4, Constituency Building and Outreach and Ocean Ecosystems Literacy Action Plans).

Activity NHCH-5.3: Integrate Native Hawaiian values and cultural information into the Monument permittee education and outreach program.

Within two years, the MMB will provide appropriate cultural information and guidelines to all Monument users and will help in fostering a deeper respect for the NWHI through better understanding of, and respect for, Hawaiian values and the cultural significance of the place (see Section 3.4.1, Permitting Action Plan). This activity includes, but is not limited to, the cultural briefing required prior to any permitted access to the Monument; the creation of a course for permit applicants that would engage in experiential approaches to maximize learning through various modalities; the development of a cultural observer program; and the creation of comprehensive research sources, such as willing cultural experts, libraries, and electronic databases of cultural and historical information with security layers for confidential information, which will assist applicants in appropriately completing permit applications.

Table 3.1.2 Summary of Strategies, Activities, and Agency Leads for Native Hawaiian Culture and History

Strategies and Activities	Agency Lead
Strategy NHCH-1: Identify and prioritize scientific and Native Hawaiian cultural research needs within 18 months.	
Activity NHCH-1.1: Identify research needs that can be accomplished through anthropological, archaeological, historical, and Hawaiian cultural methods.	OHA
Activity NHCH-1.2: Develop cultural research priorities alongside associated management challenges and opportunities.	OHA
Strategy NHCH-2: Conduct, support, and facilitate Native Hawaiian cultural access and research of the NWHI over the life of the plan.	
Activity NHCH-2.1: Continue to compile information and conduct new cultural and historical research about the NWHI.	OHA
Activity NHCH-2.2: Support Native Hawaiian cultural research needs.	NOAA OHA State of Hawai‘i FWS
Activity NHCH-2.3: Facilitate cultural field research and cultural education opportunities annually.	NOAA OHA
Activity NHCH-2.4: Convene a Native Hawaiian nomenclature working group.	OHA
Activity NHCH-2.5: Incorporate cultural resources information into the Monument Information Management System.	NOAA
Activity NHCH-2.6: Continue to facilitate Native Hawaiian cultural access.	OHA
Activity NHCH-2.7: Establish agreements with local universities and museums to address possible curation, research, use, return, and repatriation of collections.	FWS
Strategy NHCH-3: Increase cultural resource management capacity across MMB agencies over the life of the plan.	
Activity NHCH-3.1: Assess Monument cultural resource capacity.	OHA
Activity NHCH-3.2: Engage Native Hawaiian practitioners and cultural experts and the Native Hawaiian Cultural Working Group in the development and implementation of the Monument’s management activities.	OHA
Activity NHCH-3.3: Increase knowledge base of Native Hawaiian values and cultural information through “in-reach” programs for resource managers.	OHA NOAA
Activity NHCH-3.4: Identify and integrate Native Hawaiian traditional knowledge and management concepts into Monument management.	OHA
Strategy NHCH-4: Plan, develop, and implement a Monument Cultural Resources Program over the life of the plan.	
Activity NHCH-4.1: Prepare a Cultural Resources Program Plan.	FWS
Activity NHCH-4.2: Develop and implement specific preservation and access plans, as appropriate, to protect cultural sites at Nihoa and Mokumanamana.	FWS
Activity NHCH-4.3: Initiate implementation of the Monument Cultural Resources Program.	FWS

Strategies and Activities	Agency Lead
Strategy NHCH-5: Provide cultural outreach and educational opportunities to serve the Native Hawaiian community and the general public over the life of the plan.	
Activity NHCH-5.1: Integrate Native Hawaiian values and cultural information into general outreach and education programs.	NOAA
Activity NHCH-5.2: Develop a culturally based strategy for education and outreach within the Native Hawaiian community.	NOAA
Activity NHCH-5.3: Integrate Native Hawaiian values and cultural information into the Monument permittee education and outreach program.	OHA

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3.1.3 Historic Resources Action Plan

Desired Outcome

Identify, document, preserve, protect, stabilize, and where appropriate, reuse, recover, and interpret historic resources associated with Midway Atoll and other historic resources within Papahānaumokuākea Marine National Monument.

Links to other Action Plans	
3.1.2	Native Hawaiian Culture and History
3.1.4	Maritime Heritage
3.6.3	Coordinated Field Operations

Current Status and Background

NOAA and FWS comply with the Federal Archaeological Program, a collection of laws and regulations that pertain to the protection of historical and archaeological properties on federal and federally managed lands. The National Historic Preservation Act directs all federal agencies to develop programs to protect historical and archaeological resources. Section 106 requires agencies to consider the potential impacts of their actions. Section 110 requires agencies to actively search for archaeological resources and to assess them for their significance and eligibility for inclusion in the National Register of Historic Places. The locations of cultural and historic resources are considered sensitive data and are not openly released even through the Freedom of Information Act. State agencies comply with similar state laws for protection of historic and cultural resources.

Links to goals
Goal 5
Goal 7
Goal 8

For the purposes of the Monument Management Plan, historic resources are the non-marine sites, structures, artifacts, in the Monument associated with the historic period (after first Western contact with Native Hawaiians in 1778). Historic resources in the Monument fall into two broad categories: Midway Atoll historic period resources, and those elsewhere in the Monument.

At Midway Atoll, historic period cultural resources include 63 structures and buildings eligible for inclusion in the National Register of Historic Places. These historic properties are mostly associated with World War II, the Battle of Midway National Historic Landmark and Memorial, and the early 20th-century Commercial Pacific Cable Company. Section 1.3 describes the history and context of the historic properties that remain on Midway Atoll. FWS currently manages the historic properties at Midway Atoll according to a Programmatic Agreement (Programmatic Agreement 1996) and Historic Preservation Plan (Speulda et al. 1999).

Jurisdiction and control of Midway Atoll were transferred from the Navy to the FWS in 1996 by Executive Order 13022. In preparation for the transfer, the Navy identified, evaluated, and mitigated effects on the 63 historic properties. The Navy conducted this effort in consultation with the Pacific Division of the Naval Facilities Engineering Command, FWS, Advisory Council on Historic Preservation, National Park Service, State Historic Preservation Officer of the State of Hawai‘i, Sixth Defense Battalion of the U.S. Marine Corps, Defenders of Midway Islands Reunion Association, and International Midway Memorial Foundation. The consultation resulted in a Programmatic Agreement for the treatment of the 63 historic properties (Programmatic Agreement 1996). One of the stipulations in the Programmatic Agreement directed the FWS to prepare a Historic Preservation Plan for long-term management of the 63 historic properties. FWS completed the plan in 1999 (Speulda et al. 1999).

The Midway Atoll Historic Preservation Plan focuses on long-term management and treatment for each of the 63 historic properties. It also identifies procedures for treating new discoveries and caring for museum collections, and includes recommendations for interpretation, education, and public outreach.

The Programmatic Agreement and Historic Preservation Plan prescribe one of six different treatment categories to each of the 63 historic properties. The treatment categories are (1) reuse, (2) secure, (3) leave as-is, (4) fill in, (5) demolish, or (6) relocate. Many factors were used to assign the treatment category for a historic property, including historic importance, interpretive value, overall setting, association with key historic themes, and structural integrity. The determinations were made in consideration of recommendations from interest groups, specialists, and the Advisory Council on Historic Preservation.

In the treatment category assignments, 23 buildings and structures were identified for reuse, including the Officers' housing; carpentry, machine, and transportation shop buildings; the refrigeration plant; the recreation facility; the seaplane hangar and ramp; and water reservoirs. Thirteen buildings were slated for securing and stabilization in place, including the command post, radar buildings, power plant, and the cable station buildings. Twenty structures were placed in the "leave as-is" category and will deteriorate in place under natural environmental conditions. These properties include the Eastern Island gun, runways, and revetments, and the Sand Island cemetery, Japanese gravestones, two 5-inch guns, and gun batteries. Four properties were filled with sand, including a pillbox and an underground bunker. Fifteen properties were slated for demolition, including the N.O.B. armory, the submarine base buildings, the general storehouse and air terminal building, two barracks, and the blackout hangar and associated shops. Three objects were identified for removal to a secure location, including a torpedo, a pillbox turret, and submarine netting.

Beyond the abundant, significant, and dramatic historic resources at Midway Atoll, few other significant historic resources within the Monument are presently known. As outlined in Section 1.3, the post-contact history of the Monument archipelago beyond Midway is rich and varied. However, the present record of tangible non-marine sites that relate to this history is small. This is because historians and archaeologists simply have not spent much time researching locations on the islands and atolls of the Monument for evidence of post-contact historical events such as shipwreck survivor camps, bird and other resource extraction camps, or World War II facilities.

Need for Action

Although the Midway Atoll Programmatic Agreement and Historic Preservation Plan are still in force, they need to be updated. Since the time the plan was written, in 1999, a visitor services plan has been adopted, lead-based paint abatement has become an important priority, and the Monument has been created. Furthermore, the Sixth Defense Battalion of the U.S. Marine Corps and Defenders of Midway Islands Reunion Association and the International Midway Memorial Foundation continue to maintain strong interest in the preservation and interpretation of historic resources at Midway Atoll. The historic properties require continual repair and maintenance according to the terms of the Historic Preservation Plan and the Secretary of the Interior's Standards for the Treatment of Historic Properties. The effects of weathering and erosion by salt water, salt spray, salty soils, precipitation, plant growth, solar radiation, and wind continue to threaten the integrity of the historic properties at Midway Atoll.

Among the islands that compose the Monument beyond Midway Atoll, surveys are needed to identify and evaluate historic resources that relate to shipwreck survivor camps, bird and other resource extraction camps, and World War II facilities. Beyond the historic resources of Midway Atoll, the other atolls and islands of the Monument have histories and associated historic resources that relate to the post-contact history of exploration, commerce, war, and conservation of the Monument.

Strategies to Achieve the Desired Outcome

The strategies and associated activities in this action plan constitute a historic resource program of identification, documentation, protection, preservation, reuse, and interpretation of the varied historic resources in the Monument. The Monument Management Plan calls for the implementation of a range of activities that preserve, stabilize, reuse, rehabilitate, and interpret the historic structures and the stories and artifacts associated with them.

Seven strategies have been developed for achieving the desired outcome of identifying, interpreting, and protecting historic resources in the NWHI. The strategies and activities are coded by the acronym for the action plan title, “Historic Resources” (HR). A summary of strategies and activities is provided in Table 3.1.3 at the end of this action plan.

- HR-1: Update the Midway Atoll Historic Preservation Plan to meet the present needs of the Refuge and Monument within one year.
- HR-2: Implement, supervise, and monitor the historic preservation treatments identified in the Midway Atoll Historic Preservation Plan at two historic properties each year.
- HR-3: Prepare an updated Battle of Midway National Historic Landmark nomination within four years.
- HR-4: Improve the function and capacity of the Midway museum within eight years.
- HR-5: Document and inventory historic resources beyond Midway Atoll NWR within 15 years.
- HR-6: Conduct archaeological and historical research on the historical events and structures at Midway Atoll NWR within 15 years.

Strategy HR-1: Update the Midway Atoll Historic Preservation Plan to meet the present needs of the Refuge and Monument within one year.

The Midway Historic Preservation Plan was written in 1999. Since then, a visitor services plan has been adopted, lead-based paint abatement has become an important priority, and the Monument has been designated. The historic properties require continuous repair and maintenance according to the terms of the Historic Preservation Plan and the Secretary of the Interior’s Standards for the Treatment of Historic Properties. The effects of weathering and erosion by salt water, salt spray, salty soils, precipitation, plant growth, solar radiation, and wind continue to threaten the integrity of the historic properties at Midway Atoll NWR. Within one year of Monument Management Plan approval, the Monument partners will update the Historic Preservation Plan and reconcile it with the existing Midway Visitor Services Plan and the lead-based paint removal plan.

Activity HR-1.1: Reconcile the Historic Preservation Plan with the Midway Visitor Service Plan, lead-based paint abatement plan, and other facilities maintenance and use plans.

This activity will require consultation and coordination among refuge program specialists and the MMB to align priorities and needs among these plans. The needs of the Historic Preservation Plan will be balanced with the priorities of lead-based paint removal, visitor services, habitat management, and management infrastructure.

Activity HR-1.2: Submit the updated Historic Preservation Plan for approval to the Advisory Council on Historic Preservation and Monument partners.

The updated Historic Preservation Plan may lead to the preparation of additional documents to support its implementation.

Strategy HR-2: Implement, supervise, and monitor the historic preservation treatments identified in the Midway Atoll Historic Preservation Plan at two historic properties each year.

The Midway Atoll Historic Preservation Plan (Speulda et al. 1999) and its enabling authorities (National Historic Preservation Act of 1966 and the Programmatic Agreement for Treatment of Historic Properties at Midway) have prescribed specific historic preservation treatments for the 63 historic properties at Midway Atoll NWR. Implementing this prescription requires a program that identifies needs and procedures and supervises the conduct of preservation treatments at the properties. This strategy will be coordinated with the facilities operation plan and the lead-based paint abatement priorities. An important activity in this strategy is to adaptively reuse historic buildings and structures at Midway Atoll NWR. Many of Midway's historic properties can serve the need for administrative and public space as Monument activities grow.

Activity HR-2.1: Within three years, create dedicated capacity to implement the updated Historic Preservation Plan.

Limited staff and funds currently exist at the Midway Atoll NWR or among the Monument management agencies for historic preservation and cultural and historic resources management. Agencies will identify staff needs and work toward building staff capacity to carry out the strategies and activities contained within this and related action plans. Staffing needs will be identified and included in the development of the Monument Cultural Resources Program plan (see Section 3.1.2, the Native Hawaiian Culture and History Action Plan).

Activity HR-2.2: Annually train Monument staff and the Midway contractors on the content of the Historic Preservation Plan and implementation of appropriate treatments.

All Midway personnel who are involved in maintaining Midway Atoll infrastructure need to be aware of the historic preservation responsibilities and procedures on the atoll. This will ensure that the use and maintenance of the historic properties occurs according to the treatment identified in the Historic Preservation Plan. Training media will be produced so that all new and visiting personnel and all regular permanent personnel stay current on historic preservation priorities on an annual basis.

Activity HR-2.3: Incorporate into the Midway Atoll visitor services program semiannual opportunities and events for visitors or volunteers to implement historic preservation treatments.

This activity will resurrect and refine the previous refuge program to recruit volunteers to help maintain historic properties, including painting, window restoration, and landscape maintenance.

Strategy HR-3: HR-3: Prepare an updated Battle of Midway National Historic Landmark nomination within four years.

The American victory at the Battle of Midway changed the course of World War II in the Pacific. The Battle of Midway National Historic Landmark was created in 1986 to honor this great achievement and the sacrifices of those involved. The National Historic Landmark focuses on the remains of nine defensive positions on Midway's Sand Island that are directly associated with this historic battle. These include six magazines, a pillbox, a 3-inch gun emplacement at Battery D, and 5-inch gun emplacements at Battery C. We now have a better understanding of historic features at Midway that played an important role in the battle. As a result, it is appropriate to update this important ensemble of National Historic Landmark features. Additional structures to consider for inclusion in the National Historic Landmark include Battery A, which had not been located when the National Historic Landmark was drafted; the underground bunker on south beach; and the south beach pillbox (S-6). The Eastern Island runways will also be considered for inclusion in the National Historic Landmark.

Activity HR-3.1: Identify, collect, and review publications, data sets, and documents on the National Historic Landmark within two years of Monument Management Plan adoption.

Archival research is the first step to identify resources that may be appropriate to include in the National Historic Landmark.

Activity HR-3.2: Plan and conduct a field survey and documentation of selected National Historic Landmark sites and features within two years.

Standard historical archaeological practice will be exercised in this activity.

Activity HR-3.3: Consult with interested parties and update the National Historic Landmark nomination within four years.

This activity includes evaluation of the findings, preparation of a report, an updated National Historic Landmark nomination, and consultation with the Advisory Council on Historic Preservation, the National Park Service National Historic Landmark staff, the Hawai'i State Historic Preservation Office, and interested and knowledgeable parties such as the Sixth Defense Battalion of the U.S. Marine Corps and Defenders of Midway Islands Reunion Association, and the International Midway Memorial Foundation.

Activity HR-3.4: Implement repair and maintenance treatments at National Historic Landmark features within six years.

The National Historic Landmark features require periodic repair and maintenance. Depending on the treatment, some of the repair and maintenance can be accomplished by volunteers or other unskilled labor, while other repair work will require the involvement of specially trained historic preservation architects and engineers.

Strategy HR-4: Improve the function and capacity of the Midway museum within eight years.

The Midway museum should be a general repository containing written material, photographs, artifacts, oral histories, and personal memorabilia relating to Midway's history. The museum should include a climate-controlled storage area, as well as research desks and tape recording and listening booths. The Midway museum should be a unique repository for records and materials useful for interpreting the history and natural history of Midway Atoll.

Activity HR-4.1: Prepare a Scope of Collections Statement within five years.

The Scope of Collections Statement document will help define the scope and types of documents, artifacts, and other historic materials that may be donated, or otherwise acquired by Monument staff for proper museum curation.

Activity HR-4.2: Remodel the Midway museum space within seven years.

This activity will remodel the Midway museum space to meet the needs of the Scope of Collections Statement and the visiting public and to preserve the artifacts and historical materials according to the museum curation standards set forth by the U.S. Department of the Interior Manual 411 DM (U.S. Department of the Interior 1997).

Activity HR-4.3: Organize and curate collections within eight years.

Organize and curate Midway Museum collections according to the museum curation standards set forth by the DOI (411 DM).

Strategy HR-5: Document and inventory historic resources beyond Midway Atoll NWR within 15 years.

Studying and protecting historic resources beyond Midway Atoll begins with basic documentary research and field site surveys. These activities are similar to those involved with ecosystem research. Both involve consolidation of past research and archival data and field inventory of non-marine areas within the Monument. Historic resource surveys are compatible with planned multitasking missions, interagency cooperation, and operational efficiency.

Activity HR-5.1: Identify, collect, and review publications, data sets, and documents within 12 years.

Archival research is the first step to identify historic resources that may occur on other islands and atolls in the archipelago beyond Midway.

Activity HR-5.2: Plan, conduct, and report on field surveys and documentation of selected sites within 15 years.

Standard historical archaeological practice will be exercised in this activity.

Strategy HR-6: Conduct archaeological and historical research on the historical events and structures at Midway Atoll NWR within 15 years.

Much has been written and documented about the history and historic properties at Midway Atoll, particularly with respect to its role in World War II. However, Midway's history is rich and varied. Many nontraditional perspectives and sources of information have yet to be investigated. A healthy and responsible historic preservation program at Midway will conduct new research.

Activity HR-6.1: Begin a long-term annual program to compile, collect, curate, and publish oral histories of life on Midway Atoll within 3 years.

From the Commercial Pacific Cable Station era to World War II and through the Cold War, many people have lived on or visited Midway Atoll. Their stories provide a perspective on Midway, commerce, and war that is rarely captured in standard histories and official documents. Some of these personal oral histories have been recorded; many others need to be collected. This activity will ensure that alternative perspectives on the unique history of Midway Atoll will not be lost to the passing of the ages.

Activity HR-6.2: Conduct archaeological investigation of the Commercial Pacific Cable Station site within ten years.

The Commercial Pacific Cable Station era was a unique chapter in the history of Midway Atoll. Archaeological and historical research, including excavation, will shed light on the lifestyle and struggles of Midway's earliest permanent residents.

Table 3.1.3 Summary of Strategies, Activities, and Agency Leads for Historic Resources

Strategies and Activities	Agency Lead
Strategy HR-1: Update the Midway Atoll Historic Preservation Plan to meet the present needs of the Refuge and Monument within one year.	
Activity HR-1.1: Reconcile the Historic Preservation Plan with the Midway Visitor Service Plan, lead-based paint abatement plan, and other facilities maintenance and use plans.	FWS
Activity HR-1.2: Submit the updated Historic Preservation Plan for approval to the Advisory Council on Historic Preservation and Monument partners.	FWS
Strategy HR-2: Implement, supervise, and monitor the historic preservation treatments identified in the Midway Atoll Historic Preservation Plan at two historic properties each year.	
Activity HR-2.1: Within three years, create dedicated capacity to implement the updated Historic Preservation Plan.	FWS
Activity HR-2.2: Annually train Monument staff and the Midway contractors on the content of the Historic Preservation Plan and implementation of appropriate treatments.	FWS
Activity HR-2.3: Incorporate into the Midway Atoll visitor services program semiannual opportunities and events for visitors or volunteers to implement historic preservation treatments.	FWS
Strategy HR-3: HR-3: Prepare an updated Battle of Midway National Historic Landmark nomination within four years.	
Activity HR-3.1: Identify, collect, and review publications, data sets, and documents on the National Historic Landmark within two years of Monument Management Plan adoption.	FWS
Activity HR-3.2: Plan and conduct a field survey and documentation of selected National Historic Landmark sites and features within two years.	FWS
Activity HR-3.3: Consult with interested parties and update the National Historic Landmark nomination within four years	FWS
Activity HR-3.4: Implement repair and maintenance treatments at National Historic Landmark features within six years.	FWS
Strategy HR-4: Improve the function and capacity of the Midway museum within eight years.	
Activity HR-4.1: Prepare a Scope of Collections Statement within five years.	FWS
Activity HR-4.2: Remodel the Midway museum space within seven years.	FWS
Activity HR-4.3: Organize and curate collections within eight years.	FWS
Strategy HR-5: Document and inventory historic resources beyond Midway Atoll NWR within 15 years.	
Activity HR-5.1: Identify, collect, and review publications, data sets, and documents within 12 years.	FWS
Activity HR-5.2: Plan, conduct, and report on field surveys and documentation of selected sites within 15 years.	FWS
Strategy HR-6: Conduct archaeological and historical research on the historical events and structures at Midway Atoll NWR within 15 years.	
Activity HR-6.1: Begin a long-term annual program to compile, collect, curate, and publish oral histories of life on Midway Atoll within three years.	FWS
Activity HR-6.2: Conduct archaeological investigation of the Commercial Pacific Cable Station site within ten years.	FWS

3.1.4 Maritime Heritage Action Plan

Desired Outcome

Identify, interpret, and protect maritime heritage resources in Papahānaumokuākea Marine National Monument.

Current Status and Background

The maritime heritage of the NWHI began hundreds, if not thousands, of years ago with Polynesian and Native Hawaiian voyages across the Hawaiian archipelago and beyond. This history, the lessons this history provides, and the need to further the understanding of this heritage are critical and are dealt with in other areas of this Monument Management Plan (see Section 3.1.2, the Native Hawaiian Culture and History Action Plan, and Section 3.5.3, the Native Hawaiian Community Involvement Action Plan).

Links to other Action Plans	
3.1.2	Native Hawaiian Culture and History
3.1.3	Historic Resources Action Plan
3.3.4	Emergency Response and Natural Resource Damage Assessment
3.4.1	Permitting
3.5.3	Native Hawaiian Community Involvement

Links to goals
Goal 3
Goal 4
Goal 5
Goal 7

A preliminary survey of the maritime heritage resource base began during the Northwestern Hawaiian Islands Reef Assessment and Monitoring Program research expedition in 2002 and continued in 2003, with annual surveys beginning in 2005. Initial investigations in the NWHI led to the discovery of the naval steamer USS *Saginaw*, wrecked in 1870, the submarine rescue vessel USS *Macaw*, lost in 1944, the sailing ship *Carrollton*, lost in 1906, and the whale ship *Parker*, lost in 1842. In 2004, NOAA divers located the remains of the British whaling ships *Pearl* and *Hermes*, lost in 1822. These two archaeological sites provide a unique material record of historic activities, being the oldest wrecks yet found in the Hawaiian Islands and the only known whalers of the British South Seas Company in the world. Annual surveys provide for continued documentation and discovery of new maritime heritage sites. Applying heritage practices to maritime resources challenges society to value what has only too often been considered out of sight and out of mind.

Best practices in the maritime heritage field, at both the national and international levels, highlight similarities between heritage preservation and natural resources conservation. These best practices aim to value maritime heritage resources in a manner that complements, rather than conflicts with, ecosystem management. While excavation may be appropriate in certain circumstances, in situ management is considered the first or preferred alternative in the overall research design. In situ management does not preclude recovery, but does set forth a “precautionary” approach in terms of the artifacts and their environment. Proposed heritage work in the NWHI region emphasizes a low-impact approach, to an extent consistent with the Monument’s conservation goals and guiding principles. The coordinated management of heritage and natural resources is achieved through a unified permitting process.

Need for Action

For the purposes of this Monument Management Plan, the definition of maritime heritage resources includes submerged and beached shipwrecks, aircraft, and other sites of historical, cultural, and archaeological significance. These resources have not been adequately inventoried or protected within the NWHI. The main Hawaiian Islands have experienced the illegal removal of historic artifacts, as well as the potential destruction of historic material from nearshore

construction and dredging projects. By comparison, NWHI maritime heritage resources are relatively intact and undisturbed. NOAA, the State of Hawai‘i, and FWS have the statutory responsibility to inventory, evaluate, and interpret these heritage resources, and together increase maritime heritage preservation in the Monument and awareness of these unique resources throughout the State.

NOAA, the State of Hawai‘i, and FWS share similar goals of heritage resource preservation in the Monument. Protection and management of sites that meet established heritage criteria are mandated by state and federal preservation laws.

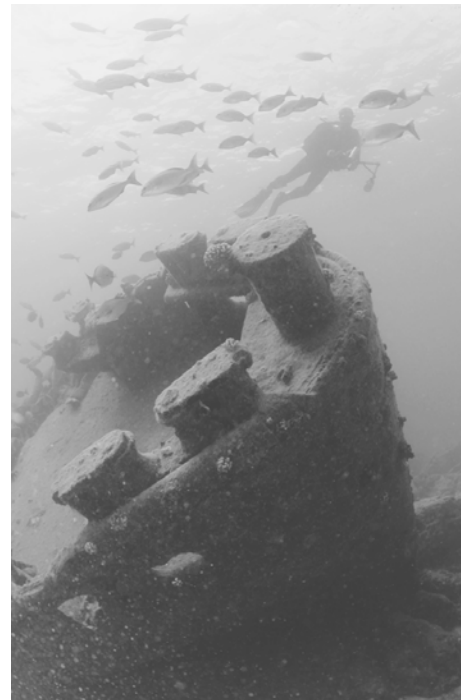
Maritime heritage resources, when properly studied and interpreted, add an important dimension to our understanding and appreciation of our nation’s rich maritime legacy, and make us more aware of the critical need to be wise stewards of our ocean planet.

NOAA and FWS comply with the Federal Archaeological Program, a collection of laws and regulations that pertain to the protection of historical and archaeological properties on federal and federally managed lands. The National Historic Preservation Act directs all federal agencies to develop programs to protect historical and archaeological resources. Section 106 requires agencies to consider the potential impacts of their actions, including the review of permit applications for projects that may allow the disturbance of the seabed, where archaeological remains may lie. Section 110 requires agencies to actively search for archaeological resources and to assess them for their significance and eligibility for inclusion in the National Register of Historic Places. This action plan presents strategies and activities for addressing maritime

heritage resource management and protection needs in the Monument. To this end, each program or agency may contribute its own particular expertise: the Maritime Heritage Program, under NOAA’s Office of National Marine Sanctuaries (ONMS), features field survey skills in underwater archaeology; FWS manages its comprehensive cultural resources program; and the State of Hawai‘i Department of Land and Natural Resources provides the context of the state inventory.

Strategies to Achieve the Desired Outcome

The strategies and associated activities in this action plan are designed to increase our understanding of maritime heritage resources and foster effective and protective management in the Monument. These strategies will be carried out in collaboration with maritime heritage staff of ONMS, Pacific Islands Region; the Historic Preservation Division of the State Department of Land and Natural Resources; and the FWS Cultural Resources Team.



NOAA diver surveys the USS *Macaw* remains off Midway Atoll . Photo: James Watt

Three strategies have been developed for achieving the desired outcome of identifying, interpreting, and protecting maritime heritage resources in the NWHI. The strategies and activities are coded by the acronym for the action plan title, “Maritime Heritage” (MH). A summary of strategies and activities is provided in Table 3.1.4 at the end of this action plan.

- MH-1: Document and inventory maritime heritage resources throughout the life of the plan.
- MH-2: Incorporate maritime heritage into public education and outreach throughout the life of the plan.
- MH-3: Coordinate interagency efforts to protect maritime heritage resources for the life of the plan.

Strategy MH-1: Document and inventory maritime heritage resources throughout the life of the plan.

Studying and protecting maritime heritage resources begin with basic documentary research and field site surveys. These activities are similar to those involved with ecosystem research. Both involve consolidation of past research and archival data, scientific SCUBA diving operations, and bathymetric mapping and remote sensing surveys. Maritime heritage surveys are compatible with planned multitasking missions, interagency cooperation, and operational efficiency.

Activity MH-1.1: Identify, collect, and review publications, data sets, and documents annually.

Archival research and review of existing documents are the first steps in creating and confirming the maritime heritage resource inventory in the NWHI, as well as in formulating an effective field survey plan. Documents from at least two maritime heritage sites will be added to the site database per year.

Activity MH-1.2: Plan and carry out coordinated field mapping surveys of selected sites annually.

Conducting field mapping surveys is the next step in understanding and interpreting heritage sites. Techniques can include shoreline terrestrial survey and inventory; marine remote sensing using magnetometer and side-scan sonar to locate potential heritage targets; and noninvasive diving surveys to assess and inventory sites (Dean 1992). These phases generally take place during multidisciplinary research cruises and are the result of coordinated interagency planning. Results are incorporated into a comprehensive Monument maritime heritage resource inventory maintained by ONMS. As an ongoing annual activity, maritime heritage field surveys will be conducted and progress reports will be completed annually.

Activity MH-1.3: Complete a status report on potential environmental hazards within 1 year, and update it annually.

Wreck sites and other debris can represent potential environmental hazards that may be identified through field survey work. The MMB will be informed of any discovered potential hazards in order to assess the need for response or remediation (see Section 3.3.4, Emergency Response and Natural Resource Damage Assessment Action Plan). A status report on potential environmental hazards from wreck sites, disposal, etc. will be compiled by year 1 and updated annually.

Activity MH-1.4: Develop status report on maritime heritage artifact recovery operations within two years, and recover and conserve maritime heritage artifacts as appropriate.

When excavation and analysis of material remains are appropriate for site interpretation, and when these tasks can be done in a manner that respects the integrity of the ecosystem and the environmental goals of the Monument, recovery of selected artifacts is a way of bringing the data to the public, rather than taking more visitors to the NWHI site. Such recovery will be carried out through the established permitting processes of the Monument (see Section 3.4.1, Permitting Action Plan, and Appendix A). A status report on potential and completed maritime heritage recovery operations will be completed by year 2 and updated annually.

Activity MH-1.5: Develop and implement an internal maritime heritage resource database within 5 years.

An internal database of known maritime heritage resources will be established and maintained by the Monument maritime archaeologist for the prioritization of targets, to be completed by year 5.

Strategy MH-2: Incorporate maritime heritage into public education and outreach throughout the life of the plan.

Raising public awareness of the maritime heritage field is essential to better valuing and protecting the resource. Protection comes through understanding the nature of heritage resources and what we can learn from them, as well as familiarity with established preservation laws. Education and outreach efforts for maritime sites emphasize “bringing the place to the people, not the people to the place” in a responsible manner.

Activity MH-2.1: Incorporate maritime heritage materials into Monument education and outreach projects annually.

Resources and opportunities for collaboration for education and outreach are available through the MMB agencies and other entities. Monument maritime archaeologists will coordinate and participate in public outreach regarding Monument heritage resources and maritime history. Outreach efforts may include presentations, displays, still and video projects, and website materials. This activity includes potential support for the promotion of Native Hawaiian cultural outreach and education via Section 3.1.2, the Native Hawaiian Culture and History Action Plan.

Activity MH-2.2: Develop and deliver public maritime heritage educational materials at selected presentations, conferences, and events.

Shipwreck topics often appeal to large audiences at local, national, and international levels, and offer a chance to not only highlight the relatively new field of maritime heritage, but also to emphasize the unique nature of the NWHI, the need for conservation and ecosystem management, and the overall stewardship of all ocean resources. A minimum of two maritime heritage presentations will be given at professional conferences or public events each year.

Strategy MH-3: Coordinate interagency efforts to protect maritime heritage resources for the life of the plan.

Because of NOAA's previous maritime heritage work in the region, efforts to inventory, evaluate, interpret, and preserve maritime heritage resources in the NWHI will be coordinated by a staff maritime archaeologist through ONMS, and conducted in close collaboration and coordination with the MMB. Each program or agency provides expertise in related fields: maritime archaeology field survey (NOAA); museum program, terrestrial archaeology, and National Historic Preservation Act (NHPA) implementation (FWS); and state survey, inventory, and preservation (Department of Land and Natural Resources).

Activity MH-3.1: Coordinate interagency maritime heritage resources management annually.

Communication by the MMB with heritage preservation efforts on a larger scale is essential. Communication involves sharing research and preservation efforts in the Monument with the related professional fields of archaeology and cultural resource management, among others. Coordination of field activities is also necessary for the more effective use of facilities and equipment. Efforts to collaborate and coordinate will occur annually for the duration of the plan.

Activity MH-3.2: Enhance protective measures for selected sites within the NWHI through the National Register nomination process within 2 years.

Protection of specific heritage sites will be enhanced by federal recognition under the National Heritage Preservation Act and the National Register of Historic Places (Delgado 1985). Additionally, preservation measures of the Department of Land and Natural Resources will be implemented for resources on state submerged lands (up to 3 nautical miles from emergent lands) via the State Historic Preservation Division. Protective status for specific sites will be sought as needed using measures described above. This activity includes potential support for the protection and preservation of Native Hawaiian cultural resources discussed in the Native Hawaiian Culture and History Action Plan (Section 3.1.2). The National Register nomination process for maritime heritage sites will begin by year 2.

Activity MH-3.3: Develop and implement a Monument Maritime Heritage Research Plan within 2 years.

The Monument Maritime Heritage Resource Research Plan will be completed within 2 years. Working collaboratively with partner and local agencies, universities, and experts in the field, the MMB will develop a research plan that outlines maritime heritage priorities for the NWHI. This effort will be coordinated by the Monument maritime archaeologist.

Table 3.1.4 Summary of Strategies, Activities, and Agency Leads for Maritime Heritage

Strategies and Activities	Agency Lead
Strategy MH-1: Document and inventory maritime heritage resources throughout the life of the plan.	
Activity MH-1.1: Identify, collect, and review publications, data sets, and documents annually.	NOAA
Activity MH-1.2: Plan and carry out coordinated field mapping surveys of selected sites annually.	NOAA
Activity MH-1.3: Complete a status report on potential environmental hazards within one year, and update it annually.	NOAA
Activity MH-1.4: Develop status report on maritime heritage artifact recovery operations within 2 years, and recover and conserve maritime heritage artifacts as appropriate.	NOAA
Activity MH-1.5: Develop and implement an internal maritime heritage resource database within 5 years.	NOAA
Strategy MH-2: Incorporate maritime heritage into public education and outreach throughout the life of the plan.	
Activity MH-2.1: Incorporate maritime heritage materials into Monument education and outreach projects annually.	NOAA
Activity MH-2.2: Develop and deliver public maritime heritage educational materials at selected presentations, conferences, and events.	NOAA
Strategy MH-3: Coordinate interagency efforts to protect maritime heritage resources for the life of the plan.	
Activity MH-3.1: Coordinate interagency maritime heritage resources management annually.	NOAA
Activity MH-3.2: Enhance protective measures for selected sites within the NWHI through the National Register nomination process within 2 years.	NOAA
Activity MH-3.3: Develop and implement a Monument Maritime Heritage Research Plan within 2 years.	NOAA

3.2 Conserving Wildlife and Habitats

3.2.1 Threatened and Endangered Species Action Plan

3.2.2 Migratory Birds Action Plan

3.2.3 Habitat Management and Conservation Action Plan

3.2 Conserving Wildlife and Habitats

Coastal development in the main Hawaiian Islands has resulted in the destruction of natural habitats for many protected species, giving rise to the NWHI's function as a wildlife haven relatively undisturbed by human presence. A significant number of species found in the NWHI are at risk of extinction and depend upon the unique habitat found there for their survival. Ninety percent of the Hawaiian population of green turtles nests in the NWHI, and the majority of Hawaiian monk seals pup there. The NWHI also host one of the largest and most important assemblages of seabirds in the world.

Past human activities in the NWHI have left lasting habitat impacts in the form of sunken and grounded vessels, dilapidated buildings and structures, military sites, and introduced species that have become invasive. The remnants of these activities can sometimes pose a threat to wildlife and their natural habitat. Other impacts resulting from climate change pose significant threats to NWHI habitats and endangered species. To address these impacts, the FWS maintains a full-time presence at French Frigate Shoals, Laysan Island, and Midway Atoll to monitor wildlife, eliminate noxious weeds, restore native vegetation, prevent the extinction of native species, and clean up contaminated sites. NOAA maintains seasonal field camps at several islands to monitor Hawaiian monk seal populations and works with FWS at seasonal field camps at French Frigate Shoals. The State also maintains a part-time presence at Kure Atoll to undertake similar activities.

Action plans to take care of threatened and endangered species, migratory birds, and the habitats upon which they depend focus on undertaking on-the-ground conservation and management strategies. These strategies and activities focus on population enhancement through the maintenance and improvement of key ecosystem components. Many of the strategies and activities reflect information contained in the Hawai'i Comprehensive Wildlife Conservation Strategy developed by the Hawai'i Department of Land and Natural Resources (Mitchell et al. 2005) and were considered in the development of the Monument Management Plan.

Each action plan consists of a set of strategies to address a desired outcome. Over the next 15 years, these desired outcomes are:

- **Threatened and Endangered Species:** Safeguard and recover threatened and endangered plants and animals and other protected species within Papahānaumokuākea Marine National Monument.
- **Migratory Birds:** Conserve migratory bird populations and habitats within Papahānaumokuākea Marine National Monument.
- **Habitat Management and Conservation:** Protect, maintain, and where appropriate, restore the native ecosystems and biological diversity of Papahānaumokuākea Marine National Monument.

Action plans described in this section will be implemented in close coordination with agency partners and in conjunction with other priority management needs.

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3.2.1 Threatened and Endangered Species Action Plan

Desired Outcome

Safeguard and recover threatened and endangered plants and animals and other protected species within Papahānaumokuākea Marine National Monument.

Current Status and Background

Two federal acts, as well as multiple state statutes, protect specific species in the NWHI. The federal acts are the Endangered Species Act of 1973 (ESA) and the Marine Mammal Protection Act of 1972 (MMPA). The ESA provides for the conservation of species at risk of extinction throughout all or a significant portion of their range and the protection of critical habitats on which they depend. The ESA also gives individual states the option to assist in managing endangered species recovery programs. The MMPA provides for the protection and conservation of all marine mammals and their ecosystems, whether or not they are listed under the ESA. Because of the overlap of protections, this action plan’s activities are directed at both ESA listed and non-ESA listed marine mammals. The State of Hawai‘i has additional protections for endangered species in its wildlife laws, which also affords other indigenous species treatment as threatened or endangered if criteria are met (HRS 195D, HRS 183D, HRS 125, and Hawai‘i Administrative Rules Title 13). The recovery plans issued pursuant to the ESA guide conservation efforts of threatened and endangered species. The most recent iterations of these plans were used to guide the strategies and activities under this action plan. Specific recovery activities for listed species are included in recovery plans, which may be accessed at: <http://www.nmfs.noaa.gov/pr/recovery/plans.htm> and <http://www.fws.gov/endangered/recovery/index.html#plans>. In addition, many of the strategies and activities are informed by Hawaii’s Comprehensive Wildlife Conservation Strategy (Mitchell et al. 2005).

Links to other Action Plans	
3.2.3	Habitat Management and Conservation
3.3.1	Marine Debris
3.3.2	Alien Species
3.4.1	Permitting Action Plan
3.5.1	Agency Coordination
3.5.4	Ocean Ecosystems Literacy
3.6.3	Coordinated Field Operations

Links to goals
Goal 1
Goal 3
Goal 4

Hawaiian Monk Seal: The Hawaiian monk seal is in crisis. The population is in a decline that has lasted 20 years, and as of 2008, there were about 1,200 monk seals. Modeling predicts that the species’ population will fall below 1,000 animals by the year 2012. Actions to date have not been sufficient to result in a recovering population. Most of the entire world population of Hawaiian monk seals breeds and forages inside the Monument. The recovery plan for the Hawaiian monk seal (NMFS 2007) provides a detailed description of actions that should be taken by NMFS and its collaborators to recover the species. This action plan details the ways the MMB can facilitate and support those efforts.

Cetaceans: In the NWHI, sighting and acoustic recordings of baleen whales as well as toothed whales and dolphins have been documented. Five species of baleen whales listed as “endangered” under the ESA and HRS 195D, and as “depleted” under the MMPA have been sighted or heard in the Monument area. In addition to these five, the endangered sperm whale and at least 18 other non-ESA listed species are found in the Monument (Barlow 2006). It has now been documented that groups of humpback whales are overwintering in the waters of the Monument, including whales with small calves and some that exhibit breeding behavior

(Johnston et al. 2007). Recovery actions for this listed species are summarized in the final recovery plan for the humpback whale, *Megaptera novaeangliae* (NMFS 1991). Draft recovery plans are available for the fin whale and sperm whale (NMFS 2006a, 2006b), and a final recovery plan is available for the blue whale (NMFS 1998).

Marine Turtles: Marine turtles that are known to occur in the Monument are the Hawaiian population of the green turtle and hawksbill, loggerhead, and leatherback turtles. While there are no records of the threatened olive ridley within Monument waters, their wide distribution throughout the tropical Pacific makes it likely that they do sometimes occur there. Green and loggerhead sea turtles are listed as threatened species; the hawksbill and leatherback turtles are listed as endangered species. Recovery plans are in place for each of these species in the Pacific and 5-year reviews were jointly published in 2007 (NMFS and FWS 1998a; 1998b; 1998c; 1998d; 1998e, 2007). Sea turtle population declines have occurred across the Pacific because of nesting habitat loss, harvesting of eggs and turtles for commercial and subsistence purposes, and fishery interactions. About 90 percent of nesting activity for the Hawaiian population of green turtles occurs in the NWHI at islets of French Frigate Shoals (Balazs and Chaloupka 2004a).

Birds: Five endangered bird species in the NWHI are afforded protection under the ESA and HRS 195D. Three species are passerines: the Laysan finch, found on Laysan Island and Pearl and Hermes Atoll, and the Nihoa finch and the Nihoa millerbird, which are endemic to Nihoa. Research, recovery, and management of these species take into consideration the recommendations of the Northwestern Hawaiian Islands Passerines Recovery Plan (FWS 1984), Hawaii's Comprehensive Wildlife Conservation Strategy for the Northwestern Hawaiian Islands (Mitchell et al. 2005) and ongoing input from species experts. Numerous sites were evaluated and ranked for translocation of these species to establish additional populations; this information and some recommendations for proceeding with translocation were provided recently by Morin and Conant (2007).

The Laysan duck has the most restricted range of any duck species and is especially vulnerable to extinction because of its small population size (fewer than 800 individuals) and extremely limited range. In 2004 and 2005, a total of 42 Laysan ducks were translocated to Midway Atoll NWR. Not all of these birds have reproduced, but the newly established population has grown since 2005 from 42 to a preliminary estimate of 192 birds in 2007 (Reynolds and Citta 2007). Additional activities are described in the Draft Revised Recovery Plan for the Laysan Duck (*Anas laysanensis*) (FWS 2004).

The short-tailed albatross breeds on Torishima, an island owned and administered by Japan. The short-tailed albatross was first observed at Midway Atoll between 1936 and 1941. Since then, one to four individuals have been observed every year in the NWHI. The Short-tailed Albatross Draft Recovery Plan (FWS 2005) provides suggestions for ways in which Monument staff can facilitate recovery of this species.

Plants: Six plant species known historically from the NWHI are listed as endangered. Three plant taxa have probably always been rare and restricted to Nihoa, although one species, the loulu or fan palm, also occurred on Laysan Island. *Mariscus pennatiformis* ssp. *bryanii* is known only from Laysan Island. *Cenchrus agrimonioides* var. *laysanensis* was historically known from

Laysan Island and Midway and Kure Atolls, but has not been seen there since about 1980 (O'Connor 1999; HBMP database 2007). A recovery plan for three species found only at Nihoa (Nihoa fan palm, *Schiedea verticillata*, and *Amaranthus brownii*) was finalized in 1998 (FWS 1998). Recovery actions for the other three species (*Cenchrus agrimonioides*, *Mariscus pennatiformis*, and *Sesbania tomentosa* or 'ohai) are described in the Recovery Plan for the Multi-Island Plants (FWS 1999).

Need for Action

A coordinated and comprehensive approach is required to understand and address specific threats (e.g., climate change, habitat loss) in order to protect and recover these 23 endangered or threatened species. Cooperation among the MMB agencies is crucial to ensure that management actions conducted in the Monument are effective in protecting and enhancing populations of these endangered species and marine mammals because the entire world population of many of these species occurs only, or almost entirely, within the Monument.

Strategies to Achieve the Desired Outcome

The strategies and associated activities in this action plan are designed to increase populations of threatened and endangered species and foster effective and protective management in the Monument. These strategies will be carried out in collaboration with and coordination by the Co-Trustees and other entities. The proposed activities in this Action Plan are characterized by more urgency, and perhaps in some cases more controversy, than those in some of the other action plans. Extra consideration is needed during prioritization of activities and in permitting in light of the high cost of failure to act. A great effort to coordinate with key stakeholder groups and the Native Hawaiian community will ensure that all interests have been identified. In addition to these management strategies for threatened and endangered species, additional and more detailed research and monitoring activities will be incorporated into the Natural Resources Science Plan.

Eight strategies have been developed for achieving the desired outcome of protecting marine mammals and aiding in the recovery of threatened and endangered plants and animals in the Monument. The strategies and activities are coded by the acronym for the action plan title, "Threatened and Endangered Species" (TES). A summary of strategies and activities is provided in Table 3.2.1 at the end of this action plan.

- TES-1: Support activities that advance recovery of the Hawaiian monk seal for the life of the plan.
- TES-2: Determine the status of cetacean populations and verify and manage potential threats over the life of the plan.
- TES-3: Ensure that nesting populations of green turtles at source beaches are stable or increasing for the life of the plan.
- TES-4: Work with the international recovery team for short-tailed albatrosses to facilitate an increase in the total breeding population of this species to at least 25 breeding pairs occurring on sites other than Torishima and Senkaku islands for the life of the plan.
- TES-5: Conduct activities to increase Laysan duck populations in the Monument over the life of the plan.

- TES-6: Maintain stable or increasing populations of the Laysan finch, Nihoa finch, and Nihoa millerbird in the Monument over the life of the plan.
- TES-7: Establish populations of each listed plant species on one to three additional Monument islands and ensure genetic material is also protected in approved repositories for the life of the plan.
- TES-8: Ensure protection of threatened and endangered species by facilitating Endangered Species Act consultations for Monument activities throughout the life of the plan.

Strategy TES-1: Support activities that advance recovery of the Hawaiian monk seal for the life of the plan.

For nearly 3 decades, a concerted effort has been made to save the Hawaiian monk seal. The U.S. Government, the State of Hawai‘i, nongovernment organizations, private-sector entities, and countless individuals in local communities across Hawai‘i have worked to recover the species. These efforts have not been sufficient to prevent a continued decline in the species. However, without these efforts, the situation would likely be much worse.

As recommended by the 2007 Recovery Plan for the Hawaiian Monk Seal, several key actions are required to address current and potential threats to the monk seal in attempts to alter the trajectory of the Hawaiian monk seal population and to move the species toward recovery. The most critical activities described in the plan that are applicable to the monk seal population in the Monument are to (1) investigate food limitations and take actions to increase female juvenile survival, (2) prevent entanglement of seals in marine debris, (3) reduce shark predation on seals, (4) reduce exposure to and spread of infectious disease, (5) continue population monitoring and research, (6) reduce impacts from grounded vessels, (7) reduce the impact of human interactions, and (8) conserve monk seal habitat.

To advance efforts on these key actions to address threats to monk seal survival and recovery, the MMB will pursue several key strategies in support of monk seal recovery efforts. These efforts will advance the objective of reversing the population decline of monk seal populations in the Monument and achieving a positive growth rate during the life of this plan.

Activity TES-1.1: Support marine debris removal activities to promote recovery.

Hawaiian monk seals have one of the highest documented entanglement rates of any pinniped species, and marine debris, such as derelict fishing gear, are chronic forms of pollution affecting the NWHI. The incidence of entangled monk seals at the breeding sites of the NWHI has been well documented and field staff actively disentangle seals. Cetaceans, sea turtles, and sea birds are also subjected to the detrimental effects of derelict fishing gear and other marine debris. Monument staff will support efforts to reduce marine debris as detailed in the strategies and activities in the Marine Debris Action Plan. These efforts, particularly in key monk seal habitat, will decrease the number of injuries and mortalities caused by entanglement (see Section 3.3.1, Marine Debris Action Plan).

Activity TES-1.2: Support and facilitate emergency response for monk seals.

The ability to respond to situations in the Monument that threaten monk seals, such as ship groundings, oil spills, and disease outbreak, requires a well-coordinated interagency effort and is constrained by limited transportation and logistical capabilities. Several agencies have response protocols, but further coordination and collaboration among the agencies will help minimize the effects during these events. Agreed-upon and standardized protocols will be put into place to ensure that a rapid and well-organized response, including assessment, proper collection of evidence, and continued monitoring, occurs during and after an event. The Monument can facilitate these types of responses through coordination, permitting, and transportation and logistical support.

Activity TES-1.3: Conserve Hawaiian monk seal habitat.

Consideration should be given to evaluating the loss of habitat caused by erosion and other factors (e.g., sea level rise) that have contributed to the loss of critical habitat for seals. Predicted increases in sea level this century and beyond may severely reduce the amount of habitat for seals to rest, breed, and rear their pups. Feasibility of restoration will be evaluated to consider rebuilding habitat essential for the reproduction of monk seals and other protected species (e.g., turtles and sea birds) at several alternative sites that could lead to rebuilding preferred, stable pupping habitat (i.e., accessibility, long shoreline, and stable beach).

Activity TES-1.4: Reduce the likelihood and impact of human interactions on monk seals.

Efforts will be made to ensure that all users of the NWHI are aware of the impacts of disturbing monk seals on breeding beaches and in nearshore waters. Any proposed activity in the Monument that may increase seal disturbance or threaten survival (such as nearshore ship traffic, beach use, noise, research, or any other impact that could negatively affect the marine or terrestrial habitat of the monk seal) should be scrutinized carefully during the permit review process to ensure recovery of the monk seal population is not hampered by the activity.

Activity TES-1.5: Support outreach and education on Hawaiian monk seals.

Increased outreach and education activities focused on the Hawaiian monk seal are now being conducted. Continuation of these activities will provide the public and interest groups with information to understand the critical status of the Hawaiian monk seal population and the urgent action that is needed to prevent extinction.

Activity TES-1.6 Reduce shark predation on monk seals.

More than two decades of monk seal studies indicate that predation by Galapagos sharks on pre-weaned pups is an unusual behavior, occurring primarily at French Frigate Shoals. These sharks are known to kill and injure Hawaiian monk seals, and more needs to be understood about shark abundance, prey preferences, and seasonal movement patterns. The problem should continue to be monitored. Site-specific mitigation plans and methods should be developed and implemented, as appropriate.

Strategy TES-2: Determine the status of cetacean populations and verify and manage potential threats over the life of the plan.

Management actions and efforts to reduce the impacts to cetaceans in the NWHI have been limited, largely because of sparse information on the distribution, abundance, and ecology of

species using the Monument. Initial efforts should address this lack of information, which should then lead to the identification and management of threats.

Activity TES-2.1: Census cetacean populations.

In order to best develop management strategies for cetaceans in the Monument, surveys and observations will be pursued to gain information on species distribution and abundance estimates. This information will allow managers to better define humpback whale breeding and calving areas in the NWHI.

Activity TES-2.2: Conduct annual spinner dolphin mark and recapture photo identification surveys.

Annual spinner dolphin mark/recapture photo identification surveys will be continued at Midway, Kure, and Pearl and Hermes Atolls in order to maintain the only long-term data set (1998-2007) in the NWHI. The census may be expanded to other locales in the future.

Activity TES-2.3: Monitor, characterize, and address the effects of marine debris on cetaceans in the Monument.

Monument staff will reduce the potential for cetaceans to be adversely affected by marine debris. The long-term solution is ultimately a decrease in the amount of debris entering the ocean; strategies are included in Section 3.3.1, the Marine Debris Action Plan.

Activity TES-2.4: Respond to any suspected disease and unusual mortality incidents affecting cetaceans.

To date, no cases of a NWHI cetacean with an infectious disease have been documented. Should an ill cetacean be sighted, when feasible, the animal will be examined and sampled for a broad spectrum of possible diseases, treated appropriately, and monitored for recovery. Performing timely and complete necropsies with cetaceans will facilitate disease surveillance and monitoring in the NWHI. Contingency response plans will be developed to respond to disease outbreaks, mass strandings, and necessary human and material resources will be identified to initiate an appropriate response.

Activity TES-2.5: Prevent human interactions with cetaceans.

Efforts will be made to prevent negative human-cetacean interactions that may occur as a result of visitor programs or research activities through design controls on both. The controls will aim to prevent disturbance to cetaceans resting in Monument lagoons or nearshore areas and restrict geological research using sound levels known to be dangerous to marine mammals.

Strategy TES-3: Ensure that nesting populations of green turtles at source beaches are stable or increasing over the life of the plan.

The Hawaiian population of the green turtle is a discrete genetic stock of *Chelonia mydas* that is endemic to the Hawaiian Archipelago. This population of threatened green turtles has been monitored since the 1970s and is one of the few populations in the Pacific that is increasing in numbers. The principal rookery for the Hawaiian population of the green turtle is located on sand islands at French Frigate Shoals. More than 90 percent of all green turtle nesting in the Hawaiian Archipelago occurs here. The main rookery island at French Frigate Shoals is East

Island, where at least 50 percent of the nesting occurs, and approximately 200 to 500 females nest each year. Other atolls within the NWHI that support green turtle nesting include Laysan Island, Lisianski Island, and Pearl and Hermes Atoll. Individual nests have been documented for the first time at Midway Atoll in 2006 and 2007.

Green turtles were listed under the ESA in 1978 because of overexploitation for commercial and other purposes, the lack of adequate regulatory mechanisms and effective enforcement, evidence of declining numbers, and habitat loss and degradation. The protections of the ESA and HRS 195D have been effective at restoring Hawaiian green turtle population abundance, as evidenced by a long-term, steady increase in the number of nesting females at the principal green turtle rookery at French Frigate Shoals.

Activity TES-3.1: Collect biological information on nesting turtle populations.

Research has been conducted on the green turtle nesting population in the NWHI since 1973 and comprises one of the longest time series of nesting abundance data for any sea turtle population around the globe. Information on abundance of nesting turtles is critical for making intelligent management decisions, understanding the status of the Hawaiian population of the green turtle, and evaluating the success of management programs. Maintenance of standardized and consistent monitoring protocols is crucial to understanding population trends, leading to effective management (See Section 3.1.1, Marine Conservation Science Action Plan). In addition to maintaining current nesting monitoring at East Island, distribution of nesting activity throughout the Monument will be periodically reassessed. As the population increases, or nesting sites are degraded as a result of sea level rise, new sites may be used for nesting.

Activity TES-3.2: Protect and manage nesting and basking habitat.

Green turtle nesting habitat, including basking beaches, will be protected by use of best management practices to prevent the introduction of mammalian predators on eggs and hatchlings, reduce artificial lighting near nesting beaches, prohibit undesirable habitat alteration, and control human access. Limited entry policies will be continued, and human activities will be strictly regulated at islands and reefs used by green turtles.

Rises in sea level as a result of climate change are predicted to reduce the availability of green turtle nesting habitat at French Frigate Shoals, and changes in nest-site temperature regimes may affect population ecology by modifying sex ratios of hatchling populations. Management actions may need to be undertaken to delay habitat loss as a result of rising sea level. Awareness of these impacts will improve our ability to reduce impacts and manage habitat for sea turtle populations.

Activity TES-3.3: Protect and manage marine habitat, including foraging areas and migration routes.

Areas of high turtle foraging activity in the Monument will be identified and mapped, along with high-use corridors used by turtles migrating between their breeding sites and foraging areas outside the Monument. Activities in the Monument, such as anchoring and vessel transit, will be managed to minimize disturbance to foraging areas; reduce discharge and introduction of contaminants, silt, and oil; and minimize vessel hazards to turtles transiting the open water areas of the Monument.

Strategy TES-4: Work with the international recovery team for short-tailed albatrosses to facilitate an increase in the total breeding population of this species to at least 25 breeding pairs occurring on sites other than Torishima and Senkaku islands.

The short-tailed albatross was listed as federally endangered in the United States in 2000. The foraging range of the short-tailed albatross overlaps with that of the black-footed and Laysan albatrosses and covers most of the northwestern and northeastern Pacific Ocean. The short-tailed population dropped dramatically as a result of feather hunters in the late nineteenth century. The world population of short-tailed albatross is currently estimated at fewer than 2,000 birds, with 85 percent of individuals breeding at a single colony on Torishima Island in Japan, and the remaining individuals breeding on Senkaku Island, just southwest of Torishima.

Activity TES-4.1: Work cooperatively with the Japanese government to establish one or more breeding populations on islands free from threats such as active volcanoes and introduced mammals.

While most of the recovery actions for short-tailed albatrosses will necessarily be carried out by the Japanese government, activities such as providing use of surrogate species for development of translocation techniques and technical assistance will contribute to the recovery of this species. In 2006, ten Laysan albatross chicks from Midway Atoll were translocated to Kīlauea Point National Wildlife Refuge on Kaua‘i, where Japanese ornithologists raised them to learn appropriate nurturing techniques. With this knowledge, it may be possible to translocate short-tailed albatross from Torishima to safer habitats. FWS staff also help Japanese biologists with satellite tagging projects studying feeding patterns, how weather systems and winds influence short-tailed albatross movements, and how ocean productivity and seafloor bathymetry affect their distribution.

This activity also includes attempts to attract birds to Midway Atoll using decoys and recorded colony sounds and monitoring and maintaining any new breeding colony sites established at Midway Atoll. In recent years, one to four short-tailed albatross have been attracted to Midway, and two birds were practicing their mating dance on Eastern Island at Midway in 2008.

Activity TES-4.2: Conduct studies to examine the correlation between reproductive success and contaminant loads.

Analysis of the feathers, eggs, and dead chicks of black-footed albatrosses at Midway Atoll will determine the levels of persistent environmental contaminants. These data will be used as a surrogate for estimating contaminant body-burdens in short-tailed albatrosses.

Activity TES-4.3: Create and disseminate information on fisheries bycatch and bycatch reduction to all fisheries occurring outside the Monument.

Materials will be created for public outreach and attendance at domestic and international meetings to carry out government-to-government communication on fisheries mitigation measures that can reduce bycatch during commercial fishing operations.

Strategy TES-5: Conduct activities to increase Laysan duck populations in the Monument over the life of the plan.

The Laysan duck, endemic to the Hawaiian Islands, was federally listed as endangered in 1967. Prior to 2004, only a single population of the species remained, on Laysan Island. Since 2004, a second population of Laysan ducks has been established at Midway Atoll, through two translocations of subadults from Laysan Island. Current population estimates at both Midway and Laysan indicate a population size of fewer than 800 individuals. Within 15 years, the target, based on interim downlisting criteria in the Draft Revised Recovery Plan for the Laysan Duck (FWS 2004), is to ensure that at least five stable populations occur in predator-free or predator-controlled sites throughout the Monument and main Hawaiian Islands, and that the population at Laysan is stable or increasing. The plan also calls for island-specific management plans for each population that identify habitat improvement, predator control, and population supplementation as needed.

Activity TES-5.1: Continue population monitoring on Laysan Island and Midway Atoll.

Activities include population size estimation through mark-recapture and monitoring of reproductive success and survival for population modeling; disease screening and prevention to avoid translocation of unhealthy individuals; and genetics research to prevent loss of genetic diversity during population translocations. Monitoring Laysan duck populations for potential human disturbance, especially during molt (when the birds are flightless) and during the nesting season, is necessary when disturbance may result in nest abandonment and brood fragmentation.

Activity TES-5.2: Carry out translocations to other sites in the Monument.

Required activities include restoring or creating habitat necessary to support Laysan duck populations; transporting juveniles from established populations to additional islands; and conducting post-release monitoring to assess foraging behavior, body condition, survival, habitat suitability, and reproductive success of translocated birds, as identified in the Draft Revised Recovery Plan for the Laysan Duck (FWS 2004).

Strategy TES-6: Maintain stable populations of the Laysan finch, Nihoa finch and Nihoa millerbird in the Monument over the life of the plan.

The Laysan finch, Nihoa finch, and Nihoa millerbird are endemic passerines in the NWHI that have extremely limited distributions within relatively sensitive biological systems. Because of the inherently small population sizes of these species as a result of the extremely limited habitat availability, all three of these passerine species in the Monument have been listed as federally endangered. The most recent population estimates indicate a total population size of approximately 10,000 Laysan finches, which occur only on Laysan Island and at Pearl and Hermes Atoll (a result of translocations conducted in 1967); fewer than 5,000 Nihoa finches, which occur only on Nihoa; and fewer than 600 Nihoa millerbirds, also endemic to Nihoa.

Activity TES-6.1: Continue to conduct annual censuses of populations of each passerine species and monitor their food and habitat requirements.

In particular, these monitoring activities allow for detection of changes in population and habitat availability by monitoring the status of native plant and terrestrial invertebrate populations. Monitoring methods will be assessed and altered as necessary to improve trend detection and develop knowledge of habitat requirements for these species.

Activity TES-6.2: Implement translocations of each species and site restoration as needed by developing appropriate techniques for capture, translocation, release, and monitoring.

Capture, translocation, and restoration are critical steps in establishing additional populations. These potential translocations will provide a buffer against catastrophic declines of current natural populations.

Strategy TES-7: Establish populations of each listed plant species on one to three additional Monument islands and ensure genetic material is also protected in approved repositories.

Amaranthus brownii, *Schiedea verticillata*, and *Pritchardia remota* are believed to be endemic to Nihoa. *A. brownii*, an herbaceous annual, is the rarest native plant species on Nihoa; when last seen in 1983, only 35 plants were located. *S. verticillata*, a perennial herbaceous species, is confined to approximately 10 colonies totaling fewer than 400 individuals on Nihoa. *P. remota*, a long-lived perennial fan palm, has fewer than 1,500 individuals and occurs in four valleys on Nihoa. Because of the small number of existing individuals and their extremely limited distributions, these species are subject to an increased likelihood of extinction from random events. *Cenchrus agrimonioides* var. *laysanensis* was known historically only from the NWHI at Laysan Island, Kure Atoll, and Midway Atoll. Although *C. agrimonioides* var. *agrimonioides* currently occurs on O‘ahu and Maui, the *laysanensis* variety has not been observed since 1973. *Mariscus pennatifolius* spp. *bryanii*, a member of the sedge family, is known only from Laysan Island, and comprises only one to 200 individuals annually.

Activity TES-7.1: Ensure all endangered plant species from Nihoa and Laysan Island are fully represented in an ex situ collection such as a nursery or arboretum.

For these extremely rare taxa, it is critical to ensure that these plants are maintained in off-site locations to protect them from extinction should these in situ populations or their critical habitat experience a catastrophic event. Using guidelines for collection described in an authorized Endangered Species Permit, seeds of all listed plants will be collected and sent to seed banks such as the Lyon Arboretum and National Tropical Botanical Garden.

Activity TES-7.2: Increase numbers and locations of *Amaranthus brownii* and *Schiedea verticillata* on Nihoa by 2018.

Existing colonies will be augmented via outplanting, and factors restricting colony expansion (e.g., competition from alien species) will be eliminated. Attempts will be made to establish new colonies within the historical range of these species by identifying key environmental factors associated with plant growth and reproduction, preparing the sites, propagation, outplanting, and post-planting maintenance.

Activity TES-7.3: Establish a self-sustaining *Pritchardia remota* population on Laysan Island by 2012.

In accordance with the Draft Laysan Island Restoration Plan (Morin and Conant 1998), sites will continue to be prepared for planting and elimination of immediate threats, such as alien plants. Purity of seed stocks will be ensured by using standard operating procedures for maintaining the plants in the field. Frequent monitoring will be conducted to improve outplanting methods

and protect the site from alien species invasion, and plant vigor data will be collected to guide future outplanting strategies and techniques.

Activity TES-7.4: Continue greenhouse operations on Laysan Island to propagate and outplant rare plant taxa.

The plant propagation facility at Laysan Island is described in the Draft Laysan Island Restoration Plan (Morin and Conant 1998). *Pritchardia remota* seeds are collected at Nihoa and *Mariscus pennatiformis* seeds are collected following collection guidelines, including taking no more than 15 percent of seeds from any source plant. For *Pritchardia remota*, the surface of the seeds is sterilized before transporting them to Laysan Island to ensure that they are free of pests, diseases, and pathogens. The plants are germinated in shade houses and outplanted after they reach the optimal size for subsequent survival in the wild. A plant restoration database for Laysan is maintained to document variations in handling and treatment protocols and success after outplanting. All monitoring, collection, propagation, and outplanting follow guidelines from the Hawai'i Rare Plant Restoration Group, including Instructions and Methods, Collecting and Handling Protocols, and General Reintroduction/Outplanting Guidelines.

Activity TES-7.5: Evaluate the potential to establish one to three colonies of *Amaranthus brownii*, *Schiedea verticillata*, and *Pritchardia remota* outside of their historical ranges.

To protect the taxa from catastrophic events and achieve recovery objectives, it may be necessary to establish colonies of each taxa on other islands outside their historical range. Impacts on native flora and fauna at transplant sites will need to be assessed and evaluated to prevent the risk of hybridization with closely related species. Factors to consider include avoiding impacts to native species at establishment sites, finding suitable habitat, and choosing areas accessible enough to allow for planting and monitoring of introduced populations. Mokumanamana, Laysan Island, Kure Atoll, and Eastern and Sand Islands at Midway Atoll should be considered as potential sites.

Strategy TES-8: Ensure protection of threatened and endangered species by facilitating Endangered Species Act consultations for Monument activities throughout the life of the plan.

Since threatened and endangered species occur within the Monument, actions proposed by Federal agencies frequently require consultation with NMFS or FWS. Section 7(a)(2) of the ESA requires that federal agencies consult with NMFS for listed species under its jurisdiction and with the FWS for listed species under its jurisdiction (jurisdiction for sea turtles is shared by the two agencies) on actions that the federal agencies conclude may affect listed species or designated critical habitat.

This strategy undertakes the activities required to increase the capacity of the consultation actions under the ESA, promote timely and effective coordination among the action agencies and consulting agencies, and produce current baseline assessments of key species and designated critical habitat. These activities will help to improve the consultation process for all involved and result in protection and recovery of listed species and habitat.

Activity TES-8.1: Increase the capacity of NMFS and FWS to address ESA consultations for activities within the Monument.

This activity will seek to build the capacity of the consulting agencies to conduct consultations and coordinate with the action agencies and Monument staff. This activity will implement programs to improve the consulting personnel's knowledge about the species, habitat, and agency consultation procedures and laws. Such a program will include, among other elements, appropriate education, training, and regular interaction with species and habitat experts who can provide valuable input and review.

Additional staffing will most likely be needed by the agencies to carry out federal consultation requirements; staff will have expertise in ESA regulatory requirements, work to complete consultations in a timely fashion, coordinate between agencies and the Monument staff, appropriately integrate relevant biological information on the subject listed species or critical habitat, and develop and deliver Section 7 workshops for action agencies.

Activity TES-8.2: Develop baseline assessments for listed species and critical habitat and streamline the Monument consultation process to facilitate ESA consultations.

This activity will assist Monument managers, consulting agencies, and action agencies by producing ecological baselines of listed species and critical habitat, description of sensitive areas, and other information that can be considered early in any planning process relevant to the Monument. This information will be made available to action agencies to assist them in determining whether their activities may affect listed species and, if so, improve their biological assessments for consultations. It also will assist NMFS and FWS staff in evaluating proposed actions and developing their biological opinions. Also, ESA and other consultation procedures will be reviewed and streamlined and benefit from the preparation of current descriptions.

Activity TES-8.3: Work with federal agencies proposing activities in the Monument to increase their knowledge about the ESA and listed species and critical habitat in the Monument.

An action agency must be knowledgeable about the species, habitat, and laws directing consultation. When an action agency makes a determination regarding whether to consult and how to consult, the determination should be based on sound science and according to the criteria set forth in the regulatory regime implementing the ESA. To help action agencies recognize when their activities may affect listed species or critical habitat and the character of the effects, NMFS and the FWS will coordinate with its partners to build capacity within the action agencies.

Capacity building activities in this activity include the development and delivery by NMFS and FWS of targeted workshops that provide information on the requirements for ESA consultations and on the Monument listed species and critical habitat and working with partners to develop a cache of "best practices" and other operations protocols to avoid any impacts to listed species and habitat. These workshops and other like information exchanges will help to reduce and avoid any detrimental effects to listed species and critical habitat, improve the overall relationship with action agencies, and facilitate timely and effective consultations.

Table 3.2.1 Summary of Strategies, Activities, and Agency Leads for Threatened and Endangered Species

Strategies and Activities	Agency Lead
Strategy TES-1: Support activities that advance recovery of the Hawaiian monk seal for the life of the plan.	
Activity TES-1.1: Support marine debris removal activities to promote recovery.	NOAA
Activity TES-1.2: Support and facilitate emergency response for monk seals.	NOAA
Activity TES-1.3: Conserve Hawaiian monk seal habitat.	NOAA
Activity TES-1.4: Reduce the likelihood and impact of human interactions on monk seals.	NOAA
Activity TES-1.5: Support outreach and education on Hawaiian monk seals.	NOAA
Activity TES-1.6: Reduce shark predation on monk seals	NOAA
Strategy TES-2: Determine the status of cetacean populations and verify and manage potential threats over the life of the plan.	
Activity TES-2.1: Census cetacean populations.	NOAA
Activity TES-2.2: Conduct annual spinner dolphin mark and recapture photo identification surveys.	State of Hawai'i
Activity TES-2.3: Monitor, characterize, and address the effects of marine debris on cetaceans in the Monument.	NOAA
Activity TES-2.4: Respond to any suspected disease and unusual mortality incidents affecting cetaceans.	NOAA
Activity TES-2.5 Prevent human interactions with cetaceans.	NOAA
Strategy TES-3: Ensure that nesting populations of green turtles at source beaches are stable or increasing over the life of the plan.	
Activity TES-3.1: Collect biological information on nesting turtle populations.	FWS
Activity TES-3.2: Protect and manage nesting and basking habitat.	FWS
Activity TES-3.3: Protect and manage marine habitat, including foraging areas and migration routes.	NOAA
Strategy TES-4: Work with the international recovery team for short-tailed albatrosses to facilitate an increase in the total breeding population of this species to at least 25 breeding pairs occurring on sites other than Torishima and Senkaku islands.	
Activity TES-4.1: Work cooperatively with the Japanese government to establish one or more breeding populations on islands free from threats such as active volcanoes and introduced mammals.	FWS
Activity TES-4.2: Conduct studies to examine the correlation between reproductive success and contaminant loads.	FWS
Activity TES-4.3: Create and disseminate information on fisheries bycatch and bycatch reduction to all fisheries occurring outside the Monument.	NOAA
Strategy TES-5: Conduct activities to increase Laysan duck populations in the Monument over the life of the plan.	
Activity TES-5.1: Continue population monitoring on Laysan Island and Midway Atoll.	FWS
Activity TES-5.2: Carry out translocations to other sites in the Monument.	FWS

Strategies and Activities	Agency Lead
Strategy TES-6: Maintain stable populations of the Laysan finch, Nihoa finch, and Nihoa millerbird in the Monument over the life of this plan.	
Activity TES-6.1: Continue to conduct annual censuses of populations of each passerine species and monitor their food and habitat requirements.	FWS
Activity TES-6.2: Implement translocations of each species and site restoration as needed by developing appropriate techniques for capture, translocation, release, and monitoring.	FWS
Strategy TES-7: Establish populations of each listed plant species on one to three additional Monument islands and ensure genetic material is also protected in approved repositories.	
Activity TES-7.1: Ensure all endangered plant species from Nihoa and Laysan Island are fully represented in an ex situ collection such as a nursery or arboretum.	FWS
Activity TES-7.2: Increase numbers and locations of <i>Amaranthus brownii</i> and <i>Schiedea verticillata</i> on Nihoa by 2018.	FWS
Activity TES-7.3: Establish a self-sustaining <i>Pritchardia remota</i> population on Laysan Island by 2012.	FWS
Activity TES-7.4: Continue greenhouse operations on Laysan Island to propagate and outplant rare plant taxa.	FWS
Activity TES-7.5: Evaluate the potential to establish one to three colonies of <i>Amaranthus brownii</i> , <i>Schiedea verticillata</i> , and <i>Pritchardia remota</i> outside of their historical ranges.	FWS
Strategy TES-8: Ensure protection of threatened and endangered species by facilitating Endangered Species Act consultations for Monument activities throughout the life of the plan.	
Activity TES-8.1: Increase the capacity of NMFS and FWS to address ESA consultations for activities within the Monument.	FWS NOAA
Activity TES-8.2: Develop baseline assessments for listed species and critical habitat and streamline the Monument consultation process to facilitate ESA consultations.	NOAA FWS
Activity TES-8.3: Work with federal agencies proposing activities in the Monument to increase their knowledge about the ESA and listed species and critical habitat in the Monument.	NOAA FWS

3.2.2 Migratory Birds Action Plan

Desired Outcome

Conserve migratory bird populations and habitats within Papahānaumokuākea Marine National Monument.

Links to other Action Plans	
3.2.3	Habitat Management and Conservation
3.3.2	Alien Species
3.3.4	Emergency Response
3.5.4	Ocean Ecosystems Literacy
3.6.3	Coordinated Field Operations

Current Status and Background

In 1903, President Theodore Roosevelt placed Midway under the jurisdiction and control of the Navy to stop the “wanton destruction of birds that breed on Midway.” In 1909, he ordered that “the following islets and reefs, namely: Cure Island, Pearl and Hermes Reef, Laysianki or Pell Island, Laysan Island, Mary Reef, Dowsetts Reef, Gardiner Island, Two Brothers Reef, French Frigate Shoal, Necker Island, Frost Shoal and Bird Island ...are hereby reserved and set apart, subject to valid existing rights, for the use of the U.S. Department of Agriculture as a preserve and breeding ground for native birds.” Thus, native birds were the first wildlife species for which the Monument area was managed for conservation purposes by the U.S. Government. Early protection was important in ensuring the large, diverse seabird and shorebird populations present today in the Monument. Seabird colonies in the NWHI constitute one of the largest and most important assemblages of tropical seabirds in the world, with approximately 14 million birds (6 million breeding annually), representing 22 species. Greater than 95 percent of the world’s Laysan and black-footed albatrosses nest here. For several other species, such as the Bonin petrel, Christmas shearwater, Tristram’s storm-petrel, and gray-backed tern, the NWHI supports colonies of global significance. For the species of boreally breeding shorebirds that overwinter in the tropical Central Pacific, the NWHI are an essential stopover or wintering site. In particular, the bristle-thighed curlew relies on the mammal-free islands of the Monument because it goes through a flightless period during molt and is very vulnerable to predation.

Links to goals
Goal 1
Goal 2
Goal 3
Goal 4
Goal 5

Need for Action

The majority of all tropical seabirds in Hawai‘i nest in the Monument, and those breeders plus an equal number of species of nonbreeding seabirds transit through or forage in the waters of the Monument. While the breeding colonies are secure from future development and disturbance, a variety of threats still faces seabirds in the Monument, including contaminants left from former activities in the area and contaminants, such as oil, arriving from the sea; habitat loss to sea level rise; changes in food availability resulting from climate change; marine debris, which causes both ingestion and entanglement hazards; invasive species; fisheries interactions outside the Monument boundary; and wildlife diseases. Breeding seabirds and migratory shorebirds rely on terrestrial areas of the Monument for valuable wintering habitat, free of mammalian predators.

Statute and policy at several levels mandate the protection and management of migratory bird populations in the Monument. The primary federal protective measure for these species is the Migratory Bird Treaty Act of 1918, which prohibits hunting, taking, capturing, killing, or selling of seabird species, and also fully protects eggs, nests, and feathers from collection or destruction. Additional directives from international treaties, domestic legislation, executive orders, state law, and FWS policy require the protection, monitoring, and assessment of migratory nongame birds;

determination of the effects of environmental changes and human activities on migratory birds; and active protection of colonies, roosts, loafing sites, and adjacent waters for seabirds.

Strategies to Achieve the Desired Outcome

Four strategies have been identified for achieving the desired outcomes of protecting and enhancing migratory bird populations in the Monument. The strategies and activities are coded by the acronym for the action plan title, “Migratory Birds” (MB). A summary of strategies and activities is provided in Table 3.2.2 at the end of this action plan.

- MB-1: Protect and enhance habitats for terrestrial and marine migratory birds throughout the life of the plan.
- MB-2: Minimize the impact of threats to migratory birds such as habitat destruction by invasive species, disease, contaminants (including oil), and fisheries interactions for the life of the plan.
- MB-3: Monitor populations and habitats of migratory birds at a level sufficient to ascertain natural variation and then to detect changes in excess of that variation that might be attributed to human activities, including anthropogenic climate change.
- MB-4: As threats are removed, restore seabird species at sites where they have been extirpated.

Strategy MB-1: Protect and enhance habitats for terrestrial and marine migratory birds for the life of the plan.

Safe habitats for breeding and foraging are essential for all of the migratory birds using the Monument. While most seabirds and shorebirds exhibit some flexibility in their habitat requirements, features of the plant community (species and structural characteristics) favor or limit populations.

Activity MB-1.1: Control or eradicate nonnative species at all sites where they have a negative impact on the survivorship or reproductive performance of migratory birds.

Invasive species affect survival and reproduction of migratory birds by causing direct mortality through predation or parasitism, or by modifying the habitat to make it less suitable for survival or reproduction. Invasive species that have been shown to diminish the quality of migratory bird habitat in the Monument include several plants such as sandbur (*Cenchrus echinatus*), ironwood (*Casuarina equisetifolia*), and golden crownbeard (*Verbesina encelioides*), and introduced scale insects and associated ants that damage vegetation providing appropriate habitat for migratory birds. (See Section 3.3.2, Alien Species Action Plan.)

Activity MB-1.2: Restore components of the native plant communities that are important to seabird nesting.

Opportunities for restoring native habitats for seabirds exist wherever nonnative species have been eradicated or controlled or human activities limiting migratory bird species have ceased. Translocation, propagation, and outplanting of native plants (*Eragrostis variabilis*, *Sesbania tomentosa*, *Sida fallax*, *Scaevola sericea*, etc.) to improve habitat for migratory bird nesting and foraging are ongoing at Laysan Island and Midway and Kure Atolls and are planned for other sites in the Monument (Rehkemper et al. 2005).

Strategy MB-2: Minimize the impact of threats to migratory birds such as habitat destruction by invasive species, disease, contaminants (including oil), and fisheries interactions for the life of the plan.

The original motivation for the protection of the area by the federal government was to eliminate illegal harvest of breeding seabirds. Minimizing threats to migratory bird populations remains a primary concern.

Activity MB-2.1: Conduct surveillance for evidence of avian disease outbreaks, and follow existing response plan if disease is detected.

The MMB participates with other National Wildlife Refuges and agencies as partners in the Hawai‘i–Pacific Islands Working Group on Avian Influenza Surveillance to guard against wildlife diseases such as Asian H5N1 Avian Influenza. Staff report all instances of unusual mortality and collect samples using approved safety protocols and protective gear. If avian influenza is detected, Monument staff will use the Highly Pathogenic Avian Influenza Disease Contingency Plans in place for the Midway Atoll NWR and Hawaiian Islands NWR.

Activity MB-2.2: Monitor contaminant levels in birds and their habitats, and respond if the potential exists to cause immediately lethal or sublethal effects.

Bird health and contaminant levels in areas of contamination that have already been identified will be monitored, and unexplained health problems in other areas will be evaluated for possible links to contaminants.

Activity MB-2.3: Ensure that all spill response plans have adequate coverage of actions necessary to minimize mortality to migratory birds.

Monument staff will coordinate with and provide technical contributions regarding migratory birds to multiagency spill prevention and pre-spill activities, as well as actual response actions and Natural Resource Damage Assessments. (Also see Section 3.3.4, Emergency Response Plan.) Staff will contribute to keeping seabird and shorebird information current for the area contingency plan and maintain a list of restoration activities for the Co-Trustees.

Activity MB-2.4: Maintain rigorous quarantine protocols to prevent the introduction of alien species that may prove hazardous specifically to migratory birds.

Alien species are one of the greatest threats to migratory birds, either directly in the case of pathogens or predators, or indirectly in the case of invasive plants or animals that damage habitat. Rigorous quarantine protocols must be maintained to ensure new alien species are not introduced or transmitted from one island to another. (See Section 3.3.2, Alien Species Action Plan.)

Activity MB-2.5: Work with partners to reduce the impact of commercial and sport fisheries outside the Monument on migratory bird populations.

Sport and commercial fishing was eliminated, or is being phased out, within the Monument. However, such activities outside the Monument can adversely impact Monument resources. FWS established national policy in 2001 that identified the bycatch of migratory birds in fisheries as a serious conservation problem and may be inconsistent with of the underlying tenets

of the Migratory Bird Treaty Act. FWS and the U.S. Department of State worked with NMFS to draft a National Plan of Action for addressing the problem of seabird bycatch to comply with the Code of Conduct for Responsible Fisheries developed by the Food and Agriculture Organization of the United Nations. This group of agencies and representatives of the Regional Fisheries Management Councils work with industry and conservation organizations to guide implementation of the National Plan of Action to reduce fishing impacts. Laysan albatrosses and black-footed albatrosses, two of the species most affected by bycatch mortality in the northern hemisphere, nest almost exclusively in the Monument, so the responsibility to provide data on seabird population status and biological expertise regarding the problem falls to Monument staff. Staff provide additional assistance by teaching seabird identification skills to fishers and fisheries observers and by assisting with the development of mitigation techniques. Implementation of many of the actions identified in the FWS Migratory Bird Draft Conservation Action Plan for Black-footed Albatross (*Phoebastria nigripes*) and Laysan Albatross (*P. immutabilis*) will involve Monument staff.

Activity MB-2.6: Research mite impacts on black-footed albatross chicks on Kure Atoll.

Mites (including the native mite *Womersia midwayensis*) causing mortality and morbidity on black-footed albatross (*P. nigripes*) chicks on Kure Atoll should be investigated. This activity is necessary to determine the preferred habitat of mites and assess the potential to alter habitat or discourage albatross nesting.

Strategy MB-3: Monitor populations and habitats of migratory birds to ascertain natural variation and to detect changes in excess of that variation that might be attributed to human activities, including anthropogenic climate change.

Monitoring migratory bird populations and habitats is necessary to detect changes in excess of natural variation that might be attributed to human activities. Monitoring must include statistically valid sample sizes and must provide time series long enough for credible evaluations of population responses to threats and management actions.

Activity MB-3.1: Using standard methods devised for tropical seabirds, monitor a suite of 15 focal seabird species at specific sites in the Monument to track changes in population size and understand underlying causes of that change.

A coordinated program to assess the status and trends of seabird populations is essential to provide scientific information necessary to make management decisions and to evaluate the efficacy of management actions. The Regional Seabird Conservation Plan (FWS Pacific Region 2005) recommends inventories of all seabird colonies at long-term intervals, such as every ten years, and intensive quantitative monitoring of specific parameters, such as survival or population size of a select group of species at selected localities, on an annual basis. The 15 focal species were identified during a review of seabird monitoring in the NWHI by the U.S. Geological Survey and FWS and were chosen because they are Birds of Conservation Concern, stewardship species of the NWHI, or representative of specific foraging or breeding guilds. A recently completed assessment of seabird monitoring for Hawai'i and the Pacific (Citta, Reynolds, and Seavy 2006) will be used to develop a standardized seabird monitoring plan for the Monument as well as other areas in the U.S. Central Tropical Pacific. As part of the plan, the monitoring data will be maintained in the PIMS.

Activity MB-3.2: Monitor changes in habitat quality by measuring reproductive performance and diet composition in selected seabird species.

Parameters such as hatching success, fledging success, and diet composition provide a more immediate indication of ocean conditions and prey abundance and availability than does long-term population monitoring. This is because seabirds take many years to mature to recruitment into the breeding population, and actual fluctuations in the number of breeders may reflect conditions that occurred five to ten years previously. As a result, quantification of population parameters such as reproductive success and survival, and subsequent modeling of population trends, provides a better understanding of the status of these seabird populations.

Activity MB-3.3: Develop and use standardized methods to accurately assess the population size and trends of over-wintering and migrating Pacific golden plovers, bristle-thighed curlews, wandering tattlers, and ruddy turnstones.

Repeatable surveys at reference sites where we can predict continuity of measurement in the future will allow us to evaluate long-term changes in transient and winter resident shorebirds in the Monument and contribute to international monitoring of these wide-ranging species.

Strategy MB-4: As threats are removed, restore seabird species at sites where they have been extirpated.

Many examples of extremely successful conservation programs are based on the principle that populations can be restored to an area if a limiting threat is removed. Seabird populations that formerly occurred at various sites in the Monument have the potential to be restored by using behavioral manipulation techniques such as colony attraction through sound and visual stimuli or the provision of artificial nest structures.

Activity MB-4.1: Use social attraction techniques to encourage recolonization at Midway and Kure Atolls by Bulwer's petrels and Tristram's storm-petrels.

The introduction of Polynesian rats to Kure sometime before 1912 and of black rats to Midway in 1943 resulted in the extirpation of these two small seabird species at these two atolls. Both rat species have now been eradicated. Petrel species are typically very conservative about dispersing and starting new colonies, but successful restoration of petrels using social attractants such as playing recorded calls has been documented in several studies (Podolsky and Kress 1987), and the provision of nest boxes has been shown to enhance reproductive success and thus accelerate the recolonization process (Bolton et al. 2004).

Table 3.2.2 Summary of Strategies, Activities, and Agency Leads for Migratory Birds

Strategies and Activities	Agency Lead
Strategy MB-1: Protect and enhance habitats for terrestrial and marine migratory birds throughout the life of the plan.	
Activity MB-1.1: Control or eradicate nonnative species at all sites where they have a negative impact on the survivorship or reproductive performance of migratory birds.	FWS
Activity MB-1.2: Restore components of the native plant communities that are important to seabird nesting.	FWS
Strategy MB-2: Minimize the impact of threats to migratory birds such as habitat destruction by invasive species, disease, contaminants (including oil), and fisheries interactions for the life of the plan.	
Activity MB-2.1: Conduct surveillance for evidence of avian disease outbreaks, and follow existing response plan if disease is detected.	FWS
Activity MB-2.2: Monitor contaminant levels in birds and their habitats, and respond if the potential exists to cause immediately lethal or sublethal effects.	FWS
Activity MB-2.3: Ensure that all spill response plans have adequate coverage of actions necessary to minimize mortality to migratory birds.	FWS
Activity MB-2.4: Maintain rigorous quarantine protocols to prevent the introduction of alien species that may prove hazardous specifically to migratory birds.	FWS
Activity MB-2.5: Work with partners to reduce the impact of commercial and sport fisheries outside the Monument on migratory bird populations.	FWS
Activity MB-2.6: Research mite impacts on black-footed albatross chicks on Kure Atoll.	State of Hawai'i
Strategy MB-3: Monitor populations and habitats of migratory birds to ascertain natural variation, including anthropogenic climate change.	
Activity MB-3.1: Using standard methods devised for tropical seabirds, monitor a suite of 15 focal seabird species at specific sites in the Monument to track changes in population size and understand underlying causes of that change.	FWS
Activity MB-3.2: Monitor changes in habitat quality by measuring reproductive performance and diet composition in selected seabird species.	FWS
Activity MB-3.3: Develop and use standardized methods to accurately assess the population size and trends of over-wintering and migrating Pacific golden plovers, bristle-thighed curlews, wandering tattlers, and ruddy turnstones.	FWS
Strategy MB-4: As threats are removed, restore seabird species at sites where they have been extirpated.	
Activity MB-4.1: Use social attraction techniques to encourage recolonization at Midway and Kure Atolls by Bulwer's petrels and Tristram's storm-petrels.	FWS

3.2.3 Habitat Management and Conservation Action Plan

Desired Outcome

Protect, maintain, and where appropriate, restore the native ecosystems and biological diversity of Papahānaumokuākea Marine National Monument.

Links to Other Action Plans	
3.2.1	Threatened and Endangered Species
3.2.2	Migratory Birds
3.3.2	Alien Species
3.5.1	Agency Coordination
3.5.4	Ocean Ecosystems Literacy
3.6.3	Coordinated Field Operations

Current Status and Background

Presidential Proclamation 8031 prescribes ecosystem-based management for the Northwestern Hawaiian

Islands, and the National Wildlife Refuge System Administration Act of 1966, as amended, also requires such management for all NWRs. They require protections of ecosystem structure and function; conservation of fish, wildlife, plants, and their habitats; and ensuring the biological integrity, diversity, and environmental health of the Monument. Section 1.1 of this Monument

Links to Goals
Goal 1
Goal 2
Goal 3
Goal 4

Management Plan describes habitats in the NWHI, ranging from abyssal benthic areas to the high cliff faces of Nihoa and Mokumanamana (Necker), and Section 1.2 elaborates on the historical and current status of those habitats as well as describing resources of concern in the Monument. The Environmental and Anthropogenic Stressors section (1.3) describes known threats to biological integrity, diversity, and environmental health of the Monument. Habitat management activities included in this action plan include inventory of Monument resources, characterizing habitat health, investigating problems, changing plant communities to meet ecosystem goals, removing contaminants, preserving wilderness character, and engaging in ecological restoration of native habitats.

Need for Action

While the Monument remains one of the most remote and undisturbed archipelagos in the world, it still requires active habitat management on the part of managers to fulfill the mandate of protecting, maintaining, and restoring its wide range of native habitats. Furthermore, FWS has a mandate to conserve and restore, where appropriate, wildlife and habitats on NWRs. In accordance with refuge system laws and policies, management must “maintain existing levels of biological integrity, diversity, and environmental health at the Refuge scale. Following that, [managers] will restore lost or degraded elements of biological integrity, diversity, and environmental health at all landscape scales where it is feasible and supports fulfillment of refuge purposes” (601 FW 3). Restoration, when and where appropriate, will be undertaken using best available information about pre-disturbance conditions. This action plan will provide guidance for management of Monument lands and waters, rationale for the activities listed, and a framework for continuity and consistency in habitat management decisions for the life of the plan.

Strategies to Achieve the Desired Outcome

Strategies for conservation and management in the varied habitats of the Monument have been identified to achieve the desired outcome of protecting native ecosystems and biological diversity. The strategies and activities are coded by the acronym for the action plan title, “Habitat Management and Conservation” (HMC). A summary of strategies and activities is provided in Table 3.2.3 at the end of this action plan.

- HMC-1: Within 15 years, develop and implement a strategy for restoring the health and biological diversity of the shallow reefs and shoals where anthropogenic disturbances are known to have changed the ecosystem, using best available information about pre-disturbance conditions.
- HMC-2: Within 10 years, investigate and inventory sources of known contamination from historical human uses of the NWHI and, where appropriate, coordinate with responsible parties to develop plans and complete cleanup actions.
- HMC-3: Protect and restore beach strand and crest habitats over the life of the plan.
- HMC-4: Within 10 years, restore and maintain coastal mixed grasses and shrubs on all the coralline islands and atolls of the Monument using best available historical information about the original indigenous ecosystem.
- HMC-5: Within 10 years, restore and maintain coastal mixed grasses and shrublands on basalt islands in the Monument.
- HMC-6: Maintain and better understand the Monument’s wetland and mudflat habitats to benefit migratory shorebirds and waterfowl for the life of the plan.
- HMC-7: Maintain, enhance, and, where appropriate, develop freshwater seeps, intermittent streams, and freshwater ponds as necessary for the benefit of native species for the life of the plan.
- HMC-8: Maintain no more than 150 acres of ironwood woodlands on Sand Island, Midway Atoll, to provide seabird nesting and roosting habitat for the life of the plan.
- HMC-9: Protect and maintain 120 acres of vertical rocky cliff-face habitat at Nihoa and Mokumanamana for nesting seabirds for the life of the plan.

Strategy HMC-1: Within 15 years, develop and implement a strategy for restoring the health and biological diversity of the shallow reefs and shoals where anthropogenic disturbances are known to have changed the ecosystem, using best available information about pre-disturbance conditions.

The shallow reef (less than 16 fathoms, 30 meters) areas of the Monument have been affected by a variety of human activities through the years, including overharvesting of some species, dredging and filling, and anchor damage from vessels stopping in the area. The extent and relative severity of these impacts are poorly understood.

Activity HMC-1.1: Identify and prioritize restoration needs in shallow water reef habitats impacted by anthropogenic disturbances within 5 years.

For more than 100 years, human activities in the NWHI have created disturbance in natural systems. Many such actions affecting marine and terrestrial wildlife are known, but the impacts of disturbance in the marine environment in particular, opportunities for restoration, and priorities for undertaking restoration actions are not thoroughly analyzed. One example of a

shallow-reef marine organism that has been negatively impacted by human activities is the black-lipped pearl oyster (*Pinctada margaritifera*), which has not recovered at Pearl and Hermes atoll since it was intensely harvested in the 1920s (Galtsoff 1933; Keenan et al. 2006). Where appropriate, and using the best available information about pre-disturbance conditions, opportunities for restoring species will be identified and prioritized.

Activity HMC-1.2: Analyze historical and present impacts on reef growth at Midway Atoll and determine factors limiting nearshore patch reef growth to facilitate restoration of natural reef building.

Midway Atoll has been the site of the most dramatic modification of reef circulation and the most prolific source of anthropogenic inputs to nearshore reefs in the NWHI. Evaluating these pressures and their effects on reefs will provide useful information to help replace lost ecosystem function and integrity of reefs at Midway and potentially at other sites with similar threats to nearshore reef habitats.

Activity HMC-1.3: Where feasible, implement appropriate restoration activities.

As follow-up to identifying restoration priorities (HMC-1.1), appropriate restoration activities will be assessed (HMC-1.2), actions developed and, where feasible, implemented.

Strategy HMC-2: Within 10 years, investigate, inventory, and map sources of known contamination from historical human uses of the NWHI and, where appropriate, coordinate with responsible parties to develop plans and complete cleanup actions.

Human occupation and activity in the NWHI have resulted in numerous impacts, some of which can be categorized as contaminants that disrupt native ecosystems in various ways. These contaminants are found in both terrestrial and marine environments of the Monument and include, but are not limited to, heavy metals, iron, PCBs, and other organochlorines. Other materials that have come into the Monument by way of the ocean include pesticides, oil from undocumented spills at sea, and plastic marine debris (see Section 3.3.1, Marine Debris Action Plan). These contaminants occur both in known dumping sites and in areas less well characterized or not yet discovered.

Activity HMC-2.1: Evaluate effects of contamination in terrestrial and nearshore areas from shoreline dumps at French Frigate Shoals and at Kure, Midway, and Pearl and Hermes atolls and prioritize cleanup action based on risk assessments.

Various dumps left behind from military activities during World War II and the Cold War are disintegrating quickly. Runoff, erosion, and seepage from all of these dumps have contaminated nearshore habitats. The extent of the effects of this contamination to birds nesting on the dumps and marine organisms in adjacent waters will be investigated.

Activity HMC-2.2: Work with partners and responsible parties to verify the integrity of known landfills and dumps and to conduct additional remediation if necessary.

Landfills and dumping sites at Midway Atoll, such as the Old Bulky Waste Landfill, which was designated as a contaminated site during the Navy's Base Realignment and Closure (BRAC) program assessment at Midway, and "Rusty Bucket" on Sand Island at Midway, which was not designated contaminated in the BRAC assessment, need to be evaluated every five years for integrity, containment effectiveness, and hazard potential. Monument staff will work with the

U.S. Environmental Protection Agency (EPA) and the Navy to ensure best practices for preventing the contained contaminants at these sites from migrating out of the dump areas at Midway. In collaboration with the Coast Guard, EPA, and Hawai'i Department of Health, the Co-Trustees will work to investigate washing and leaching of PCBs from known dumps at Kure Atoll and to finish the removal of the dump at Tern Island, French Frigate Shoals, to achieve agreed-upon levels of PCBs there.

Activity HMC-2.3: Locate historic disposal sites at French Frigate Shoals and at Kure, Midway, and Pearl and Hermes atolls, and investigate them for contamination.

There is a need to search for documented but not yet located landfills at Tern and East Islands, French Frigate Shoals, and Southeast Island, Pearl and Hermes Atoll, and for underground storage tanks at Eastern Island, Midway Atoll. It is also important to investigate the 1993 unlined landfill created by the Coast Guard on Green Island, Kure Atoll, during remediation of the LORAN station to confirm that the PCBs placed in the unlined landfill are not leaching to groundwater and that the documented surface hot spots have been removed. In addition, the 25 milligram/kilogram cleanup level for PCBs should be evaluated to ensure that it is adequately protective of wildlife.

Activity HMC-2.4: Evaluate costs to ecosystem function and benefits of removing anthropogenic iron sources such as metal from shipwrecks and discarded debris from reefs throughout the Monument.

Increasing the available iron in tropical oceanic waters often results in an overgrowth of certain cyanobacteria that are naturally rare in the iron-limited environments of the tropical Pacific away from volcanic islands. The MMB will develop a catalog of all anthropogenic iron sources and the factors associated with each site that would enable prioritization for removal and a cost-benefit analysis.

Activity HMC-2.5: Continue collection and fingerprinting of oil found washed ashore and on wildlife from mystery spills to determine its provenance, and build an oil sample archive for possible use as evidence in liability assignment.

The occurrence of oil on nesting seabirds and washed up on beaches in the Monument that cannot be attributed to a known spill is a regularly recorded event at all the staffed sites in the NWHI. Because of the enormous foraging range of subtropical seabirds and the large number of vessels transiting the North Pacific, these spills are rarely attributed to any responsible party. Samples collected in the Monument can be used to compare with banks of petroleum signatures and may help in understanding more about the primary sources of this pollution.

Activity HMC-2.6: Continue monitoring the area at Laysan Island that was contaminated by the insecticide carbofuran.

In 1988, biologists first detected unexplained mortality of carrion flies and ghost crabs at a beach crest site on Laysan Island. These scavengers were coming in to feed on dead albatross chicks, commonly seen in summer months at Laysan. Upon entering the area later referred to as the "Dead Zone," they would abruptly die. The cause was finally identified by FWS as the pesticide carbofuran, and the area was cleaned by removing and treating on-site contaminated sand in 2002. Continued vigilance is needed to make sure that such effects do not flare up again in that area because of an overlooked hot spot.

Activity HMC-2.7: Conduct ecological risk assessment to determine allowable lead levels in soils at Midway and remove lead from buildings and soils to nonrisk levels.

Lead in the soils around many of the buildings at Midway is adversely affecting the birds nesting and burrowing in these areas by causing droop-wing and other lethal and sublethal effects. Before the lead can be effectively removed from the soil, an ecological risk assessment will be performed to determine the cleanup level necessary to ensure the protection of human and wildlife health. The lead-based paint flaking from the buildings at Midway will be removed to eliminate this contamination.

Strategy HMC-3: Protect and restore beach strand and crest habitats over the life of the plan.

Beach strand and beach crest habitats on French Frigate Shoals, Laysan Island, Lisianski Island, Pearl and Hermes Atoll, Midway Atoll, and Kure Atoll provide important habitat for a variety of native organisms, several of them listed as threatened or endangered. Anthropogenic threats, including previous manipulation of shorelines and additions of structures and the suite of effects to shoreline habitats associated with global climate change, make it necessary to actively manage these habitats in the Monument.

Activity HMC-3.1: Evaluate loss of beach strand and crest due to erosion and sea level rise to aid in formulating a restoration plan that will stop as much net loss of beach strand and beach crest habitat as is possible.

Projected sea level rise, increased storm frequency, changes in current patterns, and large wave events pose a particular danger to the low-lying terrestrial habitats of the Monument. In addition to sea level rise, invasive species threaten the dune stability, particularly golden crownbeard (*Verbesina encelioides*) and ironwood (*Casuarina equisetifolia*) on Kure and Midway Atolls. Monument staff will evaluate the loss of beach strand and crest in order to formulate a restoration plan.

Activity HMC-3.2: Inventory and map manmade structures and changes in natural beach and reef state that may influence erosion and depositional processes at all of the beach strand units of the Monument.

Human modification of shorelines and channels may be affecting ecosystem function in the NWHI. These features will be evaluated, their effects analyzed, and their restoration considered.

Strategy HMC-4: Within 10 years, restore and maintain coastal mixed grasses and shrubs on all the coralline islands and atolls of the Monument using best available historical information about the original indigenous ecosystem.

Coastal mixed grass and shrub habitats cover the majority of the Monument's terrestrial area and are important habitat for seabirds, shorebirds, landbirds, and terrestrial invertebrates. Careful review of historical botanical accounts and studies of pollen preserved in the anaerobic sediments of Laysan Lake (Athens, et al. 2007) provide a template for restoration of the plant communities of the coastal grass and shrublands.

Activity HMC-4.1: Propagate and outplant native species chosen on the basis of historical records at Midway and historical and pollen records from Laysan Island in 250 acres of

vegetated area at Midway Atoll, focusing on the original footprint of the island and then moving to the dredge spoils section.

Using seed sources deemed most appropriate by botanical experts, including bunchgrass (*Eragrostis variabilis*), naupaka (*Scaevola sericea*), morning glory (*Ipomoea pes caprae*, *I. indica*), *Solanum nelsonii*, *Capparus sandwichiana*, *Chenopodium oahuense*, and *Lepidium bidentatum*, and treated to maintain quarantine standards, Monument staff will propagate seeds in the greenhouse on Sand Island and outplant them in selected areas of the entire atoll.

Activity HMC-4.2: Implement the Draft Laysan Island Restoration Plan by removing invasive plants, and propagating and outplanting all extant species identified in the pollen record or historical documents as formerly having occurred at Laysan.

The Draft Laysan Island Restoration Plan (Morin and Conant 1998) details the biological history of the island's habitats and lays out a plan for ecological restoration of habitat structure and function. This document includes plans for restoration of plants, terrestrial arthropods, and avian components of the biological community that occurred at Laysan Island prior to human contact and the resultant loss of many of the island's species.

Activity HMC-4.3: At Laysan Island, replace 60 acres of the introduced shrub *Indian pluchea* with native species.

The need to provide appropriate nesting habitat and maintain elements of ecosystem function while restoring native species requires management of the timing of vegetation replacement. Reestablishment of the native shrub community (including *Sida fallax*, *Chenopodium oahuense*, and *Capparis sandwicensis*) will precede the removal of the alien plant *Pluchea indica* in order to maintain the ecosystem function of providing nesting substrate for red-footed boobies, great frigatebirds, and black noddies.

Activity HMC-4.4: Formulate and implement a restoration plan for Lisianski Island using guidelines established for neighboring Laysan Island.

Our current and historical knowledge of the vegetation community at Lisianski Island is less well developed than that of its neighbor, Laysan Island. Lisianski Island may provide good opportunities for ecological restoration following appropriate investigation of its botanical history. Sediments at the lowest part of the island will be sampled for ancient pollen to aid in reconstructing the composition and structure of the plant community prior to human visitation. Fossil pollen scientists believe that the soil of Lisianski Island may have characteristics amenable to the preservation of ancient pollen in the low-lying center of the island.

Activity HMC-4.5: Propagate and outplant native vegetation on 34-acre Southeast Island at Pearl and Hermes Atoll to replace native plant community extirpated by invasion of the alien plant golden crownbeard.

As golden crownbeard (*Verbesina encelioides*) is removed, native habitats will be restored on Southeast Island at Pearl and Hermes Atoll. This restoration is of great importance for the survival of several native plant populations, especially *Eragrostis variabilis*, *Solanum nelsonii*, *Tribulus cistoides*, *Lepidium bidentatum*, and *Boerhavia repens* at the northern end of the archipelago, and for a small translocated population of the endangered Laysan finch (*Telespyza cantans*). Propagules from the same native species still extant on several of the other islets in the atoll will be used.

Activity HMC- 4.6: Implement coordinated ecosystem restoration activities on Kure Atoll.

In 2007, the State of Hawai‘i began drafting a management plan for Kure Atoll. This plan includes prioritizing and eliminating ecosystem threats caused by past anthropogenic disturbances. Ongoing efforts to restore ecosystem function include removing invasive species and increasing the range of and the reintroduction of native plant species. These activities are designed to improve nesting, foraging, and resting habitat for migratory birds. Kure Atoll has been identified as a site for potential translocation of the endangered Laysan finch and Laysan duck. Assessment of the feasibility of these activities has begun.

Activity HMC-4.7: Monitor changes in the species composition and structure of mixed grass and shrub plant communities at each site.

An understanding of the range of natural variability caused by weather in these simple but dynamic vegetation communities allows managers to better evaluate the effectiveness of various management actions.

Strategy HMC-5: Within 10 years, restore and maintain coastal mixed grasses and shrublands on basalt islands in the Monument.

The coastal mixed grass and shrubland habitat of the basalt islands in the Monument (Nihoa and Mokumanamana, La Perouse Pinnacle, and Gardner Pinnacles) are remarkably intact with respect to their species composition and vegetation structure. They represent a window to the past in that they probably closely resemble the dryland coastal plant communities that have been lost in the main Hawaiian Islands.

Activity HMC-5.1: Inventory and document life histories of endemic terrestrial invertebrates at Nihoa and Mokumanamana.

The vegetation communities of Nihoa and Mokumanamana are the most intact native coastal plant assemblages in the State. They do suffer from the introduction of a number of alien insect species. Understanding the ecology of these new terrestrial arthropods will aid in identifying which species pose the greatest threat to the native coastal mixed grass and shrubland habitat, including the five endangered plant species there, and the endemic and native terrestrial invertebrates of these basalt islands.

Activity HMC-5.2: Monitor changes in species composition and structure of the coastal shrub and mixed grass communities on basalt islands throughout the life of the plan.

Surveys and mapping of the plant community will help document losses of native species and provide a template for restoration of any that are lost through invasive species competition, herbivory, or other means.

Strategy HMC-6: Maintain and better understand the Monument’s wetland and mudflat habitats to benefit migratory shorebirds and waterfowl for the life of the plan.

The vast oceanic areas that many boreal shorebirds and waterfowl must cross during their annual migration provide few resting places other than these small natural wetlands at Midway Atoll, Kure Atoll, Pearl and Hermes Atoll, and most importantly Laysan Island. While they are a small part of the total Monument area, they may provide a temporary habitat for migrant birds that determines their survival.

Activity HMC-6.1: Monitor water level, salinity, and other water quality parameters of Laysan Lake, and document any loss of lake area.

The hypersaline lake and associated mudflats at Laysan Island, and to a lesser extent, the ‘ākulikuli (*Sesuvium portulacastrum*) flats at Southeast Island, Pearl and Hermes Atoll, and Spit Island in Midway Atoll, serve as an important habitat for migratory waterfowl and shorebirds. Historically, during times of low vegetative cover caused by overbrowsing by rabbits or long periods of drought, the dunes have drifted into the lake.

Activity HMC-6.2: As needed, restore dune habitat on Laysan Island to stabilize movement if lake loss starts to occur.

Dune habitat can be effectively restored through vegetation protection or drift fences to minimize sand movement. Measures to slow sand movement may protect the wetland habitat at these sites.

Strategy HMC-7: Maintain, enhance, and, where appropriate, develop freshwater seeps, intermittent streams, and freshwater ponds as necessary for the benefit of native species for the life of the plan.

The vast majority of all the species of animals in the Monument can survive without access to any fresh water, but a few invertebrates, landbirds, and waterbirds at certain life stages (particularly the Laysan duck) require water with low salinity, and periodic access to these sources is essential. Freshwater sources are found at Nihoa, Mokumanamana, and Laysan Islands, and Midway and Kure Atolls.

Activity HMC-7.1: Monitor salinity, parasites, contaminants, and native arthropods associated with freshwater seeps, ponds, and streams.

The endemic passerines (particularly Nihoa finch and Laysan finch), the Laysan duck, and certainly a number of the native invertebrates, freshwater algae, and terrestrial arthropods rely on fresh water, particularly during their reproductive seasons. Water quality and abundance are important factors in the reproduction of many of these species.

Activity HMC-7.2: Evaluate potential for development and create as needed additional freshwater sources at potential translocation sites of the Laysan duck, Nihoa finch, Laysan finch, and Nihoa millerbird.

Some potential translocation sites for endangered endemic birds in the NWHI may contain all important habitat features for survival except for fresh water. Evaluation of the potential for water development at these locations will allow evaluation of overall translocation site suitability.

Strategy HMC-8: Maintain no more than 150 acres of ironwood woodlands on Sand Island, Midway Atoll, to provide seabird nesting and roosting habitat for the life of the plan.

The ironwood (*Casuarina*) forests at Sand Island provide nesting and roosting habitat for very large populations of white terns and the only breeding population of black noddies in the northern end of the Monument. While this species is an invasive nonnative, it does support these

large seabird populations and will be replaced with adequate native alternatives before removing it completely.

Activity HMC-8.1: Remove ironwood on Sand Island from 50 acres outside designated woodland and control young ironwood in areas managed for grass and shrubs.

Ironwood is a fast-spreading species that will displace other vegetation types if not restrained. Forested infestations can be treated with heavy machinery or cutting and application of Garlon®. Young *Casuarina* can be controlled by hand-pulling and cutting and herbicide treatment.

Activity HMC-8.2: Devise and implement methods for monitoring population size and reproductive success in tree-nesting seabird species.

Better census techniques for tree-nesting seabirds such as white terns and black noddies are needed to assist decisionmaking about vegetation management and ultimate replacement of introduced species with natives. These studies will enable evaluation of whether certain age classes or forest types are more productive than others for these seabirds.

Strategy HMC-9: Protect and maintain 120 acres of vertical rocky cliff-face habitat at Nihoa and Mokumanamana for nesting seabirds for the life of the plan.

Throughout Hawai‘i, vertical cliff habitats provide a safe haven for native birds, insects, and plants that can survive in the exposed inaccessible sites. Nihoa and Mokumanamana support colonies of cliff-nesting seabirds (white terns, black noddies, brown boobies, and white-tailed and red-tailed tropicbirds) and an unknown suite of plant and insect species on their dramatic rocky faces.

Activity HMC-9.1: Educate other federal and state agencies about overflight rules and promote compliance regarding overflights and close approaches.

Overflight restrictions are indicated on flight sectional charts, and the Federal Aviation Administration encourages pilots to maintain a minimum altitude of 2,000 feet above national wildlife refuges and national monuments. The Navy requires a minimum altitude of 3,000 feet over noise-sensitive areas such as national monuments. In addition, 50 CFR 27.34 prohibits the operation of aircraft at altitudes resulting in the harassment of wildlife. Aircraft approaches to the cliff habitats cause disturbance and possible loss of seabird eggs and chicks. Rapid turnover of personnel engaging in flights over the Monument has resulted in periodic overflights at too low an altitude. New staff (e.g., Coast Guard and DOD) will be made aware of the implications for wildlife disturbance.

Activity HMC-9.2: Develop and implement techniques for monitoring plant and animal populations on cliff habitats in the Monument within 10 years.

The cliff habitats of Nihoa and Mokumanamana are virtually inaccessible because of their height (up to 900 feet), windward location, and fragile rock type, which preclude safe climbing or rappelling. These cliffs provide habitat for significant proportions of seabirds, including white terns, black noddies, gray-backed terns, brown boobies, and red-tailed tropicbirds that nest on these islands. Monument staff will investigate culturally appropriate and innovative remote and direct methods as possible options for monitoring cliff habitats.

Table 3.2.3 Summary of Strategies, Activities, and Agency Leads for Habitat Management and Conservation

Strategies and Activities	Agency Lead
Strategy HMC-1: Within 15 years, develop and implement a strategy for restoring the health and biological diversity of the shallow reefs and shoals where anthropogenic disturbances are known to have changed the ecosystem, using best available information about pre-disturbance conditions.	
Activity HMC-1.1: Identify and prioritize restoration needs in shallow water reef habitats impacted by anthropogenic disturbances within 5 years.	NOAA
Activity HMC-1.2: Analyze historical and present impacts on reef growth at Midway Atoll and determine factors limiting nearshore patch reef growth to facilitate restoration of natural reef building.	NOAA FWS
Activity HMC-1.3: Where feasible, implement appropriate restoration activities.	NOAA FWS
Strategy HMC-2: Within 10 years, investigate, inventory and map sources of known contamination from historic human uses of the NWHI and, where appropriate, coordinate with responsible parties to develop plans and complete cleanup actions.	
Activity HMC-2.1: Evaluate effects of contamination in terrestrial and nearshore areas from shoreline dumps at French Frigate Shoals and at Kure, Midway, and Pearl and Hermes atolls and prioritize cleanup action based on risk assessments.	FWS
Activity HMC-2.2: Work with partners and responsible parties to verify the integrity of known landfills and dumps and to conduct additional remediation if necessary.	FWS
Activity HMC-2.3: Locate historic disposal sites at French Frigate Shoals and at Kure, Midway, and Pearl and Hermes atolls, and investigate them for contamination.	FWS
Activity HMC-2.4: Evaluate costs to ecosystem function and benefits of removing anthropogenic iron sources such as metal from shipwrecks and discarded debris from reefs throughout the Monument.	FWS
Activity HMC-2-5: Continue collection and fingerprinting of oil found washed ashore and on wildlife from mystery spills to determine its provenance, and build an oil sample archive for possible use as evidence in liability assignment.	FWS
Activity HMC-2-6: Continue monitoring the area at Laysan Island that was contaminated by the insecticide carbofuran.	FWS
Activity HMC-2.7: Conduct ecological risk assessment to determine allowable lead levels in soils at Midway and remove lead from buildings and soils to nonrisk levels.	FWS
Strategy HMC-3: Protect and restore beach strand and crest habitats over the life of the plan.	
Activity HMC-3.1: Evaluate loss of beach strand and crest due to erosion and sea level rise to aid in formulating a restoration plan that will stop as much net loss of beach strand and beach crest habitat as is possible.	FWS
Activity HMC-3.2: Inventory and map manmade structures and changes in natural beach and reef state that may influence erosion and depositional processes at all of the beach strand units of the Monument.	FWS

Strategies and Activities	Agency Lead
Strategy HMC-4: Within 10 years, restore and maintain coastal mixed grasses and shrubs on all the coralline islands and atolls of the Monument using best available historical information about the original indigenous ecosystem.	
Activity HMC-4.1: Propagate and outplant native species chosen on the basis of historical records at Midway and historical and pollen records from Laysan Island in 250 acres of vegetated area at Midway Atoll, focusing on the original footprint of the island and then moving to the dredge spoils section.	FWS
Activity HMC-4.2: Implement the Draft Laysan Island Restoration Plan by removing invasive plants, and propagating and outplanting all extant species identified in the pollen record or historical documents as formerly having occurred at Laysan.	FWS
Activity HMC-4.3: At Laysan Island, replace 60 acres of the introduced shrub Indian pluchea with native species.	FWS
Activity HMC-4.4: Formulate and implement a restoration plan for Lisianski Island using guidelines established for neighboring Laysan Island.	FWS
Activity HMC-4.5: Propagate and outplant native vegetation on 34-acre Southeast Island at Pearl and Hermes Atoll to replace native plant community extirpated by invasion of the alien plant golden crownbeard.	FWS
Activity HMC- 4.6: Implement coordinated ecosystem restoration activities on Kure Atoll.	State of Hawai'i
Activity HMC-4.7: Monitor changes in the species composition and structure of mixed grass and shrub plant communities at each site.	FWS
Strategy HMC-5: Within 10 years, restore and maintain coastal mixed grasses and shrublands on basalt islands in the Monument.	
Activity HMC-5.1: Inventory and document life histories of endemic terrestrial invertebrates at Nihoa and Mokumanamana.	FWS
Activity HMC-5.2: Monitor changes in species composition and structure of the coastal shrub and mixed grass communities on basalt islands throughout the life of the plan.	FWS
Strategy HMC-6: Maintain and better understand the Monument's wetland and mudflat habitats to benefit migratory shorebirds and waterfowl for the life of the plan.	
Activity HMC-6.1: Monitor water level, salinity, and other water quality parameters of Laysan Lake, and document any loss of lake area.	FWS
Activity HMC-6.2: As needed, restore dune habitat on Laysan Island to stabilize movement if lake loss starts to occur.	FWS
Strategy HMC-7: Maintain, enhance, and, where appropriate, develop freshwater seeps, intermittent streams, and freshwater ponds as necessary for the benefit of native species for the life of the plan.	
Activity HMC-7.1: Monitor salinity, parasites, contaminants, and native arthropods associated with freshwater seeps, ponds, and streams.	FWS
Activity HMC-7.2 Evaluate potential for development and create as needed additional freshwater sources at potential translocation sites of the Laysan duck, Nihoa finch, Laysan finch, and Nihoa millerbird.	FWS

Strategies and Activities	Agency Lead
Strategy HMC-8: Maintain no more than 150 acres of ironwood woodlands on Sand Island, Midway Atoll, to provide seabird nesting and roosting habitat for the life of the plan.	
Activity HMC-8.1: Remove ironwood on Sand Island from 50 acres outside designated woodland and control young ironwood in areas managed for grass and shrubs.	FWS
Activity HMC-8.2: Devise and implement methods for monitoring population size and reproductive success in tree-nesting seabird species.	FWS
Strategy HMC-9: Protect and maintain 120 acres of vertical rocky cliff-face habitat at Nihoa and Mokumanamana for nesting seabirds for the life of the plan.	
Activity HMC-9.1: Educate other federal and state agencies about overflight rules and promote compliance regarding overflights and close approaches.	FWS
Activity HMC-9.2: Develop and implement techniques for monitoring plant and animal populations on cliff habitats in the Monument within 10 years.	FWS

3.3 Reducing Threats to Monument Resources

3.3.1 Marine Debris Action Plan

3.3.2 Alien Species Action Plan

3.3.3 Maritime Transportation and Aviation Action Plan

3.3.4 Emergency Response and Natural Resource Damage Assessment Action Plan

3.3 Reducing Threats to Monument Resources

Situated in the middle of the Pacific Ocean at the fulcrum of the North Pacific gyre and the mid-point between the economic giants of the east and west, the NWHI are subject to the full range of environmental and anthropogenic stressors despite their remote location and the absence of human population. Many threats originate far outside the NWHI. Marine debris, largely consisting of discarded or lost fishing nets from distant fleets and plastic trash, threatens and damages coral reef and coastal habitats, entangles and chokes marine life, and aids in the transport of contaminants.

The introduction of alien species to the islands has led to the establishment of invasive species that crowd out native species, altering habitat and food webs. Alien species may arrive on vessels or debris of any kind from ports around the world. Discharges from vessels operating in or transiting the NWHI can introduce pathogens that contribute to coral disease and could threaten marine mammal populations.

Vessel groundings and cargo spills occur somewhat infrequently in this remote archipelago, and response to such emergencies has required exceptional collaborative interagency effort and resources to minimize effects to the fragile coral reef and terrestrial ecosystems.

Through an ecosystem-based approach to management, of which interagency coordination and cooperation are central, reducing threats to the ecosystem is achieved through an effective regulatory framework, education and outreach, preventative measures to minimize risk, emergency response, and natural resource damage assessment and restoration when unforeseen events cause injury to natural resources.

Action plans to reduce existing and potential threats and prevent impacts to the ecosystem focus on developing and implementing risk reduction assessment and protocols, emergency response plans, and alien species prevention and eradication, where feasible. Each action plan consists of a set of strategies to address a desired outcome. The desired outcomes of these action plans over the 15-year planning horizon are:

- **Marine Debris:** Reduce the adverse effects of marine debris to Papahānaumokuākea Marine National Monument resources and reduce the amount of debris entering the North Pacific Ocean.
- **Alien Species:** Detect, control, eradicate where possible, and prevent the introduction of alien species into Papahānaumokuākea Marine National Monument.
- **Maritime Transportation and Aviation:** Investigate, identify, and reduce potential threats to Papahānaumokuākea Marine National Monument from maritime and aviation traffic.
- **Emergency Response and Natural Resource Damage Assessment:** Minimize damage to Papahānaumokuākea Marine National Monument resources through coordinated emergency response and assessment.

Action plans described in this section will be implemented in close coordination with agency partners and in conjunction with other priority management needs.

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3.3.1 Marine Debris Action Plan

Desired Outcome

Reduce the adverse effects of marine debris to Papahānaumokuākea Marine National Monument resources and reduce the amount of debris entering the North Pacific Ocean.

Links to other Action Plans	
3.2.1	Threatened and Endangered Species
3.2.3	Habitat Management and Conservation
3.3.2	Alien Species
3.3.4	Emergency Response
3.5.1	Agency Coordination
3.5.4	Ocean Ecosystems Literacy
3.6.3	Coordinated Field Operations

Current Status and Background

In 1982 annual net and line removal began along NWHI beaches. A multiagency effort launched in 1996 strengthened and expanded efforts to address the problem of marine debris, a problem that was much larger than any agency alone might resolve. An estimated 750 to 1,000 tons of marine debris were on reefs and beaches in the NWHI. NOAA, in collaboration with 14 other partners, including the Coast Guard, Schnitzer Steel Hawai‘i Corporation (formerly Hawai‘i Metals Recycling Company), the Sea Grant College Program, the U.S. Navy, FWS, the City and County of Honolulu, the State of Hawai‘i, The Ocean Conservancy, Hawai‘i Wildlife Fund, Matson Navigation Company, and others removed 66 tons of marine debris and derelict fishing gear from 1996 to 2000.

Links to Goals
Goal 1
Goal 2
Goal 3

In 2001, the multiagency cleanup effort was extended, and yields grew from approximately 25 tons per year in 1999 and 2000 to 68 tons in 2001, 107 tons in 2002, 118 tons in 2003, 126 tons in 2004, 57 tons in 2005, 21 tons in 2006, and 19 tons in 2007. The total amount of marine debris removed from 1996 to 2007 was 582 tons. The 2006 field season marked the first year of the maintenance mode effort, in which specific study areas called “High Entanglement Risk Zones” for Hawaiian monk seals are cleaned and designated accumulation rate zones are studied. Based on a recent study, the accumulation of new debris in the NWHI is now estimated to be 57 tons (or 52 metric tons) annually (Dameron et al. 2007). Even if all new input of debris were stopped, existing debris in the ocean would continue to accumulate in the NWHI for years to come.



Pacific Island Fisheries Science Center, Coral Reef Ecosystem Division's marine debris removal team at work in the NWHI. Photo: Jake Asher

In 2005, with guidance from Congress, a Marine Debris Program was established under NOAA’s Office of Response and Restoration. This program is undertaking a national and international effort focused on identifying, removing, reducing, and preventing debris in the marine environment. This program is a significant step toward addressing the marine debris issue and

providing much-needed support to projects that address the issue. As one example, a project funded in 2005 established a port reception facility and derelict net recycling program in Honolulu for proper disposal of derelict fishing gear. Also in 2005, the Marine Debris Program joined the multiagency cleanup effort through funding for debris removal field operations.

On December 22, 2006, the Marine Debris Research, Prevention, and Reduction Act was signed into law. The Act makes the Marine Debris Program permanent and directs NOAA to work in conjunction with federal agencies such as EPA and the Coast Guard to identify the origin, location, and projected movement of marine debris within navigable waters of the United States and the U.S. exclusive economic zone. The Act specifically targets fishing gear as a threat to the marine environment and navigation safety, authorizes the research and development of alternative types of fishing gear, and allows the use of voluntary incentives to promote recovery of lost or discarded gear. The Act also authorizes NOAA to offer grants to academia, nonprofit organizations, commercial organizations, and state, local, or tribal governments to identify, assess, reduce, and prevent marine debris.

In recognition of the magnitude of the marine debris problem, NOAA has contributed to mitigating the effects of marine debris by providing funding for debris removal efforts and participating in the NWHI multiagency partnership. This work will now continue through the establishment of the Monument, and the MMB is already working to increase awareness of this very serious threat to coral reef ecosystems through national and international documentaries and publications, public outreach displays at Mokupāpapa Discovery Center, development of lesson plans about marine debris in the Navigating Change Teacher's Guide, and community presentations.

Need for Action

Marine debris, especially derelict fishing gear, is a severe chronic threat to the shallow-water ecosystems of the NWHI and hinders the recovery of the endangered Hawaiian monk seal and threatened sea turtles through ingestion of debris and entanglement, which can lead to drowning and suffocation (see Section 3.2.1, the Threatened and Endangered Species Action Plan). Ocean currents carry marine debris, including derelict fishing nets and other gear from North Pacific fisheries, plastics, hazardous materials and hazardous waste lost or discarded from ships during transit, authorized and unauthorized fish aggregation devices (Donohue 2005), and other shore-based debris from Pacific Rim countries, across the greater Pacific Ocean. The North Pacific Subtropical Convergence Zone, located just north of the Hawaiian Archipelago, concentrates some of these materials. Under certain conditions, such as during an El Niño event, this convergence zone dips southward and straddles the Hawaiian Archipelago, depositing much higher volumes of debris on the island chain than in years when these conditions are not in effect (Harrison and Craig 1993; Matsumura and Nasu 1997; Ingraham and Ebbesmeyer 2001; Donohue and Foley 2007; Morishige et al. 2007).

Large conglomerations of derelict fishing nets that are carried into shallow waters degrade reef health by shading, abrading, smothering, and dislodging fragile corals and other benthic organisms and by preventing recruitment on reef surfaces (Donahue and Brainard 2001). Nets and line pose deadly entanglement hazards for all marine life. Smaller marine debris, such as disposable lighters and plastic bottle caps, are ingested by albatrosses while foraging for food

and affect survival rates of these birds. Marine debris washes ashore in the NWHI, degrading habitat and the health of the Monument's ecosystems. Debris in the form of hazardous materials, unknown substances, and unexploded ordnance endangers wildlife as well as Monument field staff. Marine debris also acts as a vector for the accelerated introduction of alien species into the region and poses a navigational hazard to maritime vessels (see Sections 3.3.2 and 3.3.4, the Alien Species and Emergency Response and Natural Resource Damage Assessment action plans). This action plan presents strategies and activities for addressing marine debris issues in the Monument as well as the North Pacific region.

Strategies to Achieve the Desired Outcome

Ultimately, the Monument's desired outcome is the elimination of marine debris, including derelict fishing gear, from the NWHI. Complete elimination of marine debris in the near future is virtually impossible because of the financial cost, the size of the area, and the continuous influx of new debris. However, removal of existing debris, detection and prevention of incoming debris, and education to prevent future generations of debris are the achievable strategies to reduce the overall impact of debris. Three strategies have been developed to achieve the desired outcome. The strategies and activities are coded by the acronym for the action plan title, "Marine Debris" (MD). A summary of strategies and activities is provided in Table 3.3.1 at the end of this action plan.

- MD-1: Remove and prevent marine debris throughout the life of the plan.
- MD-2: Investigate the sources, types, and accumulation rates of marine debris within 5 years.
- MD-3: Develop outreach materials regarding marine debris within 2 years.

Strategy MD-1: Remove and prevent marine debris throughout the life of the plan.

Continued support of existing debris removal programs, including the Marine Debris Program, is essential. Existing debris, particularly large fishing nets, poses an acute entanglement threat to endangered and threatened species. The only way to decrease entanglement rates from existing debris is to remove the nets from beaches and the nearshore areas, including those around French Frigate Shoals, Maro Reef, Lisianski Island, Laysan Island, Pearl and Hermes Atoll, Midway Atoll, and Kure Atoll. Nets and other debris also combine into large masses that are moved around by wave energy. These masses scour the bottom, abrading and breaking coral colonies, preventing colonization, and damaging other benthic resources. Removal of debris, particularly large nets that have come into shallow waters, is expensive and dangerous. Programs to identify, track, and remove nets both within and outside the Monument, combined with incentive programs for fishermen to pick up these nets and bring them back to shore for disposal, may be more cost effective and would prevent damage to fragile reef ecosystems. The MMB will work in partnership with the Coast Guard and other marine debris partners to provide incentives for fishing vessels to participate in disposal programs and still comply with Coast Guard policies regarding the transport of debris as "cargo-for-hire."

Activity MD-1.1: Continue working with partners to remove marine debris in the Monument and reduce additional debris entering the Monument.

The MMB will continue to support and participate in the multiagency cleanup effort that has been highly effective in removing marine debris from shallow-water areas and beaches. With existing infrastructure, protocols, and experience in executing this demanding and logistically intensive task, it is beneficial to all parties to continue participating in the existing effort. Data collected and analyzed as part of the multiagency effort will be entered into the Papahānaumokuākea Information Management System (PIMS), once it is developed.

Although cleanup efforts have removed the majority of accumulated large nets in NWHI waters less than 30 feet (9 meters) deep, additional debris keeps coming in. NOAA estimates that, each year, 57 tons (52 metric tons) of derelict fishing gear and other netting originating from outside the U.S. accumulates on coral reefs and beaches in the NWHI (Dameron et al. 2007). Two ways to prevent debris from entering the shallow-water reef ecosystem are to retrieve the existing debris at sea and to change existing fishing gear disposal practices. Potential changes include designing gear modifications, implementing gear loss reporting requirements, requiring permanent identification of fishing gear, requiring dockside gear accountability inspections of vessels prior to their departure on fishing trips and upon their return, working with the fishery management councils in the United States and similar agencies in foreign countries to reduce illegal fishing and destructive fishing practices, and pursuing technological means to detect and retrieve gear lost at sea.

Activity MD-1.2: Catalog, secure, contain, and properly remove hazardous materials that wash ashore in the NWHI.

Unidentified chemical containers, unexploded ordnance, oceanographic instruments, loose fish aggregating devices, and other unidentified objects regularly wash up on beaches in the Monument. The items will be documented, identified, and then secured until appropriate removal and disposal by approved contractors can occur.

Activity MD-1.3: Develop and implement a 5-year marine debris removal and prevention strategy for the Monument.

Using recommendations from national and international marine debris conferences and data from ongoing marine debris removal efforts, and in coordination with partner agencies and organizations, a coordinated strategy for marine debris removal and prevention will be developed for the NWHI. Data and information on the types, sources, locations, and impacts of debris obtained from ongoing removal efforts and additional studies will be used to develop focused, short-term and long-term initiatives geared to achieve the greatest return on investment in terms of ecological protection. The MMB will continue to pursue activities that identify, track, and collect large debris at sea, along with development of incentive programs for fishing vessels to collect debris at sea and bring it to dockside collection facilities. A dockside collection program has been implemented on O‘ahu for fishermen to offload derelict fishing gear retrieved at sea. This program illustrates the type of coordination among multiple government agencies, community groups, and the private sector needed to address this issue. The marine debris removal and prevention strategy will investigate this mechanism to provide additional incentive for debris prevention.

Activity MD-1.4: Work with the U.S. Department of State to gain international cooperation and involvement for marine debris issues.

The MMB will work through the Interagency Marine Debris Coordinating Committee, the U.S. Department of State, and other appropriate U.S. agencies to call international attention to marine debris problems in the NWHI and to identify approaches to reducing foreign debris sources. Approaches may include, but are not limited to, permanent identification of fishing gear, incentive programs for recovered debris, and dockside gear accountability inspections of vessels prior to their departure on fishing trips and on their return.

Activity MD-1.5: Work with the fishery management councils to address marine debris prevention with U.S. fishing fleets.

The MMB will work with the Western Pacific and North Pacific Fishery Management Councils to assess and address fishing practices or domestic fishing gear that contribute to the marine debris problem. The MMB will coordinate with the Councils to initiate an accountability requirement for all vessels that use the type of gear that is contributing to marine debris in the NWHI. This requirement could include permanent identification of fishing gear, incentive programs for recovered debris, disposal and recycling programs, dockside gear accountability inspections of vessels prior to their departure on fishing trips and on their return, and other approaches.

Strategy MD-2: Investigate the sources, types, and accumulation rates of marine debris within 5 years.

The MMB, in partnership with other governmental and nongovernmental entities, will conduct research into mechanisms to locate, track, and remove debris at sea before it reaches fragile Monument ecosystems. This program will attempt to use unmanned aircraft systems to locate the debris at sea and may also take advantage of remote sensing systems being researched for Monument enforcement purposes to detect large debris conglomerates. Once an area of high concentration of debris is located, unmanned aircraft can be launched from vessels to find individual conglomerations of debris and target removal efforts. These initiatives will help direct the cleanup effort to where it will have the greatest effect, with limited resources. Using satellite imagery, NMFS is also working with partners to design a statistical survey to census marine debris in the north Pacific. This information will provide us with an estimate of the magnitude of the marine debris problem in the Pacific. In addition, NMFS and its partners are working to track debris movement in the Pacific Ocean, including areas within the Monument, through the use of satellite-tracked drifter buoys.

Another project is to address the small plastic debris being fed to young albatrosses. Much of the debris being fed to young albatross is picked up at sea by the adults. Monitoring the debris that washes up onto the beaches at Midway Atoll will provide a snapshot of what is in the waters surrounding the Monument islands, the most economical approach to such identification. This study will also allow us to begin to identify sources of the debris and then to develop a strategy for use of this information for prevention through education and outreach targeting key stakeholders and user-groups that are associated with the behaviors that produce these forms of marine debris.

Activity MD-2.1: Work with partners on marine debris studies.

The MMB will work with the Marine Debris Program to support studies on the marine debris issue, including research to quantify resource impacts and to determine marine debris accumulation rates, biological and ecological impacts, efforts to track sources and types of debris, and documentation of the cost estimates of damage. One such study, implemented in August 2008, will assess resource impacts from nets found on corals and the recovery of net-scars over time at Midway Atoll reefs.

Activity MD-2.2: Develop and standardize marine debris monitoring protocols for marine and terrestrial habitats.

Currently, marine debris data are collected by numerous entities using a variety of data collection methods. Synthesizing, quantifying, and interpreting marine debris data are therefore difficult. The MMB will work with all federal and state partners to standardize protocols to maximize the use and utility of data collected by the various programs. Development of a statistically sound and biologically relevant marine debris monitoring protocol for Midway Atoll has begun. This protocol may serve as the basis for a long-term monitoring program within the Monument. Since 1984, 22 international marine debris conferences have recommended standardization of data collection as one of their top two priorities. This unique project at Midway Atoll, in partnership with the Dow Chemical Company and with additional funding from a National Fish and Wildlife Foundation grant, hopes to lay the foundation for a greater understanding of debris sources.

Strategy MD-3: Develop outreach materials regarding marine debris within 2 years.

To better explain the scope and impacts of marine debris in the NWHI, an outreach strategy will be developed with the multiagency partnership to reach both local and international audiences and specific fishing communities.

Activity MD-3.1: Work with partners to continue to develop and implement an outreach strategy for marine debris.

To better explain the scope and impacts of marine debris in the NWHI, an outreach strategy will be developed with the multiagency partnership to reach a broad audience and specific fishing communities. Such outreach will be coordinated with other efforts as described in the Constituency Building and Outreach Action Plan (Section 3.5.2) as well as with broader efforts of the Marine Debris Program.

Awareness of the impact of marine debris must be increased. Most people are not aware that much of the shore-based marine debris comes from the careless disposal of garbage, such as cigarette lighters and other plastics, and that much of the derelict fishing gear comes from losses at sea caused by bad weather, gear failure, and improper disposal. Educating the public about the impacts of this debris in the ocean environment aims to change behaviors and ultimately reduce the volume of debris in the ocean. Documentaries and feature stories regarding this issue already have led to significant actions by several nations aimed at reducing marine debris. Such educational activities will be encouraged by the MMB. In addition, outreach products will be developed to reach specific fishing communities and industries. These materials will target recreational fishermen and commercial fishing sectors on proper disposal and reporting of gear lost at sea. The outreach materials will highlight lost gear to better explain the scope and impacts of this type of marine debris.

Table 3.3.1 Summary of Strategies, Activities, and Agency Leads for Marine Debris

Strategies and Activities	Agency Lead
Strategy MD-1: Remove and prevent marine debris throughout the life of the plan.	
Activity MD-1.1: Continue working with partners to remove marine debris in the Monument and reduce additional debris entering the Monument.	NOAA
Activity MD-1.2: Catalog, secure, contain, and properly remove hazardous materials that wash ashore in the NWHI.	FWS
Activity MD-1.3: Develop and implement a 5-year marine debris removal and prevention strategy for the Monument.	NOAA
Activity MD-1.4: Work with the U.S. Department of State to gain international cooperation and involvement for marine debris issues.	NOAA
Activity MD-1.5: Work with the fishery management councils to address marine debris prevention with U.S. fishing fleets.	NOAA
Strategy MD-2: Investigate the sources, types, and accumulation rates of marine debris within 5 years.	
Activity MD-2.1: Work with partners on marine debris studies.	NOAA
Activity MD-2.2: Develop and standardize marine debris monitoring protocols for marine and terrestrial habitats.	NOAA
Strategy MD-3: Develop outreach materials regarding marine debris within 2 years.	
Activity MD-3.1: Work with partners to continue to develop and implement an outreach strategy for marine debris.	NOAA

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3.3.2 Alien Species Action Plan

Desired Outcome

Detect, control, eradicate where possible, and prevent the introduction of alien species into Papahānaumokuākea Marine National Monument.

Current Status and Background

Despite the extreme remoteness of the Monument, the relatively low rate of visitation, and the high amount of administrative control over the conditions of any visits, alien species have left their mark on natural communities in the Monument. Insular ecosystems are often more vulnerable to the effects of introduced species than continental areas due to smaller total population sizes, higher endemism, and species that have evolved longer in the absence of predators and thus are less likely to have developed defenses against them (Blackburn et al. 2004). An invasive species is defined as a species (1) that is nonnative (or alien) to the ecosystem under consideration, and (2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health (Executive Order 13112). Invasive species can affect native species by competitive exclusion, niche displacement, hybridization, introgression, predation, and ultimately extinction (Mooney and Cleland 2001). The known incidence and distribution of alien species in the NWHI is described in Section 1.4, Environmental and Anthropogenic Stressors.

The ecosystems of Hawai‘i have changed profoundly and at an accelerating pace since humans arrived, accompanied by an array of alien species. The NWHI now have terrestrial invaders in most taxa, some of which have caused great disruption to the native ecosystems. In the main Hawaiian Islands, alien algae have altered native habitat and in some areas have overgrown and completely smothered extensive areas of coral reef (DLNR 2003a). Other alien species have caused serious economic effects. Each year, Maui County spends thousands of dollars to remove more than a million pounds of the alien algae *Hypnea* from its beaches (Coloma-Agaran 2003). Snowflake coral (*Carijoa riisei*) has covered significant portions of black coral beds in the main Hawaiian Islands in depths greater than 250 feet (75 meters) and is now considered one of the most invasive invertebrates on deep-water coral reefs (DLNR 2003a). Hawai‘i’s harbors and bays are the most common sites for alien species introductions (Godwin et al. 2006).

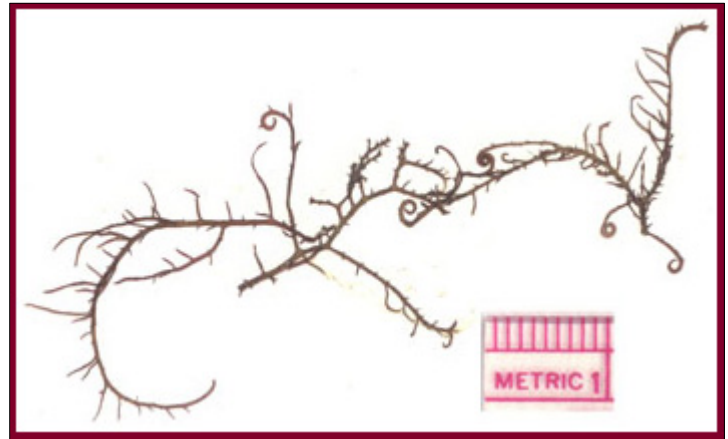
In 2003, the State of Hawai‘i DLNR and various federal, state, industry, and nonprofit organizations released the State of Hawai‘i Aquatic Invasive Species Management Plan (DLNR 2003a). Many of the strategies outlined in that plan complement those outlined in this action plan but are much broader in scope, as they concern the entire archipelago, including the complexities of the highly populated and commercially active main Hawaiian Islands. An assessment of the potential threats of nonindigenous marine species in the NWHI was completed by Eldredge (2005). A 2006 report by HIMB addresses issues specific to reducing the potential impacts of invasive marine species in the NWHI (Godwin et al. 2006).

Links to other Action Plans	
3.1.1	Marine Conservation Science
3.2.1	Threatened and Endangered Species
3.2.3	Habitat Management and Conservation
3.3.1	Marine Debris
3.3.3	Maritime Transportation and Aviation
3.4.1	Permitting
3.4.2	Enforcement
3.5.2	Constituency Building and Outreach
3.5.4	Ocean Ecosystems Literacy
3.6.2	Information Management
3.6.3	Coordinated Field Operations

Links to Goals
Goal 1
Goal 2
Goal 3
Goal 4
Goal 5

Early attempts to establish human settlements in the NWHI in the late 1800s and early 1900s, especially at Laysan Island and Midway Atoll, resulted in the introduction of many alien terrestrial species, including plants, insects, and mammals. The number of alien land plants in the NWHI varies from only three introduced at Nihoa to 249 introduced at Midway Atoll. The level of threat from introduced plants also varies between species. For example, the invasive plant golden crownbeard (*Verbesina encelioides*) displaces all native vegetation in nesting areas, causing entanglement and heat prostration and killing hundreds of albatrosses each year. The invasive gray bird locust (*Schistocerca nitens*) was first detected at Nihoa in 1984 and by 2000 was periodically reaching population levels large enough to cause damage to the native plant community, including three endemic species listed as endangered. This grasshopper species has now also spread to Mokumanamana, French Frigate Shoals, and Lisianski Island. To prevent further importation of invasive plants, animals, or insects, mandatory quarantine protocols are enforced for any visitors to all the islands in the NWHI (with the exception of Midway Atoll and French Frigate Shoals). These protocols require the use of brand new or island-specific gear at each site and treatments such as cleaning, using insecticide, and freezing to minimize the transport of potentially invasive species to the island.

Of the 343 marine alien species found in the Main Hawaiian Islands, a total of 13 alien marine invertebrate, fish, and algal species have been recorded in the NWHI, with the highest concentrations occurring at Midway Atoll (see Table 1.1, and also Eldredge and Carlton 2002; Godwin et al 2006). The location, source, and year of each confirmed sighting are contained in the Monument's geodatabase. Several patterns have emerged through analyses of these data: (1) of the three alien fish species in the Monument, ta'ape (*Lutjanus kasmira*) has spread significantly farther and is more abundant than either to'au (*Lutjanus fulvus*) or roi (*Cephalopholis argus*); (2) aside from the Christmas tree hydroid (*Pennaria disticha*), invasive invertebrates are concentrated in the harbors of Midway Atoll and Tern Island in French Frigate Shoals. Invasive invertebrates commonly thrive in harbors, benefiting from anthropogenic structures, such as pier pilings and seawalls, as well as protection from wave action; (3) alien algae have not yet spread far into the Monument. *Hypnea musciformis* has been found only on lobster traps retrieved near Mokumanamana (Godwin et al. 2006).



Hypnea musciformis, an alien algae species which is invasive in the main Hawaiian Islands, has been documented in the waters surrounding Mokumanamana. Photo W.H. Magruder (Bishop Museum)

Although the remoteness and relative inaccessibility of the NWHI have helped to prevent the introduction of some alien species to the area, these islands are vulnerable to introductions through a variety of human activities. Maritime vessels are recognized as the primary vector for transporting marine alien species through contaminated vessel equipment, hull fouling, ballast water, and ballast sediment. Additional vectors include deliberate and accidental release and transport by artificial substrates such as fish attractant devices and marine debris (See Section

3.3.1, the Marine Debris Action Plan, and also Godwin et al. 2006.). Analyses are currently being conducted of the algal and invertebrate communities living on derelict nets collected during the 2007 marine debris removal effort. This information will provide needed insight on the quantity and diversity of alien biota living on the nets and facilitate the assessment of this threat to the ecosystems of the NWHI.

Existing Laws, Regulations, and Protocols

Vessel hull fouling and ballast water discharge have been identified as two major vectors for transporting alien species in marine environments (International Maritime Organization 1997, 2001). Therefore, Monument regulations and permit requirements specifically target these pathways. Best management practices for Monument access will continue to use the latest information to address both marine and terrestrial alien species introductions and support the requirements developed by FWS to prevent alien species introductions to the Hawaiian Islands NWR (see Section 3.4.1, the Permitting Action Plan, and Appendix A).

In 2000, the State of Hawai‘i Legislature designated DLNR as the lead agency for preventing the introduction of alien aquatic organisms through ballast water and hull fouling. DLNR reestablished an interagency task force to discuss and make recommendations to address concerns about alien aquatic organism issues related to ballast water and hull fouling, including adopting administrative rules and penalties. DLNR has hired a project coordinator to address issues relating to aquatic invasive species through hull fouling and ballast water. The State of Hawai‘i has also been working on developing a comprehensive ballast water and hull fouling program since September 2002, with NOAA funds administered by the State Office of Planning, Coastal Zone Management Program.

Federal laws that apply in addressing alien species and invasive species in the NWHI include the Lacey Act of 1900, as amended (18 U.S.C. 42, 16 U.S.C. 3371), the Endangered Species Act of 1973, the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4701), and the National Invasive Species Act of 1996 (Public Law 104-332); Executive Order 13112 on Invasive Species (1999) also applies. Executive Order 13112 established the National Invasive Species Council and requires development of a National Management Plan for Invasive Species. Under the Nonindigenous Aquatic Nuisance Prevention and Control Act, NOAA and FWS have responsibility for control and management of invasive aquatic species.

The Coast Guard has developed the Mandatory Ballast Water Management Program for U.S. Waters. The Coast Guard published regulations on July 28, 2004, establishing a national mandatory ballast water management program for all vessels equipped with ballast water tanks that enter or operate within U.S. waters. These regulations also require each vessel to maintain a ballast water management plan that is specific to that vessel and assigns responsibility to the master or another appropriate official to understand and execute the ballast water management strategy for that vessel. The International Maritime Organization (1997) has developed ballast water exchange guidelines. In Hawai‘i, the Alien Aquatic Organisms Task Force is also developing strategies to address the transport of alien species by vessels. DLNR promulgated Title 13, Chapter 76, Hawaii Administrative Rules (Non-indigenous Aquatic Species) on October 12, 2007, to manage ballast water discharge from vessels operating in Hawai‘i waters (Appendix F). They are consistent with and complement the federal regulations and coincide

with the national focus to protect U.S. water in which many states have adopted their own rules.

The MMB incorporated FWS policies aimed primarily at preventing the introduction of terrestrial alien species to the islands in the Hawaiian Islands NWR (Appendix F). These policies include requiring personnel and other visitors to use new, island-specific clothing, shoes, and other gear, such as tents and bedding, that have been frozen for at least 48 hours and carefully packed to prevent contamination at all islands with the exception of Midway Atoll and French Frigate Shoals. In addition, considerable resources and staff time are devoted to controlling and eradicating invasive species on the islands. The eradication of the introduced grass *Cenchrus echinatus* at Laysan Island is an example of the success the FWS has had in its prevention and eradication programs (Rehkemper and Flint 2002). The MMB has also taken steps toward preventing marine alien species introductions through the development of protocols for reducing the risk of transmission from vessel hulls, discharge, and equipment used throughout the Monument (Appendix F).

Monument Regulations and Permit Requirements

Preventing alien species from entering the NWHI ecosystem is the most important action to take in protecting the ecosystem from the impacts of invasive species. It is difficult, if not impossible, to predict whether an alien species will become invasive in a given environment. The probability of a successful eradication of an alien species in the marine environment is low. Therefore, efforts will be made to prevent all alien species from entering NWHI ecosystems. Monument regulations and permit requirements (based on best management practices) related to alien species target key vectors known for transporting alien species. Monument regulations related to preventing alien species introductions include a prohibition of the release or introduction of alien species into the Monument, and the State regulates any kind of vessel discharge (see Appendix F; HAR Title 13 Chapter 76). Mandatory hull inspections and cleaning, if needed, are a Monument permit requirement for all ships authorized to enter the Monument. In addition, aircraft landing within the Monument are subject to inspection, as are all visitors and their luggage.

In addition to regulations and permit conditions, outreach programs offer tools for enlisting the support of Monument permittees in protecting ecological integrity. (See also the action plans for Permitting, Section 3.4.1; Ocean Ecosystems Literacy, Section 3.5.4; Constituency Building and Outreach, Section 3.5.2; and Marine Transportation and Aviation, Section 3.3.3.)

Need for Action

Worldwide, invasive species are causing negative ecological and economic impacts. While not all alien species will become invasive in a given environment, it is difficult, if not impossible, to determine which will have harmful impacts. Therefore, a precautionary approach treats all alien species as potentially invasive other than a select few that have been cleared for human consumption. The need to prevent introductions of both marine and terrestrial alien species to the NWHI was raised as an issue of concern during public scoping meetings in 2002 and consistently during public scoping and comment periods since that time. Protecting the lands and waters of the NWHI from the impacts of alien species is critical to achieving the Monument's primary goal of resource protection.

While few alien species are established in the waters of the NWHI, global trends suggest that others could be introduced to this relatively pristine ecosystem. For example, marine debris serves as a vector for invasive species by providing a ride for sessile aliens and a microhabitat for other species that may arrive unattached but associated with the debris. By causing mechanical damage to reef structures, it may also create favorable habitat for settling out and recruitment of nonnative species. Once established, invasive species can be extremely costly to control and would likely be impossible to eradicate. The remoteness of this area compounds the challenge. If appropriate prevention and control measures are not taken, alien species could continue to spread and may cause substantial damage to the health and integrity of marine ecosystems across the Hawaiian Archipelago. This action plan presents strategies and activities for addressing alien species needs in the Monument, as well as the NWHI region.

Strategies to Achieve the Desired Outcome

Strategies identified for achieving the desired outcomes range from preventing alien species introductions to monitoring, controlling, and eradicating existing alien species in the Monument, to detecting new invasive species threats. The strategies and activities are coded by the acronym for the action plan title, “Alien Species” (AS). A summary of strategies and activities is provided in Table 3.3.2 at the end of this action plan.

- AS-1: Conduct planning to prioritize by threat level, invasiveness, and practicality of eradication or control all nonnative organisms in the Monument over the life of the plan.
- AS-2: Engage in active surveillance to monitor existing infestations and to detect new infestations of alien species over the life of the plan.
- AS-3: Establish and enforce quarantine procedures appropriate for each site and habitat (terrestrial and aquatic) in the Monument to prevent the invasion or reinfestation of nonindigenous species over the life of the plan.
- AS-4: Eradicate the house mouse population on Sand Island, Midway Atoll, within 15 years.
- AS-5: Prioritize infestations of alien terrestrial arthropods by species and locations and, within 5 years, develop and subsequently implement plans to control and if possible eradicate the highest-priority species.
- AS-6: Control and eventually eradicate the highest-priority invasive plants in the terrestrial parts of the Monument within 15 years.
- AS-7: Investigate methods to eventually eradicate aquatic invasive organisms already known to be present in the Monument, and conduct regular surveillance for new invasions.
- AS-8: Conduct and facilitate research designed to answer questions regarding invasive species detection; effects on ecosystem; and alien species prevention, control, and eradication over the life of the plan.
- AS-9: Engage Monument users and the public in preventing the introduction and spread of alien species.
- AS-10: Participate in statewide and Pacific regional alien species efforts.

Strategy AS-1: Conduct planning to prioritize by threat level, invasiveness, and practicality of eradication or control all nonnative organisms in the Monument over the life of the plan.

The consolidation of efforts and information and the standardization of methods for approaching invasive species problems will enable managers to prioritize invasive species projects, maintain better readiness to respond to new invasions, and prevent or reduce the probability of additional invasions.

Activity AS-1.1: Complete an Integrated Alien Species Management plan.

An Integrated Alien Species Management Plan (IASMP) for the Monument will be developed based on review of the effectiveness of existing protocols and a critical geospatial threat analysis of alien species found within the NWHI and risks associated with new introductions from maritime traffic from the main Hawaiian Islands and interisland travel by aircraft or vessel. The plan will be based on a comprehensive risk assessment and enable prioritization of alien species management actions. Any necessary pesticide use proposals and Section 7 consultations will address terrestrial alien species control, eradication, and response to outbreaks within two years. The IASMP and associated compliance requirements will be updated every 5 years and will include proactive components such as completing pesticide use proposals and Section 7 consultations before they are needed to facilitate rapid response.

Activity AS-1.2: Develop best management practices to prevent, control, and eradicate alien species.

The integrated alien species management plan will include a definition of specific protocols and requirements for preventing, controlling the spread of, and eradicating alien species, such as hull inspections and island quarantine protocols, a description of each partner's role in alien species control, best management practices to prevent the spread of species within the NWHI, and priority areas. Species of concern will be identified. One concern the plan will address is the need to prevent the spread of alien species within the NWHI, especially from Midway Atoll.

The plan will incorporate individual Co-Trustee guidelines, as appropriate, for the most effective and collaborative efforts possible. Memoranda of agreement will be developed as necessary to adopt and implement agency guidelines. Planning may also include development of a formal inter-agency rapid-response field team modeled after similar efforts for brown tree snakes, the state terrestrial and aquatic alien invasive species (AIS) response teams, oil-spill response teams, and the Federal Incident Command System. A rapid response plan that details complete areas of responsibilities for each managing partner on the discovery of a new introduction needs to be a part of the plan.

This plan will include strategies for a rapid risk assessment, possible methods for containment and eradication, and a provision for quickly accessing funding needed for the control or eradication attempt. Additionally, measures to reduce the chances that ships are transporting deleterious species should be encouraged even if no ballast water is intentionally discharged in the Monument. These measures may include exchange; pre-intake treatments such as filtration, ultraviolet treatment, or sonic treatment; post-intake extermination of organisms; and regular cleaning of ballast tanks. Coordination with existing groups already working on some of these alien species issues will be a high priority to build on the plans already drafted. Examples of these are the State of Hawai'i Aquatic Invasive Species Management Plan (DLNR 2003a), the report on Reducing Potential Impact of Invasive Marine Species in the NWHI CRER (Godwin et

al. 2006), the Assessment of the Potential Threat of Marine Nonindigenous Species in the NWHI (Eldredge 2005), the Draft Pacific Islands Rat Spill Contingency Plan (FWS in prep.), and the Draft Laysan Island Restoration Plan (Morin and Conant 1998). This activity will be closely linked with the field protocols developed in the Coordinated Field Operation Action Plan (Section 3.6.3) and in the Maritime Transportation and Aviation Action Plan (Section 3.3.3).

Strategy AS-2: Engage in active surveillance to monitor existing infestations and to detect new infestations of alien species over the life of the plan.

The two pressing needs in managing areas affected by invasive species are to identify what new species have recently arrived and become established and which alien species exhibit invasive characteristics and are, therefore, the most dangerous. Maintaining careful records of the distribution of known alien species and actively searching for new arrivals are essential to correctly prioritize response and restoration activities.

Activity AS-2.1: Survey distributions and populations of known alien species at regular intervals.

Existing invasions should be closely monitored to determine their rate of spread and distribution relative to sensitive native species in the Monument. This will assist managers in prioritizing response actions. Monument staff will incorporate alien species data collection into existing annual ecosystem monitoring activities (see Section 3.1.1, Marine Conservation Science Action Plan).

Activity AS-2.2: Maintain a GIS database of marine and terrestrial alien species.

Data collected during alien species monitoring will be added to the Monument's geographic information system (GIS) database for tracking and analysis purposes (see Section 3.6.2, Information Management Action Plan). These data will help track the spread of invasive species and the success of control measures instituted by Monument managers.

Activity AS-2.3: Develop and implement monitoring protocols for early detection and characterization of new infestations.

In accordance with the Monument's integrated alien species management plan, protocols will be developed and refined as necessary to monitor selected areas for possible alien species introduction. Discoveries of new alien species will be immediately reported to managers for appropriate response and incorporated into the Monument's GIS database.

Strategy AS-3: Establish and enforce quarantine procedures appropriate for each site and habitat (terrestrial and aquatic) in the Monument to prevent the invasion or reinfestation of nonindigenous species over the life of the plan.

The benefits of preventing the introduction of a new species far outweigh its cost. Reducing the probability of alien species being transported to the Monument by developing effective quarantine protocols and enforcing them is tremendously important to maintain the biological integrity, diversity, and environmental health of the system.

Activity AS-3.1: Enforce the use of existing quarantine protocols to prevent the introduction of invasive terrestrial species to the Monument.

Strict enforcement of existing policies (see Appendix F) requiring the use of island-specific soft gear that is brand new and has been frozen for 48 hours has resulted in a very low incidence of new invasive species being reported in the NWHI since the inception of the current program in 1991 at all high-quarantine sites (Nihoa, Mokumanamana, Gardner Pinnacles, Laysan Island, Lisianski Island, and Pearl and Hermes Atoll).

Activity AS-3.2: Continue to require hull inspection and cleaning of all vessels, SCUBA gear, marine construction material, and instruments deployed in the Monument.

A majority of recent marine invasive species to Hawai'i are directly attributed to sessile and mobile biofouling organisms associated with hull fouling (Godwin et al. 2006). Therefore, prevention efforts will focus on introductions by vessel dispersal. These modes of dispersal include hulls and propellers, outboard motors, anchors and chains, fishing equipment, scientific dive gear, research floating platforms, and drydocks (Godwin et al. 2005). Inspections are mandatory for all permitted vessels prior to entering the Monument. A hull cleaning may be required prior to access.

Strategy AS-4: Eradicate the house mouse population on Sand Island, Midway Atoll, within 15 years.

Subsequent to the eradication of the black rat (*Rattus rattus*) at Midway Atoll and the Polynesian rat (*Rattus exulans*) at Kure Atoll, the house mouse (*Mus musculus*) on Sand Island, Midway, remains the only nonnative mammal left in the NWHI. Mice can cause high mortality in seabirds as large as albatrosses (Wanless et al. 2007.) In addition, Midway now hosts a translocated population of endangered Laysan ducks that are likely to be negatively affected by high mouse populations. Mice are also a major threat to native plants and terrestrial invertebrates.

Activity AS-4.1: Produce a house mouse eradication plan within 5 years and procure appropriate permits for chosen eradication techniques.

The eradication of introduced rodents from islands is routine, and the successful removal of black rats at Midway Atoll in recent years has provided a model for mouse eradication. Mice present additional challenges, however, such as much smaller home range sizes and different foraging and reproductive ecology. A careful planning effort that emphasizes the minimization of effects to nontarget organisms at the site and the other biological differences that may affect the operation is necessary.

Activity AS-4.2: Implement and complete house mouse eradication.

All of Sand Island (1,128 acres) will be treated with rodenticide, with active management to prevent nontarget impacts to native wildlife. Surveys of the affected ecosystem components before and after the operation will provide a valuable demonstration of the effects of introduced mice on biological communities.

Strategy AS-5: Prioritize infestations of alien terrestrial arthropods by species and locations and, within 5 years, develop and subsequently implement plans to control and if possible eradicate the highest-priority species.

Introduced insects can have devastating effects on native plant and animal communities, but our state of knowledge of the ecology of native terrestrial invertebrates in the Monument and our understanding of technologies for controlling and eradicating introduced arthropod species are minimal. Planning and prioritization will improve our chances of successfully managing this group of invasive species while minimizing negative effects to native species (terrestrial and aquatic).

Activity AS-5.1: Within 5 years, formulate a priority list of locations and species and a treatment plan to control and eventually eradicate all social Hymenopterans, such as ants and wasps, at all islands in the Monument.

Nineteen different species of ants have been recorded in the NWHI through the years (Nishida 1998, 2000). All of these are alien, and some have the potential to be exceedingly invasive and damaging to native plants and animals. Some species are more dangerous to native species than others, and different species of ant may require different approaches to eradication or control in terms of toxicant delivery and effectiveness, seasonality, habitat choices, and differences in accessibility of the infested islands. Other Hymenopterans such as wasps also threaten indigenous species, particularly insects.

Activity AS-5.2: Conduct toxicant trials to evaluate their efficacy and document ecological effects at selected islands on highest-priority invasive species of ants and wasps.

Specific toxicants for killing target species of ants and wasps and baits most palatable to the target species will be tested for efficacy and attractiveness before full-scale eradication efforts begin.

Activity AS-5.3: Control and if possible eradicate the two introduced mosquito species at Midway Atoll within 10 years using methods prescribed in the Integrated Alien Species Management Plan.

Reduction or elimination of mosquitoes (*Aedes albopictus* and *Culex quinquefasciatus*) at Midway will benefit humans, nesting seabirds, and the endangered Laysan duck, as well as other endangered bird species that might be translocated to Midway in the future (see the Threatened and Endangered Species Action Plan, Section 3.2.1) by eliminating the vector for avian pox, which already occurs there, and other arthropod-borne diseases that may arrive in the future. Monument staff will continue to kill mosquito larvae in freshwater ponds and manage mosquito reproduction while avoiding harm to endangered Laysan ducks and other species of migratory waterbirds and shorebirds, using either mosquito fish (*Gambusia affinis*) or bacterial control (*Bacillus thuringiensis israelensis*), depending on the wildlife species using each site. We will also eliminate mosquito breeding habitat by getting rid of standing water sources, where possible and appropriate, and by limiting access to standing water in pipes and cisterns.

Activity AS-5.4: Develop and implement a plan to control and if possible eradicate the invasive gray bird locust wherever it occurs.

Gray bird locusts (*Schistocerca nitens*) have been found on Nihoa, Mokumanamana, French Frigate Shoals, and Lisianski Island. To better respond to the invasive grasshopper *Schistocerca nitens*, a workshop was held in 2005 to address this threat species. Addressing one of the recommendations, Monument staff will continue to collect climate data, along with grasshopper abundance measures, to develop and continue improving a model for predicting outbreaks. Locust outbreaks are triggered by specific combinations of rainfall and drought, with egg laying favored by warm and dry conditions and survival of young grasshoppers favored by a flush of vegetation caused by rains at the appropriate time. Looking for correlations between grasshopper abundance and moisture and temperature conditions will allow better predictions of high locust populations.

Activity AS-5.5: Protect endangered plants threatened by gray bird locust outbreaks at Nihoa by developing appropriate baits for localized application of toxicants to protect specific high-priority plant sites.

Control of grasshoppers on islands such as Nihoa, with its many endemic species of arthropods, requires very careful choices of agents. Lower toxicity to nontarget organisms or specificity of delivery to just grasshoppers will be ensured.

Strategy AS-6: Control and eventually eradicate the highest-priority invasive plants in the terrestrial parts of the Monument within 15 years.

Invasive plants brought to the Northwestern Hawaiian Islands in the course of human activity have caused extensive damage through the years by displacing native plants and by changing the structure and composition of the vegetation community to make it less useful as habitat for other native organisms.

Activity AS-6.1: Control and eventually eradicate golden crownbeard and co-occurring weedy shrubs in all areas where they occur.

Golden crownbeard (*Verbesina encelioides*) is an invasive annual plant that is a prolific seed producer and grows in extremely dense monotypic stands, in which most other plant species are excluded. The species is currently found at Kure, Midway, and Pearl and Hermes Atolls. Control and eventual eradication will require breaking the cycle of the plant setting seed and then depleting the soil seed bank. This task is made much more difficult because of the high density of nesting seabirds, which precludes many mechanized forms of control. Areas to be treated by hand-pulling, mowing when appropriate, and treatment with glyphosate to prevent plants from setting seed and to exhaust the seed bank include 1,098 acres on Midway Atoll, 75 acres on Kure Atoll, and 34 acres on Pearl and Hermes Atoll. Several other invasive weeds are associated with *Verbesina* at Midway Atoll and will respond to the same treatments described above. These weeds include Spanish needle or beggartick (*Bidens alba* and *B. pilosa*), spiny pigweed (*Amaranthus spinosus*), haole koa (*Leucaena leucocephala*), castor bean (*Ricinus communis*), and hairy abutilon (*Abutilon grandifolium*).

Activity AS 6.2: Control and eventually eradicate the invasive grass sandbur from all areas of the Monument where it currently occurs.

The invasive grass sandbur (*Cenchrus echinatus*) has been successfully eradicated at Laysan Island and French Frigate Shoals, but currently exists at Kure, Midway, and Pearl and Hermes

Atolls, and Lisianski Island, so replicating the techniques described in Rehkemper and Flint (2002) will prevent the habitat degradation and loss of native plants and breeding seabirds at other sites in the NWHI where *Cenchrus echinatus* occurs. It can be eliminated by maintaining a year-round program of hand-pulling and limited spraying of glyphosate, to be scheduled so that no plant is ever allowed to go to seed; thus, the seed bank is eventually depleted.

Activity AS-6.3: Control and eventually eradicate Indian pluchea, Sporobolus pyramidatus, and swine cress from Laysan Island.

The introduced shrub *Pluchea indica* will be eradicated by cutting and painting stumps with Garlon® in a gradual manner to make sure seabird nesting habitat provided now by *Pluchea* is replaced with other shrubs being used in the ecological restoration at Laysan Island, such as ‘ilima (*Sida fallax*). Replacing this invasive shrub with native plants providing the same structure used by many nesting birds at Laysan Island is prescribed by the Draft Laysan Restoration Plan (Morin and Conant 1998). Athens, Ward, and Blinn (2007) discovered the pollen of the native shrub *Sida fallax*, previously unknown to Laysan Island, in the 7,000-year pollen core they studied from Laysan Lake. ‘Ilima has a similar growth form to the *Pluchea* now favored by nesting red-footed boobies and great frigatebirds at Laysan Island. The introduced grass *Sporobolus pyramidatus* and the herbaceous plant swine cress (*Coronopus didymus*) are vulnerable to hand-pulling and glyphosate treatments and also will be treated often enough to prevent any plant from setting seed.

Activity AS-6.4: Control and eventually eradicate prioritized alien plant species from Kure Atoll.

A preliminary Draft Kure Atoll Management Plan (2007) prioritizes alien species that need to be eradicated. Ironwood (*Casuarina equisetifolia*) will be eradicated by cutting down trees and painting the stumps with Garlon 4®. Beach heliotrope (*Tournefortia argentea*) will be controlled in beach dune areas by selectively removing young trees that have not attained the size that seabirds utilize for nesting. Chemical (probably glyphosate) and mechanical methods will be used to control and in some cases eradicate *Flaveria trinervia*, *Setaria verticillata*, *Chenopodium murale*, *Cynodon dactylon*, *Portulaca oleracea*, and *Boerhavia coccinea*. Native plants propagated in Kure Atoll’s nursery will be used to replace the nonnative plants that are removed.

Strategy AS-7: Investigate methods to eventually eradicate aquatic invasive organisms already known to be present in the Monument, and conduct regular surveillance for new invasions.

Aquatic invasive species present difficulties to resource managers because the technology for detection and subsequent control and eradication is not well established in marine environments. The spread of these alien species is harder to contain than are pests located on islands. These factors make locating, characterizing, and eliminating infestations of aquatic invasive species a high priority.

Activity AS-7.1: Map, control, and eventually eradicate invasive red algae where it occurs.

Monument staff will map current distributions by using SCUBA, technical mixed gas diving, or remotely operated vehicles and concentrate searches in areas where lobster trapping (commercial

or research) occurred. Searching for the extent of the infestation of *Hypnea musciformis* should start in areas in the NWHI where commercial and research trapping for lobsters has occurred, because it is thought that the original transport of the invasive algae may have been made by traps previously deployed in the main Hawaiian Islands.

Activity AS-7.2: Conduct surveillance at appropriate sites for snowflake coral and other incipient marine invasives.

Based on preferred sites already infested by snowflake coral (*Carijoa riisei*) in other areas and on understanding of the species life history and dispersion methods, the MMB will devise a plan for surveying sites with the highest probability of invasion by this damaging species.

Strategy AS-8: Conduct and facilitate research designed to answer questions regarding invasive species detection, effects on ecosystem, and alien species prevention, control, and eradication over the life of the plan.

Some of the invasive species problems facing Monument managers are without precedent because of the kinds and sizes of habitats being managed, the species involved, and the logistical and technical difficulties of working there. Research designed to assist in adapting methods to the Monument situation is essential for managing this unique National Monument.

Activity AS-8.1: Support and conduct research on alien species detection and the effects of invasive species on native ecosystems.

Monument staff, working with subject experts, will determine which methodologies for alien species detection and control will be appropriate for use in the NWHI. As appropriate, staff will initiate or support research on alien species detection and documentation of their ecological effects. Some of this work will be based on previous research done in other places and methodologies that have already been developed. Research priorities will be identified through updates to the Monument Research and Monitoring Plan (see the Marine Conservation Science Action Plan, Section 3.1.1). Research results on ecosystem effects will aid in prioritization of control and eradication efforts.

Activity AS-8.2: Support and conduct research on invasive species prevention, control methods, and eradication techniques.

The high level of protection afforded the Monument enables managers to exercise unprecedented levels of influence over practices that may prevent movement of invasive species into the area. Research to document the effectiveness of these measures will aid those managing other wildlands in choosing quarantine methods. Successful invasive species control and eradication programs require systematic investigations into the efficacy of techniques chosen and the ecological impacts of any methods used. Such an investigation has been outlined for the grasshopper invasion on Nihoa (Gilmartin 2005).

Strategy AS-9: Engage Monument users and the public in preventing the introduction and spread of alien species.

The organisms that have caused the greatest ecological disruption in the Monument all arrived as accidental introductions by humans. Educating all visitors to the area will go a long way toward

preventing future harmful species from reaching Papahānaumokuākea and will be knowledge that applies wherever they travel.

Activity AS-9.1: Integrate alien species information into the overall outreach program for Monument permittees.

As part of the outreach to all Monument permittees, Monument staff will develop outreach materials that include information on regulations, permit requirements, and best management practices related to alien species. The outreach program will help people identify alien species and understand the importance of, and methods for, preventing alien species introductions. A guide to marine and terrestrial alien species with photographs, modes of transport, reporting protocols, and best management practices will be used as part of the outreach program. Outreach may consist of printed materials and videos, as well as presentations that are part of the permit application process and as taxonomy training for staff and volunteers. Such a program could be developed in partnership with the University of Hawai‘i HIMB to develop staff, partners, and volunteers with expertise in field identification of various marine taxa. This program could include a certification program that demonstrates identification skill sets. (See the action plans for Permitting, Section 3.4.1; Enforcement, Section 3.4.2; Ocean Ecosystems Literacy, Section 3.5.4; and Constituency Building and Outreach, Section 3.5.2), and the Midway Atoll Visitor Services Plan (Appendix B).)

Activity AS-9.2: Integrate alien species information into general Monument outreach materials.

Monument staff will integrate messages on alien species into general education and outreach materials when appropriate opportunities arise. For example, the “Navigating Change” curriculum and video series developed in 2004 contained information on the threat of invasive species to native ecosystems (see the Ocean Ecosystems Literacy Action Plan, Section 3.5.4).

Strategy AS-10: Participate in statewide and Pacific regional alien species efforts.

Invasive species management is a challenge shared by resource managers worldwide. Exchange of technologies, strategies, and case histories of successes and failures are invaluable for all ecosystem stewards.

Activity AS-10.1: Build relationships with other resource managers and invasive species experts in the State, nation, and other countries based on shared challenges concerning invasive species.

Information exchange will maximize the effectiveness of collective resources and keep the MMB current on invasive species research, management, and outreach efforts throughout Hawai‘i and the Pacific. Because most vessels bound for the NWHI come from the main Hawaiian Islands, it is particularly important to support efforts there. Groups addressing invasive species in Hawai‘i include the Hawai‘i Invasive Species Council, the Alien Aquatic Organism Task Force, and the Coordinating Group on Alien Pest Species, among several others. The Pacific Invasives Network is addressing invasive species issues in Pacific islands. The State of Hawai‘i has hired an AIS coordinator with funds from the National Aquatic Nuisance Task Force and has obtained Hawai‘i Invasive Species Council funds to support the Aquatic Alien Species Response Team. Communication with these groups will provide opportunities for information and resource

sharing and implementation of standardized protocols for alien species reporting and monitoring species, including support for hull inspections, vessel monitorings, and other joint MMB activities.

Monument staff will participate in public and professional conferences, working group meetings, and activities focused on reducing the impacts of alien species statewide and in the Pacific region.

Table 3.3.2 Summary of Strategies, Activities, and Agency Leads for Alien Species

Strategies and Activities	Agency Lead
Strategy AS-1: Conduct planning to prioritize by threat level, invasiveness, and practicality of eradication or control all nonnative organisms in the Monument over the life of the plan.	
Activity AS-1.1: Complete an Integrated Alien Species Management Plan.	FWS
Activity AS-1.2: Develop best management practices to prevent, control, and eradicate alien species.	FWS
Strategy AS-2: Engage in active surveillance to monitor existing infestations and to detect new infestations of alien species over the life of the plan.	
Activity AS-2.1: Survey distributions and populations of known alien species at regular intervals.	FWS NOAA
Activity AS-2.2: Maintain a GIS database of marine and terrestrial alien species.	NOAA
Activity AS-2.3: Develop and implement monitoring protocols for early detection and characterization of new infestations.	NOAA
Strategy AS-3: Establish and enforce quarantine procedures appropriate for each site and habitat (terrestrial and aquatic) in the Monument to prevent the invasion or reinfestation of nonindigenous species over the life of the plan.	
Activity AS-3.1: Enforce the use of existing quarantine protocols to prevent the introduction of invasive terrestrial species to the Monument.	FWS
Activity AS-3.2: Continue to require hull inspection and cleaning of all vessels, SCUBA gear, marine construction material, and instruments deployed in the Monument.	NOAA
Strategy AS-4: Eradicate the house mouse population on Sand Island, Midway Atoll, within 15 years.	
Activity AS-4.1: Produce a house mouse eradication plan within 5 years and procure appropriate permits for chosen eradication techniques.	FWS
Activity AS-4.2: Implement and complete house mouse eradication.	FWS
Strategy AS-5: Prioritize infestations of alien terrestrial arthropods by species and locations and, within 5 years, develop and subsequently implement plans to control and if possible eradicate the highest-priority species.	
Activity AS-5.1: Within 5 years, formulate a priority list of locations and species and a treatment plan to control and eventually eradicate all social Hymenopterans, such as ants and wasps, at all islands in the Monument.	FWS
Activity AS-5.2: Conduct toxicant trials to evaluate their efficacy and document ecological effects at selected islands on highest-priority invasive species of ants and wasps.	FWS
Activity AS-5.3: Control and if possible eradicate the two introduced mosquito species at Midway Atoll within 10 years using methods prescribed in the Integrated Alien Species Management Plan.	FWS
Activity AS-5.4: Develop and implement a plan to control and if possible eradicate the invasive gray bird locust wherever it occurs.	FWS
Activity AS-5.5: Protect endangered plants threatened by gray bird locust outbreaks at Nihoa by developing appropriate baits for localized application of toxicants to protect specific high-priority plant sites.	FWS

Strategies and Activities	Agency Lead
Strategy AS-6: Control and eventually eradicate the highest-priority invasive plants in the terrestrial parts of the Monument within 15 years.	
Activity AS-6.1: Control and eventually eradicate golden crownbeard and co-occurring weedy shrubs in all areas where they occur.	FWS
Activity AS 6.2: Control and eventually eradicate the invasive grass sandbur from all areas of the Monument where it currently occurs.	FWS
Activity AS-6.3: Control and eventually eradicate Indian pluchea, <i>Sporobolus pyramidatus</i> , and swine cress from Laysan Island.	FWS
Activity AS-6.4: Control and eventually eradicate prioritized alien plant species from Kure Atoll.	State of Hawai‘i
Strategy AS-7: Investigate methods to eventually eradicate aquatic invasive organisms already known to be present in the Monument, and conduct regular surveillance for new invasions.	
Activity AS-7.1: Map, control, and eventually eradicate invasive red algae where it occurs.	NOAA
Activity AS-7.2: Conduct surveillance at appropriate sites for snowflake coral and other incipient marine invasives.	NOAA
Strategy AS-8: Conduct and facilitate research designed to answer questions regarding invasive species detection, effects on ecosystem, and alien species prevention, control, and eradication over the life of the plan.	
Activity AS-8.1: Support and conduct research on alien species detection and the effects of invasive species on native ecosystems.	NOAA
Activity AS-8.2: Support and conduct research on invasive species prevention, control methods, and eradication techniques.	FWS
Strategy AS-9: Engage Monument users and the public in preventing the introduction and spread of alien species.	
Activity AS-9.1: Integrate alien species information into the overall outreach program for Monument permittees.	NOAA
Activity AS-9.2: Integrate alien species information into general Monument outreach materials.	NOAA
Strategy AS-10: Participate in statewide and Pacific regional alien species efforts.	
Activity AS-10.1: Build relationships with other resource managers and invasive species experts in the State, nation, and other countries based on shared challenges concerning invasive species.	FWS

3.3.3 Maritime Transportation and Aviation Action Plan

Desired Outcome

Investigate, identify, and reduce potential threats to Papahānaumokuākea Marine National Monument from maritime and aviation traffic.

Current Status and Background

With the exception of a few small boats at Midway Atoll, French Frigate Shoals, and Kure Atoll, no vessels have home ports in the NWHI. Therefore, almost all marine traffic in the waters surrounding the NWHI is from transiting merchant vessels, research ships, and fishing vessels; with cruise ships, U.S. Coast Guard ships, and recreational vessels visiting less frequently. An estimated 50 vessels pass through the U.S. Exclusive Economic Zone surrounding the NWHI each day (Mathers 2005, pers. com.). Navy ships and vessels conduct training and participate in testing activities in the Hawaii Range Complex, which encompasses the Monument, and vessels that support missile defense tests occasionally operate in Monument waters. Vessels in shallow waters are at higher risk of impacting resources.

Links to other Action Plans	
3.2.1	Threatened and Endangered Species
3.3.2	Alien Species
3.3.4	Emergency Response
3.4.1	Permitting
3.4.2	Enforcement
3.5.2	Constituency Building and Outreach
3.5.4	Ocean Ecosystems Literacy
3.6.3	Coordinated Field Operations

Links to Goals
Goal 1
Goal 2
Goal 3
Goal 4
Goal 8

A relatively small number of flights are conducted in the Monument. The MMB agencies charter on average 27 flights to French Frigate Shoals and 45 flights to Midway Atoll each year to transport supplies and personnel. The Coast Guard conducts regular enforcement overflights, often landing at Midway Atoll for refueling. A few research and management activities associated with remote sensing, mapping, wildlife survey, and marine debris detection may be conducted by aircraft each year. The planning associated with ship, small boat, and aircraft activities is discussed in the Coordinated Field Operations Action Plan, Section 3.6.3.

Need for Action

All activities conducted in the Monument must meet the requirements articulated in Presidential Proclamation 8031, which established the Monument. Consistent with the spirit of the Proclamation, the MMB will investigate, identify, and reduce threats to the NWHI ecosystems. This work includes regularly evaluating the effects ships and aircraft may have on the environment during the course of normal operations and identifying ways in which they can be reduced. The MMB will periodically review vessel and aircraft activities,



recognizing that future increase in access to and use of the Monument could result in increased risks associated with transportation. The MMB is committed to minimizing the environmental footprint generated through maritime and aviation traffic.

Ships and aircraft allow human access and make activities possible in the vast and remote NWHI. However, they also bring with them the possibility of threats or environmental hazards. Some of these hazards are critical in nature and demand immediate response, such as groundings and fuel, chemical, or oil spills (see the Emergency Response and Natural Resource Damage Assessment Action Plan, Section 3.3.4). Others are biological in nature, such as the threat of alien species introductions through vessel hull fouling or ballast water discharge (see the Alien Species Action Plan, Section 3.3.2), or interactions with protected marine species (see the Threatened and Endangered Species Action Plan, Section 3.2.1). This action plan establishes a framework to evaluate various activities conducted by ships and aircraft.

Strategies to Achieve the Desired Outcome

Two strategies have been identified for achieving the desired outcome of preventing and reducing impacts of vessels and aircraft operating in and transiting the NWHI. Strategies and activities are coded by the acronym for the action plan title, “Maritime Transportation and Aviation” (MTA). A summary of strategies and activities is provided in Table 3.3.3 at the end of this action plan.

- MTA-1: Increase awareness of navigational hazards and ecological sensitivity of the Monument.
- MTA-2: Conduct studies to identify potential aircraft and vessel hazards and adopt measures to prevent adverse impacts.

Strategy MTA-1: Increase awareness of navigational hazards and ecological sensitivity of the Monument.

The banks, atolls, and other reefs of the NWHI support a diverse array of species assemblages forming a system that is unique in the world (Friedlander et al. 2005), which could experience catastrophic losses in the event of a major ship grounding or oil spill. The MMB continues to analyze threats to the ecosystem from vessel traffic (see activity MTA-2.1, below). The establishment of internationally recognized shipping designations will raise awareness about the sensitivity and dangers of operating in the Monument, as well as provide information about the incidence of unreported international vessels transiting the area.

Activity MTA-1.1: Coordinate implementation of domestic and international shipping designations with appropriate entities.

Potential impacts to Monument resources from ship traffic, including habitat damage from groundings, hazardous materials spills, and sewage and ballast water discharges, have been identified as some of the primary anthropogenic threats to the vulnerable and valuable natural and cultural resources of the area. PSSA designation will augment domestic protective measures by alerting international mariners to exercise extreme caution when navigating through the area.

On April 3, 2008, the IMO designated the Monument as a PSSA. As part of the PSSA designation process, the IMO adopted U.S. proposals for associated protective measures consisting of (1) expanding and consolidating the six existing recommendatory Areas To Be

Avoided (ATBAs) in the Monument into four larger areas and enlarging the class of vessels to which they apply; and (2) establishing a ship reporting system for vessels transiting the Monument, which is mandatory for ships 300 gross tons or larger that are entering or departing a U.S. port or place and recommended for other ships. The IMO protective measures do not apply to the activities and exercises of the Armed Forces (including the U.S. Coast Guard) that are consistent with applicable laws. Sovereign immune vessels also are not subject to the reporting requirement but all vessels are encouraged to participate.

The vessel reporting system requires that ships notify the U.S. shore-based authority (the U.S. Coast Guard; NOAA will be receiving all messages associated with this program on behalf of the Coast Guard) at the time they begin transiting the reporting area and again when they exit. Notification is made by e-mail through the Inmarsat-C system or other satellite communication system. It is estimated that almost all commercial vessel traffic will be able to report via Inmarsat-C. The Armed Forces are not subject to the access restrictions and reporting requirements in the Monument when they are conducting activities and exercises.

The PSSA and associated protective measures were adopted to provide additional protection to the exceptional natural, cultural, and historic resources in the Monument. Requiring vessels to notify NOAA upon entering the reporting area will help make the operators of these vessels aware that they are traveling through a fragile area with potential navigational hazards such as the extensive coral reefs found in many shallow areas of the Monument. The PSSA and associated protective measures are now in effect.

NOAA and FWS are establishing the infrastructure that will be required to maintain an international ship reporting system and to ensure that information regarding PSSA designation will be incorporated into nautical charts and other information sources. Appendix G of Volume III contains the relevant documents for the IMO designated PSSA around the Monument.

Activity MTA-1.2: Develop boundary and zoning informational tools.

Information on the PSSA designation, zones, boundaries, and regulations will be made available to Monument users to help them comply with all maritime transportation requirements. Global positioning system coordinates will be provided along with nonnavigational reference maps in the appropriate public documents. The MMB will work with NOAA's Office of Coast Survey to update NOAA navigational charts as well as to provide appropriate information to mariners in the United States Coast Pilot®, a series of nautical reference books.

Activity MTA-1.3: Provide necessary updates to nautical charts and the Notice to Mariners.

The MMB will work with the appropriate NOAA and Coast Guard offices to update the nautical charts and Notice to Mariners to reflect Monument boundaries, zones, and other pertinent designations. The U.S. Notice to Mariners announces updates to National Geospatial-Intelligence Agency and National Ocean Service charts using information collected from many sources, among them the Coast Guard Local Notices. The U.S. Notice to Mariners will contain only those chart corrections of interest to ocean-going vessels.

Bathymetric data collected as part of research and monitoring in the NWHI may be used to update nautical charts. However, standards for data used for benthic habitat mapping are less rigorous than are applied to hydrographic survey, so most of the data collected to date in the NWHI are unlikely to be used for updating charts Monument-wide. Nautical charts can be updated only using bathymetric surveys that meet the standards of the International Hydrographic Organization (IHO). Therefore, when a survey is to be conducted in an area where chart updates would be useful, the survey planners will work with the Hydrographic Surveys division of the Office of Coast Survey to determine whether the minimum requirements for IHO standards for chart updates are compatible with the mandated research objectives. Often, these standards are greater than the scientific survey needs, so if collaborative dual-purpose surveying is undertaken, cost-sharing agreements will be sought with the Office of Coast Survey during survey planning. Nautical charts are updated based on national prioritized needs, and even if data are collected to IHO standards, many years could pass between survey completion and the incorporation of updates to the associated charts. As such, updating all NWHI nautical charts is a long-term goal.

Strategy MTA-2: Conduct studies to identify potential aircraft and vessel hazards and adopt measures to prevent adverse impacts.

While many aircraft and vessel hazards are known and can be reduced through regulations and permit requirements, more information needs to be gained about potential hazards to minimize human impacts and maximize resource protection. Specific information gained through small-scale studies can strengthen or add specificity to regulations and permit requirements should they be needed.

Activity MTA-2.1: Conduct studies on potential aircraft and vessel hazards and impacts.

Various studies on potential aircraft and vessel hazards may be conducted based on priority threats identified in the comprehensive threat assessment discussed in the Enforcement Action Plan (Section 3.4.2). These studies may include, but are not limited to, the following: an anchoring/mooring location feasibility study; a long-term study on mandatory hull inspections and cleaning for all vessels accessing the Monument; studies on alien species introductions via aircraft; an assessment of permit reporting requirements for interactions with federally protected species and other wildlife; a light and sound study; and a discharge study.

Activity MTA-2.2: Develop protocols and practices as needed and integrate with existing protocols for safe aircraft and vessel operations.

The MMB will work with the ICC to convene a group of experienced aircraft and vessel operators to discuss safety for humans and wildlife during flight and boating operations. Existing protocols will be evaluated and other recommendations sought to reduce risks to personnel and the environment through pre-trip training and standard procedures. New protocols and practices will be developed as needed.

Activity MTA-2.3: Improve existing pre-access information for inclusion on the Monument website and in permit application instructions.

The following information will be incorporated into pre-trip training for Monument users and vessel operators: information on regulations and compliance; navigation hazards; emergency

response protocols and contacts; zoning designations, including waste discharge location and types; preventing the introduction of alien species; preventing and reporting interactions with protected species and other wildlife; preventing light and sound pollution; and preventing anchor damage to coral reefs and other benthic habitats and organisms. The information will be conveyed as appropriate to all vessel operators, captains, crews, and trip participants. The MMB will also incorporate this information into written materials to be distributed to potential visitors. (See the action plans for Permitting, Section 3.4.1; Enforcement, Section 3.4.2; Ocean Ecosystems Literacy, Section 3.5.4; and Constituency Building and Outreach, Section 3.5.2.)

Activity MTA-2.4: Conduct activities to improve energy and water conservation measures on all vessels operating in the Monument.

The NOAA ship *Hi'ialakai* sets an example for the fleet by increasing shipboard conservation measures each year. In 2006, the ship began a recycling program and began installing water-saving devices to reduce impacts to the Monument as well as other parts of the ocean where the ship operates. In 2008, NOAA plans to test the use of biofuels and nonpetroleum-based hydraulic fluid on the *Hi'ialakai*. The MMB will continue to work with ship managers on these measures and encourage similar practices for all vessels that operate in the Monument.

Table 3.3.3 Summary of Strategies, Activities, and Agency Leads for Maritime Transportation and Aviation

Strategies and Activities	Agency Lead
Strategy MTA-1: Increase awareness of navigational hazards and ecological sensitivity of the Monument.	
Activity MTA-1.1: Coordinate implementation of domestic and international shipping designations with appropriate entities.	NOAA
Activity MTA-1.2: Develop boundary and zoning informational tools.	NOAA
Activity MTA-1.3: Provide necessary updates to nautical charts and the Notice to Mariners.	NOAA
Strategy MTA-2: Conduct studies to identify potential aircraft and vessel hazards and adopt measures to prevent adverse impacts.	
Activity MTA-2.1: Conduct studies on potential aircraft and vessel hazards and impacts.	NOAA
Activity MTA-2.2: Develop protocols and practices as needed and integrate with existing protocols for safe aircraft and vessel operations.	NOAA
Activity MTA-2.3: Improve existing pre-access information for inclusion on the Monument website and in permit application instructions.	NOAA
Activity MTA-2.4: Conduct activities to improve energy and water conservation measures on all vessels operating in the Monument.	NOAA

3.3.4 Emergency Response and Natural Resource Damage Assessment Action Plan

Desired Outcome

Minimize damage to Papahānaumokuākea Marine National Monument resources through coordinated emergency response and assessment.

Current Status and Background

The history of shipwrecks and groundings is as old as the history of ships in the NWHI. Many islands and atolls are named for ships that went aground. This history continues, with four recent vessel groundings. The *Paradise Queen* and *Grendel* went aground at Kure Atoll in 1998 and 2007, respectively, and the *Swordman II* and *Casitas* went aground at Pearl and Hermes Atoll in 2000 and 2005, respectively. Natural disasters such as tropical cyclones and tsunamis, while rare, also threaten Monument natural, cultural, and historic resources. The remote locations in the Monument have logistically and financially challenged effective response and remediation efforts to date and will continue to be a primary factor in future emergency response efforts.

Links to other Action Plans	
3.3.2	Alien Species
3.3.3	Maritime Transportation and Aviation
3.4.1	Permitting
3.6.2	Information Management

Links to Goals
Goal 1
Goal 2
Goal 3
Goal 4

Emergency response in the NWHI will be coordinated under a series of plans and systems, including the National Response Plan and the National Incident Management System. The National Response Plan establishes a comprehensive all-hazards approach to enhance the ability of the United States to manage domestic incidents, including oil and hazardous chemical spills. This plan incorporates the National Contingency Plan and its regulations governing how oil pollution response is conducted by the Coast Guard, EPA, the affected state, and resource trustees, including NOAA and FWS. The NWHI are covered specifically by the Hawai‘i Area Contingency Plan (Version 5.0 - May 02, 2005; <http://homeport.uscg.mil/mycg/portal/ep/portDirectory.do?tabId=1&cotpId=27>). This Area Contingency Plan describes the strategy for a coordinated industry, federal, state, and local response to a discharge or substantial threat of discharge of oil or a release of a hazardous substance. The Area of Responsibility of U.S. Coast Guard Sector Honolulu Captain of the Port Zone includes the Northwestern Hawaiian Islands.



Houei Maru #5 bow section. Wrecked in 1976 at Kure Atoll. Photo: Dan Suthers

FWS and NOAA have designated representatives who are federal members of the Regional Response Team, which makes response recommendations to the federal on-scene coordinator.

The Hawai‘i DLNR and the Hawai‘i Department of Health are the designated state representatives for all marine injury events. The Department of Health is the state on-scene coordinator. These representatives work closely with all parts of FWS, NOAA, the State, and the MMB in making recommendations on the use of alternative response technologies, such as dispersants. Unlike the State, NOAA and DOI can make only consultative recommendations; they do not have a formal vote in that process.

While the Monument and state regulations regulate access, they also provide a general exemption for activities necessary to respond to emergencies. The general exemption for emergencies allows for individuals responding to emergencies threatening life, property, or the environment to conduct necessary activities without the need for a permit. The general exemption applies only to the emergency response activity itself and not to ancillary activities, such as training for emergency response, salvage operations, remediation, or restoration. These ancillary actions also require timely response and would be covered under the appropriate agency’s conservation and management permit.

Monument staff have access to resources-at-risk information that is of interest during contingency planning and spill response through the Sanctuaries Hazardous Incident Emergency Logistics Database System, a web-based decision support tool commonly referred to as “SHIELDS.” This tool includes regulatory information, contact lists, GIS maps, environmental sensitivity indexes, information on resources at risk, and significant terrestrial and submerged historic and cultural resource and hazards data. Environmental Sensitivity Indices were last produced by NOAA for this area in 2001. Environmental Sensitivity Indices identify resources at risk on a seasonal and location basis and facilitate decisions about response options given threats to specific resources at risk.

In addition, the Monument’s own GIS database of spatial resource data and the FWS Asset Maintenance Management System will be used to document this information. As the Monument continues to move toward a comprehensive biogeographic, cultural, and historic understanding of the NWHI, prevention and emergency response methods will improve (see the Information Management Action Plan, Section 3.6.2).

Need for Action

In light of recent vessel grounding events in the NWHI and devastating natural disasters around the world, a clear need exists for the Monument to participate in emergency response efforts to address situations that threaten resources in and around the Monument. Grounded vessels and their related debris and pollution must be removed from the reefs as soon as possible to prevent damage to coral reef ecosystems and protected marine mammals, turtles, and seabirds.

Emergency response for events such as vessel groundings; oil, fuel, or chemical spills; or releases of hazardous substances is addressed through the Hawai‘i Area Contingency Plan, which is a local plan under the larger structure of the National Response Plan. The Monument Co-Trustees and Interagency Coordinating Committee will seek to address NWHI responses as part of the Area Contingency Plan.

Developing a response capacity for events that fall beyond the scope of the existing response structure of the Area Contingency Plan is necessary to support the mission of the Monument and

the long-term protection of the resources of the NWHI. Events that may require an MMB-directed response include vessel groundings that neither pose the threat of hazardous release nor navigational hazard, as well as detrimental natural events such as disease outbreaks, severe storms, alien species introductions, or impacts of climate change (e.g., coral bleaching).

This action plan describes strategies and activities to plan for and respond to an emergency within the established Incident Command System (ICS) for the region, and other unanticipated events that fall outside the scope of the Hawai‘i Area Contingency Plan. The MMB will establish a Monument Emergency Response and Assessment Team (ERAT) that will determine what types of emergencies are likely within the Monument. For each identified possible emergency, the type and scope of necessary response will be determined.

Strategies to Achieve the Desired Outcome

Within the context of the existing Area Contingency Plan and other informational tools, including SHIELDS, the MMB seeks to integrate its resources in a way that benefits both Monument resources and regional efforts. The MMB can contribute primarily through building an internal and interagency capacity to contribute to emergency response efforts and by providing relevant and current information regarding NWHI resources so that current data are readily available and accessible to the Regional Response Team and any unified command that may be established to address an incident.

To coordinate Monument response to emergencies in a manner that minimizes damage to resources and mechanisms to assess damage, the following strategies have been identified. The strategies and activities are coded by the acronym for the action plan title, “Emergency Response and Natural Resource Damage Assessment” (ERDA). A summary of strategies and activities is provided in Table 3.3.4 at the end of this action plan.

- ERDA-1: Create a Monument Emergency Response and Assessment Team within 1 year.
- ERDA-2: Assess response needs for non-Incident Command System emergencies within 2 years.
- ERDA-3: Update and create, as necessary, Monument resource protection plans and protocols within 3 years.

Strategy ERDA-1: Create a Monument Emergency Response and Assessment Team within 1 year.

An interagency team will be created and integrated with local responders from other federal and state agencies to assess resource damage and respond to emergencies in the Monument. The Monument ERAT will interface with the existing local area response team within the Incident Command. Whenever possible, the team will provide assistance and coordination in an actual response. Following an emergency, the ERAT will participate in an injury assessment with other federal and State of Hawai‘i natural, cultural, and historic resource trustees. In the event of a response to and assessment of injury from a non-ICS event, such as severe storm damage or coral bleaching, the team will conduct this assessment and initiate appropriate monitoring.

Activity ERDA-1.1: Create a Monument Emergency Response and Assessment Team for ICS responses.

An ERAT will be created to interface with the existing local area response team within the Incident Command, the Regional Response Team, and the Scientific Support Team. The team members will include specific species experts, law enforcement, and experts by area and habitat type, and may recruit or consult other such experts as needed. Because this is an interagency effort, regular reports on the status of the ERAT will be made to the ICC. The team will also assist in identification of primary and compensatory restoration options as well as implementation and oversight of restoration and monitoring. The team will also develop standard operating procedures for onsite incident investigations, resource injury determination, asset conditions, emergency detection, assessment, and restoration.

Activity ERDA-1.2: Acquire and maintain training and certification to complement and support the Regional Response Team.

Under the Area Contingency Plan, the Regional Response Team is charged with preparedness for emergencies. This preparedness will necessitate training and certifications, including ICS, Hazardous Waste Operations and Emergency Response (HAZWOPR), boat safety, flight safety, first responder, and first aid.

Activity ERDA-1.3: Participate in emergency response and preparedness drills and meetings throughout the life of the plan.

The ERAT will attend Regional Response Team meetings, as appropriate, to keep abreast of current communication and training and to build working relationships with agency staff that make up both the Regional Response Team and the Coast Guard agency staff. Participation in emergency response drills and other events will help with preparedness and better integration into the response process. One of the main functions of the ERAT is to provide information and data to minimize impact on Monument resources by the event or the response.

Activity ERDA-1.4: Participate in damage assessment programs and training throughout the life of the plan.

Damage assessment is an important component of any emergency response. The ERAT is expected to contribute in area and resource knowledge; therefore, training in natural resource damage assessment is necessary. The ERAT will work closely with the FWS Environmental Contaminants Program and Oil Spill Response Coordinator and the ONMS Resource Protection Team in Silver Spring, Maryland, State on-scene coordinator, and State Department of Health Office of Hazard Evaluation and Emergency Response, as appropriate, to ensure that appropriate response, injury assessment, and restoration activities take place for any given case. This effort may include coordination with the DOI, FWS, NOAA Natural Resource Damage Assessment and Restoration Programs, the U.S. Department of Justice, Coast Guard, and other federal and State of Hawai'i resource damage assessment programs to assess the extent of injury from a particular emergency event (see Section 3.3.2, Alien Species Action Plan, Activity AS-1.1).

Strategy ERDA-2: Assess response needs for non-Incident Command System emergencies within 2 years.

Activity ERDA-2.1: In the second year, determine the non-ICS emergencies and the necessary type and scope of responses.

The ERAT will be responsible for determining what types of non-ICS emergencies are likely within the Monument. In the event of a needed response to natural events—such as disease outbreaks, severe storms, alien species introductions, or coral bleaching events,—or vessel groundings not releasing oil or hazardous substances, the ERAT will need specialized protocols for response. For each identified possible non-ICS emergency, the type and scope of necessary response will be determined.

Activity ERDA-2.2: Designate appropriate Monument personnel for each non-ICS response team.

The team members will include specific species experts and experts by area and habitat type, and may recruit or consult other such experts as needed. Because this is an interagency effort, regular reports on the status of the response teams will be made to the Papahānaumokuākea ICC. Each team member will also assist in the identification of primary and compensatory restoration options, if warranted, as well as implementation and oversight of restoration and monitoring. Team members will also develop standard operating procedures for injury determination, emergency detection, assessment, and restoration.

Activity ERDA-2.3: Throughout the life of this plan, ensure that appointed personnel acquire and maintain training and certifications.

Designated response personnel will maintain preparedness for emergencies. Preparedness will necessitate training and certifications including HAZWOPR, boat safety, flight safety, and first aid. Additional training considerations can include the Oil Pollution Act (OPA) and Natural Resource Damage Assessment (NRDA) process.

Strategy ERDA-3: Update and create, as necessary, Monument resource protection plans and protocols within 3 years.

Multiple agency and interagency emergency plans that apply to the Monument currently exist, such as continuity of operations plans, oil spill response plans, and aircraft incident plans. To ensure efficiency and effectiveness, the MMB agencies will coordinate and update these plans, as well as develop new plans or protocols as needed.

Activity ERDA-3.1: Update and improve upon the Area Contingency Plan and the Environmental Sensitivity Indices.

In concert with partners, MMB staff will update and improve upon the Hawai‘i Area Contingency Plan to better describe a range of potential emergency response actions in the NWHI and appropriately define how the ERAT will assess and respond to an emergency. Monument-specific information will be presented to the area committee for inclusion as appropriate in the Area Contingency Plan. In order to determine and develop appropriate response strategies to emergencies in the NWHI, a workshop will be held involving all partner agencies, parties that are typically involved in responses, and individuals, organizations, and researchers who are active in the region or have a particular specialty area that relates to the NWHI.

Activity ERDA-3.2: Within 3 years, create damage assessment criteria and protocols.

Following an emergency, the ERAT will participate in an injury assessment with other federal and State of Hawai‘i natural resource trustees. In the event of an MMB response to a non-ICS event, the team will conduct the assessment and initiate appropriate monitoring. Therefore, the ERAT will develop damage assessment criteria and protocols for the natural, cultural, and historic resources in the Monument.

Table 3.3.4 Summary of Strategies, Activities, and Agency Leads for Emergency Response and Natural Resource Damage Assessment

Strategies and Activities	Agency Lead
Strategy ERDA-1: Create a Monument Emergency Response and Assessment Team within 1 year.	
Activity ERDA-1.1: Create a Monument Emergency Response and Assessment Team for ICS responses.	NOAA
Activity ERDA-1.2: Acquire and maintain training and certification to complement and support the Regional Response Team.	NOAA
Activity ERDA-1.3: Participate in emergency response and preparedness drills and meetings throughout the life of the plan.	NOAA
Activity ERDA-1.4: Participate in damage assessment programs and training throughout the life of the plan.	NOAA
Strategy ERDA-2: Assess response needs for non-Incident Command System emergencies within 2 years.	
Activity ERDA-2.1: In the second year, determine the non-ICS emergencies and the necessary type and scope of responses.	NOAA
Activity ERDA-2.2: Designate appropriate Monument personnel for each non-ICS response team.	NOAA
Activity ERDA-2.3: Throughout the life of this plan, ensure that appointed personnel acquire and maintain training and certifications.	NOAA
Strategy ERDA-3: Update and create, as necessary, Monument resource protection plans and protocols within 3 years.	
Activity ERDA-3.1: Update and improve upon the Area Contingency Plan and the Environmental Sensitivity Indices.	NOAA
Activity ERDA-3.2: Within 3 years, create damage assessment criteria and protocols.	NOAA

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3.4 Managing Human Uses

3.4.1 Permitting Action Plan

3.4.2 Enforcement Action Plan

3.4.3 Midway Atoll Visitors Services Action Plan

3.4 Managing Human Uses

Globally, pollution, coastal development, resource extraction, climate change, natural hazards, and alien species introductions threaten terrestrial and marine ecosystems. As many of these threats are associated with human activities, a common element shared among most protected areas is the need to regulate human activities to minimize impacts. Indeed, this need to regulate human activities is the reason most protected areas are established. In certain sites, protection is achieved through prohibiting all access to a given area. In other areas, education may be the sole tool used to lessen the impacts people have on a given environment. Most protected areas utilize an assortment of management strategies, including zoning, permit authorization, regulations, and conservation plans to manage human activities and their potential impacts.

As a remote site without a significant resident or visitor population, the Monument has an advantage over many other protected areas in that the number of people and overall activity occurring is relatively low. Conversely, the Monument's remote location presents surveillance and enforcement challenges for effective management.

The NWHI have a long history of human activity, including early discovery and use by Native Hawaiians; exploitation of terrestrial and marine resources beginning in the late 1800s; commercial fishing beginning in the mid-1900s; and military activity during World War II. More recent activities in the NWHI include the U.S. Navy's use of Midway Atoll, the U.S. Coast Guard's stations at Kure Atoll and Tern Island, an ecotourism operation at Midway Atoll, and a commercial lobster fishery that was subject to zero harvest in 2000. Current activities are limited primarily to management activities by jurisdictional agencies, including habitat conservation and management, research, education, Native Hawaiian practices, recreation and historic preservation at Midway Atoll, and fishing by a small commercial bottomfish and pelagic trolling fleet. The DOD also conducts missile defense testing and Navy training and testing activities.

Human activities in the Monument are managed through a framework of regulations, permitting, zoning, and enforcement. The three action plans in this section focus on regulating activities through permits and compliance, through enforcement surveillance of activities in the Monument, and under a visitor services program at Midway Atoll. Zoning through Special Preservation Areas, Ecological Reserves, and the Midway Atoll Special Management Area establish spatial restrictions on human activities and are described in more detail in Section 2.0.

The Monument regulations prohibit access except for: passage without interruption; activities and exercises of the Armed Forces (including those of the Coast Guard); activities necessary to respond to emergencies or necessary for law enforcement; and, until June 15, 2011, bottomfish fishing conducted pursuant to a valid permit issued by NOAA. Monument permits are required for activities conducted in the Monument. Prior to the establishment of the Monument, each jurisdictional agency would have considered and issued separate permits for the same activity. Development of the Monument permit application process and application instructions was completed within a year after Monument designation. This process produced a single permit application for all applicants and a general permit template used by Co-Trustees when issuing permits throughout the Monument. Most of the Co-Trustee agency mandates and policies are

met by this general template. Those that are not met are addressed by special conditions that are added in addition to the general terms and conditions listed on each permit.

Compliance with regulations, laws, and permit requirements for all activities is enforced using surveillance, Vessel Monitoring System tracking, relevant technology, operations plans, and penalties. Co-Trustee and interagency cooperation on enforcement will become increasingly integrated and coordinated, allowing for greater capacity, effectiveness, and efficiency over time.

With the establishment of the Monument, Midway Atoll takes on the additional role of providing a “window” so that visitors can learn about and enjoy a small portion of the largest fully protected marine managed area in the world. The Co-Trustees remain committed to offering a high-quality, small-scale visitor program at Midway Atoll. By physically experiencing the Northwestern Hawaiian Islands, visitors will return home with a personal connection and commitment to protecting and conserving the Monument’s unique resources.

Each action plan consists of a set of strategies to address a desired outcome. The desired outcomes of these action plans over the 15-year planning horizon are:

- **Permitting:** Implement an effective and integrated permit program for Papahānaumokuākea Marine National Monument that manages, minimizes, and prevents negative human impacts by limiting access only for those activities consistent with Presidential Proclamation 8031 and other applicable laws, regulations and executive orders.
- **Enforcement:** Achieve compliance with all regulations within Papahānaumokuākea Marine National Monument.
- **Midway Atoll Visitor Services:** Offer visitors opportunities to discover, enjoy, appreciate, protect, and honor the unique natural, cultural, and historic resources of Papahānaumokuākea Marine National Monument.

Action plans described in this section will be implemented in close coordination with Co-Trustee partners and in conjunction with other priority management needs.

3.4.1 Permitting Action Plan

Desired Outcome

Implement an effective and integrated permit program for Papahānaumokuākea Marine National Monument that manages, minimizes, and prevents negative human impacts by limiting access only for those activities consistent with Presidential Proclamation 8031 and other applicable laws, regulations and executive orders.

Current Status and Background

The Monument permit program is an integral part of a management framework based on Monument regulations (see Appendix D), other federal and state regulations, zoning, enforcement, goals, Native Hawaiian cultural values, and collaboration within the MMB. This permit program is designed to ensure long-term protection of the NWHI by providing the Co-Trustees with a management tool to regulate, monitor, and understand the impacts of permitted activities on the ecosystem.

Proclamation 8031 requires a Monument permit for access to the Monument for a limited range of activities. State regulations (HAR sections 13-60.5 and 13-125, 50 CFR Part 25, 26, 38, and 404) are subject to permit requirements in State waters as well. Prior to Monument designation, many of these activities would have required multiple access permits from different agencies. Permits authorized for activities conducted within the national wildlife refuges, the state’s Northwestern Hawaiian Islands Marine Refuge, the State Seabird Sanctuary at Kure Atoll, or the Reserve may have required one or more permits issued by FWS, the State of Hawai‘i, or the Reserve. However, with the advent of the Monument, all proposed activities are reviewed and considered jointly by all three Co-Trustees.

Development and implementation of a unified Monument permit application, application instructions, and Monument permit template occurred within the first year following Monument designation. All permitted activities are authorized under the issuance of a single Monument permit signed by designees of the three Co-Trustees. Most of the Co-Trustee agency mandates and policies are met by this unified permit. Those that are not met by the permit general terms and conditions are added as special conditions. The Co-Trustees issue Monument permits under the authority of the implementing regulations for the Monument, as described in 50 CFR 404.11 and consistent with all other applicable state and federal laws.

Previously, the State of Hawai‘i Land Board was the primary public forum for notification of Monument permit applications under consideration by Co-Trustees. To ensure the general public has access to and is informed of all permit applications under review, a policy on public posting was developed and finalized in November 2007 (Appendix A). This policy was developed jointly by the MMB to guide public notification of permit applications and provide an opportunity to review all proposed activities in the Monument.

Links to other Action Plans	
3.1.1	Marine Conservation Science
3.1.2	Native Hawaiian Culture and History
3.2.1	Threatened and Endangered Species
3.2.2	Migratory Birds
3.2.3	Habitat Management and Conservation
3.4.2	Enforcement
3.4.3	Midway Atoll Visitors Services
3.5.1	Agency Coordination
3.5.2	Constituency Building and Outreach
3.5.3	Native Hawaiian Community Involvement
3.5.4	Ocean Ecosystems Literacy
3.6.2	Information Management

Links to Goals
Goal 1
Goal 2
Goal 3
Goal 4
Goal 5
Goal 7
Goal 8

Monument Permit Types

All activities in the Monument, with limited exceptions, require a permit (see Monument regulations, Appendix D). Activities are either prohibited, excluded (no permit is needed), or regulated (must be considered through permitting process). Prohibited activities include:

- Exploring for, developing, or producing oil, gas, or minerals within the Monument;
- Using or attempting to use poisons, electrical charges, or explosives in the collection or harvest of a Monument resource;
- Introducing or otherwise releasing an introduced species from within or into the Monument; and
- Anchoring on or having a vessel anchored on any living or dead coral with an anchor, anchor chain, or anchor rope.

Exempted activities include:

- Response to emergencies threatening life, property, or the environment;
- Law enforcement purposes;
- Activities and exercises of the Armed Forces; (including the United States Coast Guard) and
- Passage without interruption.

Domestic vessels wishing to pass through the Monument must meet notification requirements, including notification by phone or email at least 72 hours prior to entry and within 12 hours of leaving the Monument (see Appendix D, Monument Regulations).

The Proclamation allows the Secretaries of the Interior and Commerce to issue permits for sustenance fishing outside of any Special Preservation Area as a term or condition of any permit issued, if the activity is conducted in a manner compatible with the Proclamation. Sustenance fishing in the Midway Atoll Special Management Area can be permitted only if it is determined by the Director of the FWS (or designee) to be compatible with the purposes for which the Midway Atoll NWR was established. In accordance with these specifications, the draft FWS Appropriateness Finding and Compatibility Determination for this activity was available as a part of the Draft MMP and has been finalized.

The existing federally regulated commercial bottomfish fishery (permitted under the authority of NOAA Fisheries) does not require a Monument permit. However, in addition to compliance with the fisheries regulations, these permittees must also comply with the Proclamation and Monument regulations. The Proclamation closes the remaining commercial bottomfish fishery in June 2011.

Regulated activities must be considered in the permit process. Under Monument permit criteria, access may be permitted for six types of activities. These are:

- Research,
- Education,
- Conservation and management,
- Native Hawaiian practices,
- Special ocean uses, and

- Recreation.

These permit categories, although different in name from the three types of activities listed in section 13-60.5-5, HAR are consistent with activities that may be allowed under state law. All activities eligible for a Monument permit must comply with all applicable laws. The unified Monument permitting system was specifically developed to address and incorporate the differences. For example, sustenance fishing is not allowed in state waters.

Research

Research permits are required for activities designed to enhance understanding of Monument resources and activities to improve resource management decisionmaking. Priority is given to research proposals that help meet the management needs of the Monument and its Co-Trustees, as identified in this Monument Management Plan or the Monument Natural Resources Science Plan (see Section 3.1.1, Marine Conservation Science Action Plan). The types of activities that can be conducted under a research permit include, but are not limited to, biological inventories, ecosystem-based research, restoration investigations, cultural studies, and terrestrial and marine archaeological research.

In the event sampling is requested, research proposals will be evaluated to ensure proposed sample sizes allow for the effective application of statistical techniques while minimizing harm to the population or ecosystem under study. Collection of samples must be justified and meet Proclamation findings.

Education

Education permits are required for activities that further the educational value of the Monument. Educational activities may enhance the understanding of the NWHI ecosystems, improve resource management decisionmaking, promote Native Hawaiian knowledge and values, or aid in enforcement and compliance efforts. Permits are considered for activities that have clear educational or public outreach benefits to understand Monument resources or management and that promote “bringing the place to the people rather than the people to the place.” Some examples of potentially eligible projects are teacher-at-sea programs, distance learning projects, and university classes.

Conservation and Management

Conservation and management permits are required for general management of the Monument. This may include activities associated with resource management, such as field station operations, benthic mapping, habitat characterization, marine debris removal, development and maintenance of infrastructure, species and habitat restoration, and long-term resource monitoring programs such as monitoring of endangered species and seabird populations, and terrestrial native plant communities (see Section 3.2.3, the Habitat Management and Conservation, Section 3.2.2, Migratory Bird, and Section 3.2.1, Threatened and Endangered Species action plans). Conservation and management permits provide a mechanism to respond and follow up to urgent events in the Monument that may not have been anticipated, such as response to vessel groundings, coral bleaching episodes, and invasive species detection.

Native Hawaiian Practices

Permits are required for Native Hawaiian cultural practices. The Native Hawaiian Cultural Working Group, working closely with the Office of Hawaiian Affairs, is currently developing a process whereby permit applications will be reviewed by select cultural practitioners or cultural resource managers. The findings and criteria in Proclamation 8031 and regulations (see Appendices D and E) state that Native Hawaiian Practice permits must be noncommercial, deemed appropriate and necessary by traditional standards, benefit the NWHI and Native Hawaiian community, perpetuate traditional knowledge, and restrict the consumption of harvested resources from the Monument. Permit conditions and protocols will continue to be developed by the Co-Trustees and the Office of Hawaiian Affairs through consultation with the Native Hawaiian Cultural Working Group and the Native Hawaiian community, as appropriate. (See Section 3.1.2, the Native Hawaiian Culture and History, and Section 3.5.3, Native Hawaiian Community Involvement Action Plans.)

Special Ocean Use

Special ocean use permits are required for projects related to commercial ocean uses, including ecotourism and documentary filmmaking that have a net benefit to the Monument. Special ocean use is defined as any activity or use of the Monument that is engaged in to generate revenue or profits for one or more of the persons associated with the activity or use. These permits are not restricted to activities in the ocean.

Special ocean use permits must meet the additional findings stated in Monument regulations (see Appendix D). These findings include the requirement to provide public notice for any activity not previously identified as a special ocean use and all activities being considered as special ocean use for locations outside of Midway. In addition, the Co-Trustees will authorize the conduct of a special ocean use permit activity only if the activity is compatible with the purposes for which the Monument is designated and is consistent with the protection of Monument resources. Special ocean use permits for activities being permitted for the first time will be restricted to pilot projects. Pilot projects will be closely monitored and restricted in duration. Only after a pilot project for the category has been determined by the Co-Trustees to meet the criteria in Proclamation 8031 can subsequent special ocean use permits be issued for the category of activity. Activities that could qualify as another permit type (e.g., research or education) but that directly generate revenue or profit for one of the persons involved in the activity must be permitted as special ocean use. Furthermore, special ocean use proposals involving activity outside of the Midway Atoll Special Management Area must be for educational or research purposes that directly benefit the conservation and management of the Monument. These activities may not involve use of a commercial passenger vessel, defined in the Monument regulations as “a vessel that carries individuals who have paid for such carriage.”

Recreation

Recreational permits are required for all recreational activities and are limited to the Midway Atoll Special Management Area. In addition to the general findings, recreational activities may not be associated with any for-hire operation or involve any extractive use. Examples of activities that may be permitted under a recreational activity permit include snorkeling, SCUBA diving, wildlife viewing, and kayaking.

FWS, in close consultation with the MMB, has updated the Interim Visitor Services Plan for the Midway Atoll National Wildlife Refuge, the Battle of Midway National Memorial, and the Papahānaumokuākea Marine National Monument's Midway Atoll Special Management Area (see Section 3.4.3, the Midway Atoll Visitor Services Action Plan, and Appendix B). This plan details the types of recreational activities permitted within the Midway Atoll Special Management Area. This plan also describes the permitting process for recreational activities, the number of annual recreational visitors expected within the Midway Atoll Special Management Area, and accommodations on Midway Atoll.

Findings and Review Criteria

Monument findings and review criteria must be met by all applicants to demonstrate that their proposed activities are consistent with the Proclamation and the goals of the Monument (see Section 2, Management Framework). The MMB may require applicants to submit additional information, apply special conditions, or undergo additional training. To issue a permit, the Secretaries must determine the following:

- The activity can be conducted with adequate safeguards for the resources and ecological integrity of the Monument.
- The activity will be conducted in a manner compatible with the management direction of the Proclamation, considering the extent to which the conduct of the activity may diminish or enhance Monument resources, qualities, and ecological integrity; any indirect, secondary, or cumulative effects of the activity; and the duration of such effects.
- There is no practicable alternative to conducting the activity within the Monument.
- The end value of the activity outweighs its adverse impacts on Monument resources, qualities, and ecological integrity.
- The duration of the activity is no longer than necessary to achieve its stated purpose.
- The applicant is qualified to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.
- The applicant has adequate financial resources available to conduct and complete the proposed activity and mitigate any potential impacts resulting from its conduct.
- The methods and procedures proposed by the applicant are appropriate to achieve the proposed activity's goals in relation to their impacts to Monument resources, qualities, and ecological integrity.
- The applicant's vessel has been outfitted with a mobile transceiver unit approved by NOAA Office of Law Enforcement and complies with the requirements of Proclamation 8031.
- There are no other factors that would make the issuance of a permit for the activity inappropriate.

Additional findings are required for Native Hawaiian Practices, special ocean use, and recreation applications. See Appendix D for additional findings from regulations.

Permit applications include requests for information that will assist the Co-Trustees in determining how the proposed activities are compatible with conservation and management of all of the resources of the Monument: natural, historic and cultural.

Permit General Terms and Conditions

Permitted activities are subject to general terms and conditions that satisfy Proclamation 8031 and Monument regulations (see Appendices D and E) and comply with MMB agency mandates and policies. All authorized permits must meet all applicable federal and state regulations. As previously mentioned, those mandates and policies that are not met within the general permit terms and conditions are addressed by special conditions. General terms and conditions in Monument permits address the following categories, as required by Monument regulations, Proclamation 8031, and other MMB agency mandates and policies:

- Monthly, annual, and summary reporting
- Submittal of a copy of all data acquired under each respective Monument permit
- Adherence to all federal, state, and local laws and regulations
- Coordination with Monument staff while in the field
- Prohibition of alcohol possession and consumption in Hawaiian Islands NWR
- Adherence to hazardous material storage and transport guidelines
- Requirement to demonstrate proof of insurance, or financial capability to cover evacuation in the event of an emergency, medical evacuation, or weather
- Requirement for permittees to attend a cultural briefing on the significance of Monument resources to Native Hawaiians
- Prohibition against the disturbance of any cultural or historic property.

Additional terms for entering the Monument via vessel:

- Maintenance of cruise log
- Notification of entry and exit
- Requirement to demonstrate proof of vessel hull, tender, gear, ballast water, and rat inspections
- Vessel Monitoring System requirements.

Permit Special Terms and Conditions

Each permit may contain special terms and conditions that place additional restrictions on the permitted activity to minimize or eliminate impacts to Monument resources or qualities. Permits may contain terms and conditions addressing sustenance and subsistence fishing reporting requirements, permitted activity locations, scientific collection methods, maintenance and retrieval of temporary structures in the Monument, or disinfection of gear and collecting equipment between permitted activity locations. Special terms and conditions are placed in permits depending on the nature of the permitted activity request and the location and duration of activities permitted to take place in the Monument. For example, all permits that involve collection of samples or specimens contain a special condition prohibiting the sale of the organisms collected, as well as the use or sale of any organisms, by-product, or materials collected within the Monument for obtaining patent or intellectual property rights.

One definition of bioprospecting is the search for new chemicals compounds, genes and their products in living things that will have some value to people. This inherently involves the identification of biological resources with potential commercial value that may be developed into marketable commodities such as pharmaceuticals, pesticides and cosmetics. Thus these conditions, applied to all permits, in effect prohibit bioprospecting for commercialization or for obtaining patent or intellectual property rights for organisms collected within the Monument.

Permit Tracking

The MMB will track and monitor all permitted activities to evaluate potential impacts to Monument resources. A multiagency-accessible database that records and tracks information on all Monument permits is currently under development. Application and reporting data from all permits will provide information on the nature, extent, and location of activities occurring in the Monument. This information is essential for managers to make informed decisions about evaluating types and locations of activities proposed in the Monument. It also provides necessary information to conduct a geospatial assessment of impacts and to assess cumulative impacts over time. The tracking system will also provide data essential for conducting a threat assessment for the Monument.

Need for Action

The Monument is a vast protected natural area, largely uninhabited by humans, and rich in biodiversity, history, and culture. The NWHI have a history of Native Hawaiian cultural access and practices, as well as protections interspersed with periods of commercial exploitation and military use. With the advent of new technology and dedicated resources, there is increased awareness and interest in the region. Access to the Monument for all activities, with limited exceptions, requires a Monument permit.

The Monument permit program allows for a comprehensive review of proposed activities and will be administered to ensure compliance with Presidential Proclamation 8031, as well as other applicable federal and state laws and regulations. Efforts are ongoing to make the permitting process more efficient for applicants, the MMB, and the public while maintaining safeguards for the ecosystem. The following strategies and activities are designed to ensure that the permit program is refined in accordance with Monument requirements and policies within existing law and that permit data are effectively tracked and collected for management purposes.

Strategies to Achieve the Desired Outcome

Three strategies have been identified to achieve the desired outcome to implement an effective and integrated Monument permit program that manages, minimizes, and prevents negative human impacts by allowing access only for those activities consistent with the purpose of the Monument. The strategies and activities are coded with the letter “P,” for “Permitting.” A summary of strategies and activities is provided in Table 3.4.1 at the end of this action plan.

- P-1: Refine, implement, and improve the permit process to integrate all state and federal regulations into a single permitting process on an ongoing basis.
- P-2: Track and monitor permitted activities and their impacts.
- P-3: Coordinate information, outreach, and education regarding Monument permits and regulations.

Strategy P-1: Refine, implement, and improve the permit process to integrate all state and federal authorities into a single permitting process on an ongoing basis.

The strategy of the Monument permitting program is to integrate the previous three jurisdictionally based permitting programs into one. A joint permit application, application

instructions, and a permit template were approved and implemented (see Appendix A). The permitting program for the Monument allows for a comprehensive review of proposed activities to ensure compliance with the regulatory provisions of the Proclamation as well as other applicable federal and state laws and regulations. Efforts are ongoing to make the permitting process more efficient for both applicants and MMB while maintaining safeguards for the natural, cultural, and historic resources of the Monument.

Activity P-1.1: Effectively and promptly review permit applications to ensure informed permit-related decisionmaking across Co-Trustee agencies.

Monument staff serve as the central portal through which all permit inquiries and applications are received and processed. These staff will continue to work together to discuss and coordinate permit assessment and review efforts by each Trustee agency. Monument staff will bring all permits and permit-related issues before the MMB on a regular basis for discussion and decisionmaking.

Activity P-1.2: Refine and update the permit application, instructions, and permit template through feedback from permittees and other users.

The permit application was developed with extensive input from legal counsel and the MMB to meet agency requirements. Each year, the permit application, instructions, and template will be evaluated and updated based on lessons learned from the previous year. In addition, feedback from permittees and applicants will be gathered on an annual basis to maintain the most efficient and comprehensible permit program possible.

Activity P-1.3: Coordinate appropriate environmental review for all permitted activities.

NEPA, the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), and Chapter 343, Hawai‘i Revised Statutes (“Environmental Impact Statements”), are planning tools used to integrate environmental concerns into federal and state actions and programs, using environmental quality as the essential component. NEPA requires federal agencies to consider the impacts of their actions on the natural and human environment prior to making final management decisions. Hawai‘i requires additional analysis on state agency actions’ potential impacts on the state’s resources, Native Hawaiian culture, and traditional and customary rights. The issuance of Monument permits requires environmental review compliance in the form of one of three documents: Environmental Impact Statements, Environmental Assessments, or Categorical Exclusions. When state agency actions are involved in a permit, a Cultural Impact Assessment is also required. Currently, the federal Co-Trustees follow their individual agency procedures to ensure appropriate environmental review for all permitted activities. However, the Monument staff, along with the MMB and other Co-Trustee experts, will work to develop an efficient integrated process by which all Co-Trustee agencies can continue fulfilling their respective environmental review requirements and effectively document compliance for every Monument permit.

Activity P-1.4: Engage outside experts in review of permit applications.

External reviews of Monument permit applications can provide valuable and unbiased technical evaluations of proposed activities. The MMB utilizes experts to consult on permit applications.

This practice will continue by identifying and engaging a pool of experts trained in Monument-related subject matter including culture, policy, purpose, and proclamation findings.

Activity P-1.5: Investigate individual and vessel insurance and other avenues to fund mitigation of any damages associated with permitted activities.

Activities conducted throughout the Monument pose varying degrees of risk to the resources of the Monument. Medical evacuations, vessel groundings, alien species introductions, and hazardous material spills are among the possible scenarios that might be mitigated by some form of insurance. The MMB will develop joint criteria for insurance that may be required before a permit authorizes activities in the Monument.

Strategy P-2: Track and monitor permitted activities and their impacts.

Detailed tracking of all permitted activities assists the Monument Co-Trustees in making informed decisions about the types and locations of activities permitted in the Monument. It also provides necessary information to conduct a geospatial assessment of impacts and to assess cumulative impacts over time.

Activity P-2.1: Develop a Geographic Information System-based permit tracking system.

The Monument will develop a GIS-based system to track and monitor NWHI permit data to aid enforcement and management decisions. This system and associated data will be established to integrate into the Co-Trustee agencies' individual databases. Each agency will enter and document permit data consistent with the individual agency's requirements. Through data-sharing agreements which are consistent with applicable federal and state laws and confidentiality considerations, the GIS-based tracking system will include partner agency information to ensure a comprehensive portrayal of activities in the region (see the Information Management Action Plan, Section 3.6.2). The MMB will also work together to provide input on cruise dates and locations and shared resources to prevent redundancy (see the Coordinated Field Operations Action Plan, Section 3.6.3).

Activity P-2.2: Analyze permit data to inform management decisionmaking.

The extent to which current and future levels of activity in the NWHI have the potential to cause cumulative impacts on the ecosystem is an active area of investigation. To assist in ecosystem-based management decisionmaking, a system will be developed to analyze data generated from each permit application and reporting requirements to provide the insight needed to make informed management choices about appropriate levels and locations of permitted activities. This system will allow Monument Co-Trustees and partners to better understand uses and use patterns in the Monument and to develop methodology for assessing the cumulative impacts caused by various activities. Analyses conducted with these data will also be used to modify reporting requirements and make them more relevant, as well as aiding enforcement and other program area planning efforts. In addition to being used to assess the cumulative impacts of the human activities, the data will also be used in the development of a Monument threat assessment (see EN-2.1).

Special ocean use permits issued as pilot projects will require additional tracking to develop an understanding of how often each category of special ocean use activity occurs in the Monument,

as well as the location of these activities. This information will be used to conduct ecological and socioeconomic evaluations to aid in management decisions on authorizing future special ocean use permits.

Activity P-2.3: Analyze permit data for patterns of compliance.

The MMB will regularly review permit files for patterns of compliance, and compliance will be evaluated every two years (see the Enforcement Action Plan, Section 3.4.2). Specifically, the MMB should undertake a technical analysis of the effectiveness and consistency of the permits that were issued compared to the permitting criteria. Permit criteria, permits issued, applications processed, and patterns of use which will be evaluated.

Activity P-2.4: Develop and implement a Monument reporting process.

Permits are issued based on regulatory requirements as well as proclamation findings and other criteria established by the MMB to assist with permit reviews. One of those criteria is the submittal of reports. An integrated MMB review of the follow-up process is needed to ensure that reports are complete and submitted on time. Additional follow-up includes recording data, ensuring that the results of research are made available, ensuring the systematic reporting of sustenance fishing, and ensuring adherence to regulations and laws. Follow-up may also require compliance visits from enforcement agents.

Strategy P-3: Coordinate information, outreach, and education regarding Monument permits and regulations.

Information, education, and outreach are important aspects of the Monument permitting program. Strategies have been developed to ensure that the public is kept informed of Monument regulations and permit requirements. These strategies are geared toward achieving the highest degree of user compliance and assistance, while fostering a broader public understanding of the NWHI ecosystem and cultural values. Coordination will be conducted across partner agencies to ensure that the public is engaged in and informed of the Monument permitting program. In addition, the MMB has established and will maintain a policy to ensure the public is informed of activities proposed to occur in the Monument.

Activity P-3.1: Develop and implement a permit and regulatory education program.

Many of the action plans include educational or outreach activities related to permitting or regulations, such as the Enforcement (Section 3.4.2), Ocean Ecosystems Literacy (Section 3.5.4), Midway Atoll Visitor Services (Section 3.4.3), Native Hawaiian Culture and History (Section 3.1.2), Alien Species (Section 3.3.2), and Maritime Transportation and Aviation (Section 3.3.3) action plans. Monument staff will work together to ensure that the educational activities proposed in these action plans are integrated to provide a consistent and effective message.

Activity P-3.2: Develop and implement a Native Hawaiian cultural education program for permit applicants.

The MMB will develop and implement an educational program that can be provided online from the Monument web page, which will educate prospective applicants about the Native Hawaiian culture. Those interested in applying for a Monument permit may complete the educational program before submitting their application for review. This educational program will also provide avenues for

additional knowledge gathering should the applicant wish to delve deeper into the Hawaiian culture and develop a greater understanding of the values of the Monument.

Activity P-3.3: Coordinate permitting outreach.

Additional information and outreach will aid interagency permitting efforts and better inform the public about Monument permitting. Information on the permitting process will be posted on Monument websites, including application forms and instructions. This information will reduce delay and confusion for applicants, the public, and agencies as they plan for activities in the Monument. Outreach materials such as presentations, publications, and DVDs will be designed to aid public understanding of agency regulatory and permitting responsibilities. In addition, individual MMB agencies will further exchange information on their roles and responsibilities so that each may better understand and explain permitting requirements.

Activity P-3.4: Develop a pre-access training and briefing program.

Pre-access training is an important component of all permitted activities. Pre-access training is required for all those planning to enter the Monument for the first time. Several MMB agencies have formal and informal training mechanisms already in place. Many activities conducted in the Monument will span multiple agencies; thus, the MMB will work with Monument staff to develop a comprehensive pre-access training and briefing program that is appropriate for a variety of activities and locations within the Monument. This training will include information on the proclamation regulations, permit terms and conditions, reporting requirements, the significance of the NWHI to Native Hawaiians, and ways to best conduct activities to reduce human impacts to the natural environment and cultural resources. The training program will build on protocols and materials already in place by FWS, the State of Hawai‘i, and NOAA. For those users who have already undergone pre-access training, shorter update briefings will be developed to ensure that all users have the most up-to-date information on the Monument rules and policies.

Activity P-3.5: Regularly update the public on proposed and permitted activities.

The MMB is committed to keeping the public engaged and informed on a regular basis on all proposed and permitted activities that will be conducted in the Monument. To ensure broad dissemination to the public, Co-Trustees will share a single URL address that will be designated as the Monument website. This site will be the location for the public to access information regarding the Monument, including information on the Monument permit program. Information such as lists of permitted activities along with associated permit reports, publications, and productions will be made available or referenced on the Monument website. It will also serve as a primary point of access to notify the public of proposed activities to be conducted in the Monument, as both permit summaries and permit applications will be posted (see Appendix A). As required by the Federal Privacy Act, the privacy of individual applicants will be protected, and all sensitive information will be removed from the permit application prior to public posting. Additional opportunities for the public to be notified and comment on Monument permit applications include:

- Special ocean use permit applications are posted for public notice and comment 30 days prior to the issuance of a permit (Monument regulations, 50 CFR Part 404.11).

- Environmental reviews (e.g., environmental impact statements, environmental assessments, and compatibility determinations) related to Monument permit applications are posted for public comment.
- Monument permit applications that include proposed activities within the state's Northwestern Hawaiian Islands Marine Refuge are posted to the Board of Land and Natural Resources (BLNR) website for 7 days prior to the scheduled BLNR meeting as part of the overall Land Board submittal.

Table 3.4.1 Summary of Strategies, Activities, and Agency Leads for Permitting

Strategies and Activities	Agency Lead
Strategy P-1: Refine, implement, and improve the permit process to integrate all state and federal authorities into a single permitting process on an ongoing basis.	
Activity P-1.1: Effectively and promptly review permit applications to ensure informed permit-related decisionmaking across Co-Trustee agencies.	NOAA
Activity P-1.2: Refine and update the permit application, instructions, and permit template through feedback from permittees and other users.	NOAA
Activity P-1.3: Coordinate appropriate environmental review for all permitted activities.	NOAA
Activity P-1.4: Engage outside experts in review of permit applications.	NOAA
Activity P-1.5: Investigate individual and vessel insurance and other avenues to fund mitigation of any damages associated with permitted activities.	
Strategy P-2: Track and monitor permitted activities and their impacts.	
Activity P-2.1: Develop a Geographic Information System-based permit tracking system.	NOAA
Activity P-2.2: Analyze permit data to inform management decisionmaking.	NOAA
Activity P-2.3: Analyze permit data for patterns of compliance.	NOAA
Activity P-2.4: Develop and implement a Monument reporting process.	NOAA
Strategy P-3: Coordinate information, outreach, and education regarding Monument permits and regulations.	
Activity P-3.1: Develop and implement a permit and regulatory education program.	NOAA
Activity P-3.2: Develop and implement a Native Hawaiian cultural education program for permit applicants.	OHA
Activity P-3.3: Coordinate permitting outreach.	NOAA
Activity P-3.4: Develop a pre-access training and briefing program.	NOAA
Activity P-3.5: Regularly update the public on proposed and permitted activities.	NOAA

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3.4.2 Enforcement Action Plan

Desired Outcome

Achieve compliance with all regulations within Papahānaumokuākea Marine National Monument.

Current Status and Background

The three principal entities with responsibility for managing lands and waters of the Monument—NOAA, FWS, and the State of Hawai‘i—are working cooperatively to administer Monument policies and regulations. This role and the relationships among the three Co-Trustees are further described in a Memorandum of Agreement among the Co-Trustees that provides the general terms and conditions under which they will cooperate. Particular to enforcement activities, the Memorandum of Agreement directs the cooperating agencies to coordinate research and monitoring efforts to better understand and address major threats to Monument resources; to provide access and support for enforcement purposes; share enforcement resources and data, as appropriate; and develop joint enforcement capabilities as needed to ensure compliance with applicable state and federal laws. It also gives the agencies the ability to develop additional interagency agreements, grants, memoranda of understanding, or other appropriate instruments that allow for ease in sharing resources, including funds as appropriate, and a sharing of in-kind assistance and support—such as the sharing of vessel time, aircraft missions, or other logistical support—as a means of facilitating cooperation.

In addition to the federal and state laws in place prior to the establishment of the Monument, NOAA and FWS promulgated joint regulations (50 CFR Part 404, see Appendix D) that implement the provisions of the President’s Proclamation. These regulations were issued under NOAA and FWS statutory authorities.

Need for Action

The size and remote location of the NWHI present challenges to enforcement. The Monument is the largest conservation area under U.S. jurisdiction. An effective law enforcement program is needed to protect and conserve Monument resources. The primary aim of the Monument enforcement program is for the jurisdictional partners to achieve resource protection by gaining compliance with all applicable laws and regulations. Increased law enforcement capacity will move agency partners toward more effective enforcement of all federal and state rules that protect the Monument’s resources.

Managers and law enforcement personnel must work together to prioritize and initiate appropriate activities that will have the greatest impact. Depending on the complexity and breadth of a particular enforcement activity, a single agency may not have the manpower or other resources to commit to the effort. Opportunities to efficiently and economically accomplish priority enforcement activities in the Monument must be optimized.

All activities within the Monument, with the limited, specific exceptions discussed in the Permitting Action Plan (Section 3.4.1), require a permit. In addition, all activities within the Monument, including the transit of vessels, present varying degrees of threat to Monument

Links to other Action Plans	
3.3.2	Alien Species
3.4.1	Permitting
3.5.1	Agency Coordination
3.5.4	Ocean Ecosystems Literacy
3.6.2	Information Management

Links to goals
Goal 1
Goal 2
Goal 3

resources and varying potential for noncompliance with Monument rules and regulations. To increase voluntary compliance, outreach tailored to address these threats will be emphasized. Informing the permitted and potential users, as well as the general public, about the Monument resource threats and the regulations in place to protect them is important to ensure responsible behavior before resources can be adversely impacted.

Strategies to Achieve Desired Outcome

Effective law enforcement is an essential component to fulfill the overall management vision to protect Monument resources. The enforcement of regulations in the remote Monument can be difficult and time consuming. Natural barriers to law enforcement, such as remoteness and distance from operating bases, must be overcome.

Enforcement capabilities utilized to monitor activity and detect violations within the Monument will include traditional strategies such as patrols by vessel and aircraft. However, the application of emerging technologies will also be necessary to assure the comprehensive coverage of this vast area. Though Vessel Monitoring Systems (VMS) are currently being utilized, the potential use of other technological capabilities such as satellite based surveillance, remote sensors, or use of unmanned aircraft (drones) will need to be researched further to determine if such use is practical and feasible, and if so, how they may be used.

VMS are prevalent in commercial fisheries and are required to be carried by all vessels permitted to operate in the Monument. VMS is useful to monitor the locations and travel of vessels so equipped; however, to assure viable deterrence and compliance, it is important to establish the capacity to intercept and make at-sea contact with vessels actively engaged in activities that constitute a violation, particularly those not equipped with VMS that cannot be tracked or monitored remotely. This is an area that will rely upon an enforcement partner, the U.S. Coast Guard, to play a key role.

Outreach is an essential part of any law enforcement program. Community Oriented Policing and Problem Solving (COPPS), also referred to as “interpretive enforcement,” is a key component to the Monument law enforcement strategy. The goal is to inform Monument users and the general public about the regulations and allowed activities, as well as educate them about the detrimental effects of illegal activities on Monument natural, cultural, and historic resources and the surrounding environment. This goal can be accomplished through focused workgroups with regular and potential permit applicants, public forums, printed materials, interpretive signs, displays, and public service announcements.

This action plan contains three management strategies to achieve the desired outcome of achieving compliance with all regulations within the Monument. The strategies and activities are coded by the abbreviation for the action plan title, “Enforcement” (EN). A summary of strategies and activities is provided in Table 3.4.2 at the end of this action plan.

- EN-1: Increase law enforcement capacity and integration over the life of the plan.
- EN-2: Implement a threat-based detection and monitoring program within 2 years.
- EN-3: Develop and implement a multiagency COPPS/interpretive enforcement program within 2 years.

Strategy EN-1: Increase law enforcement capacity and integration over the life of the plan.

This strategy undertakes the activities required to increase the capacity (i.e., quantity and quality of services) of the law enforcement agencies, promote cooperation among these agencies, and build on existing resources to execute an integrated law enforcement program in the Monument.

Standard operating procedures will increase the efficiency of law enforcement activities and may include monitoring responsibilities, coordinating response to intelligence handling of possible violations, standardizing communications, and reporting activities.

Activity EN-1.1: Charter a Monument law enforcement working group.

A successful Monument law enforcement program must have active involvement and oversight by each of the law enforcement agencies that have responsibilities in the NWHI. The primary law enforcement team entities for the Monument are NOAA Office of Law Enforcement, NOAA Office of General Counsel for Enforcement & Litigation, FWS Office of Law Enforcement and National Wildlife Refuge System Law Enforcement, U.S. Attorneys, U.S. Coast Guard, and Hawaii DLNR - Division of Conservation and Resource Enforcement, Hawaii Attorney General's Office. Numerous other agencies have enforcement authority and will be consulted as appropriate. Staff from these agencies, primarily credentialed law enforcement officers, will form the Monument law enforcement group. The group will meet regularly to (1) coordinate enforcement-related tasks for each agency in support of this plan, (2) develop operating protocols, and (3) assist in evaluating the overall effectiveness of law enforcement efforts.

Activity EN-1.2: Develop necessary interagency agreements.

Effective law enforcement in the Monument would be enhanced by the establishment of formal agreements between law enforcement agencies. At the national level, NOAA and FWS share agreements on enforcement. Cooperative enforcement agreements at a regional level would allow law enforcement officers of partner agencies to enforce statutes under each other's authorities. The MMB will discuss opportunities to formalize Coast Guard support through a memorandum of agreement or other means. Officers of partner agencies can be dedicated to Monument efforts with appropriate funding. For the most effective use of scarce resources on the part of all agencies, law enforcement officers should seek ways to maximize collaboration.

Activity EN-1.3: Develop an integrated law enforcement training program.

Training courses will be conducted by Monument staff to ensure that all law enforcement personnel have the most up-to-date information, including environmental education and Native Hawaiian cultural practices. Enforcement personnel must understand the environmental consequences that could occur as a result of violations. In addition, environmental training will enhance the ability of these officers to provide outreach.

Activity EN-1.4: Assess Monument law enforcement capacity and program effectiveness.

The Monument law enforcement working group will assess the effectiveness of ongoing law enforcement activities, including analyzing efforts to determine if there are any "hot spots" that require focus. On an annual basis, the group will present a formal briefing to the MMB on

ongoing and planned activities, consider new technologies, and discuss potential opportunities for new personnel and sharing law enforcement resources.

Activity EN-1.5: Increase law enforcement capacity on Midway Atoll within two years.

As a predicted hub of activity for the Monument and the site of the only authorized recreational activities, Midway Atoll will be a major access point into the Monument. Presence of credentialed officers at Midway Atoll is necessary to ensure visitor and staff safety, regulatory compliance, and enforcement. Midway is unique in that it is located outside the State of Hawai‘i and, as such, regulations are in place to direct public civil obedience (50 CFR Part 38).

Strategy EN-2: Implement a threat-based detection and monitoring program within 2 years.

Before surveillance resources can be effectively deployed Monument-wide, law enforcement agencies should accurately assess current existing threats. Threats to be assessed include the potential for regulatory violations as well as the potential for resource damage. Once threats are well described, the law enforcement agencies can orient detection and monitoring activities toward the highest-priority areas. Traditional surveillance methods (aircraft and vessel patrols), electronic sensors (land and satellite-based), and automated monitoring (VMS) should be implemented immediately, where needed, to detect violations and resource threats. If needed, expansion of the program to include high-tech and emerging remote surveillance technologies (e.g., unmanned aerial vehicles) may bring long-term cost savings.

Activity EN-2.1: Conduct a comprehensive threat assessment and draft an enforcement plan.

It is important to analyze the level and types of activities occurring throughout the Monument, and then assess the potential for violations and threats to Monument resources. Multiple sources of information should be accessed to analyze vessel and activity patterns. The MMB has already initiated a threat assessment in late 2007 that will continue through 2008 and will include cost-benefit analyses of applicable technologies and solutions. The Monument law enforcement working group will collaborate on this threat assessment and subsequent enforcement plan. The plan will identify effective means of coordination, opportunity for further collaboration and efficient use of limited resources.

Activity EN-2.2: Operate a Vessel Monitoring System for all permitted vessels.

A mandatory monitoring system for all permitted vessels was identified as one of the most critical components of a successful law enforcement program in the NWHI. NOAA Office of Law Enforcement will maintain and operate a VMS to monitor compliance with Monument regulations (50 CFR Part 404).

Activity EN-2.3: Integrate additional automated monitoring systems and ship reporting systems for all vessels transiting the Monument.

Existing automated monitoring and ship reporting systems will be utilized for vessels transiting the monument and that are so equipped. Many “larger” vessels are required to carry and utilize Automated Identification Systems. As mandated through the Maritime Transportation Security Act, the use of Automated Identification Systems is required on all commercial vessels longer than 65 feet. As Coast Guard and Naval researchers develop and expand the systems to collect,

manage (sort), and distribute this information through shore based and satellite technologies, its use may be an effective tool to monitor ship traffic within and around the monument.

Activity EN-2.4: Increase available platforms to support law enforcement.

On-the-water presence will help to ensure that users of Monument resources are deterred from willful or inadvertent violations and will place law enforcement personnel in a better position to respond to violations and other resource emergencies. Because of the remoteness of this area, increased aerial and ship-based resources, both for surveillance and for response, are needed. The Monument law enforcement working group will identify existing platforms that could be used if deemed necessary to increase enforcement, surveillance, and response; as well as to develop proposals to acquire new assets if feasible.

Strategy EN-3: Develop and implement a multiagency COPPS/interpretive enforcement program within 2 years.

COPPS and interpretive enforcement are approaches that seek voluntary compliance with Monument regulations, primarily through education of users about existing regulations, why and how they apply, and how users can play a role in protecting Monument resources. The primary objectives of interpretive law enforcement are to protect Monument resources by increasing the public's understanding of the importance of Monument regulations and to inform the public through educational messages and literature about responsible behavior. On-site methods will be used to reach the public with educational messages. For example, Monument enforcement officers will deliver interpretive programs both onsite and in the main Hawaiian Islands, targeting specific user groups. Reaching out to the community through educational messages and literature is a cost-effective, prevention-oriented measure to reduce the number of violations and foster a sense of stewardship among Monument users.

Activity EN-3.1: Integrate regulations briefings into pre-access training required for all Monument users.

As part of pre-access briefings for all users of the Monument, training programs will be developed to inform users of regulations, permit requirements, and best management practices. Working closely with partner agencies and in consultation with the NWHI enforcement group, specific information on all applicable laws will be developed for these workshops. Workshop materials will include videos, printed materials, and presentations (see the Permitting Action Plan, Section 3.4.1, and Alien Species Action Plan, Section 3.3.2).

Table 3.4.2 Summary of Strategies, Activities, and Agency Leads for Enforcement

Strategies and Activities	Agency Lead
Strategy EN-1: Increase law enforcement capacity and integration over the life of the plan.	
Activity EN-1.1: Charter a Monument law enforcement working group.	NOAA
Activity EN-1.2: Develop necessary interagency agreements.	NOAA
Activity EN-1.3: Develop an integrated law enforcement training program.	NOAA
Activity EN-1.4: Assess Monument law enforcement capacity and program effectiveness.	NOAA
Activity EN-1.5: Increase law enforcement capacity on Midway Atoll within 2 years.	FWS
Strategy EN-2: Implement a threat-based detection and monitoring program within two years.	
Activity EN-2.1: Conduct a comprehensive threat assessment and draft an enforcement plan.	NOAA
Activity EN-2.2: Operate a Vessel Monitoring System for all permitted vessels.	NOAA
Activity EN-2.3: Integrate additional automated monitoring systems and ship reporting systems for all vessels transiting the Monument.	NOAA
Activity EN-2.4: Increase available platforms to support law enforcement.	NOAA
Strategy EN-3: Develop and implement a multiagency COPPS/interpretive enforcement program within two years.	
Activity EN-3.1: Integrate regulations briefings into pre-access training required for all Monument users.	NOAA

3.4.3 Midway Atoll Visitor Services Action Plan

Desired Outcome

Offer visitors opportunities to discover, enjoy, appreciate, protect, and honor the unique natural, cultural, and historic resources of Papahānaumokuākea Marine National Monument.

Links to other Action Plans	
3.4.1	Permitting
3.5.2	Constituency Building and Outreach
3.5.4	Ocean Ecosystems Literacy
3.6.3	Coordinated Field Operations

Current Status and Background

Since 1995, FWS has been strongly committed to welcoming visitors to Midway Atoll. This island is the first and only remote NWR in the Pacific to provide the general public with an opportunity to learn about and experience these unique ecosystems. With the establishment of the Monument, Midway Atoll takes on the additional role of providing a “window” so that visitors can learn about and enjoy a small portion of the largest fully protected marine managed area in the world.

Links to Goals
Goal 3
Goal 4
Goal 5
Goal 7
Goal 8

A regularly scheduled visitor program operated on Midway Atoll from 1995 until early in 2002, but ended when the FWS cooperator left the atoll. Since then, visitors have arrived almost exclusively by the occasional cruise ship or sailboat, or for a Battle of Midway commemorative event. In May 2007, the FWS approved an interim visitor services plan to guide a small-scale visitor program on Midway Atoll until the Monument Management Plan is completed. In January 2008, a regularly scheduled visitor program began, offering limited opportunities for people to experience Midway’s wildlife and history.

As part of the interim visitor services plan and in accordance with the National Wildlife Refuge System Administration Act of 1966, the following wildlife-dependent recreational uses were determined to be compatible at Midway Atoll Special Management Area and National Wildlife Refuge: wildlife observation and photography, environmental education and interpretation, and participatory research. Hunting and fishing, which normally are given priority on national wildlife refuges if they are determined to be compatible, will not take place at Midway Atoll. All animal species are protected by law or occur in numbers too low for harvest to allow hunting opportunities. Recreational fishing is precluded under the Presidential Proclamation designating the Monument. Additional compatibility determinations allow for nonwildlife-dependent beach use activities such as swimming and volleyball, nonadministrative airport operations, limited outdoor sports such as bicycling and jogging, and amateur radio use.

Each compatibility determination includes stipulations necessary to ensure protection of Midway’s natural, cultural, and historic resources. These compatibility determinations are valid for 15 years for wildlife-dependent visitor activities and ten years for nonwildlife-dependent activities.

Any additional activities that may be proposed within Midway Atoll NWR would need to be evaluated through the compatibility determination process with formal public review. Activities that are determined to be compatible are authorized through the issuance of Monument permits, which fall within six permit types: conservation and management, research, education, Native Hawaiian practices, special ocean uses, and recreation. The permitting process is discussed in Section 3.4.1, the Permitting Action Plan.

Some strategies and activities outlined in the Midway Atoll Visitor Services Plan are included within other action plans; see the Ocean Ecosystems Literacy (Section 3.5.4), Constituency Building and Outreach (Section 3.5.2), and Coordinated Field Operations (Section 3.6.3) action plans.



Visitors spend part of their time on Midway helping to restore wildlife habitat.

Need for Action

Since the Interim Visitor Services Plan was designed to be in effect only until a Monument Management Plan was completed, this action plan addresses a longer-term visitor services program for Midway Atoll. The interim program was initiated in January 2008, so only minimal updates are included in the Midway Atoll Visitor Services Plan (Appendix B).

The Co-Trustees remain committed to offering a high-quality, small-scale visitor program at Midway Atoll as a “window” to the Monument. The aim is that by physically experiencing the Northwestern Hawaiian Islands, visitors will return home with a personal connection and a commitment to protecting and conserving the Monument’s unique resources.

Strategies to Achieve the Desired Outcome

The Midway Atoll Visitor Services Plan includes numerous detailed activities that constitute the visitor program. Since the reinitiated program is only a few months old, the MMB will be monitoring the program and adapting it as necessary to ensure protection of natural, cultural, and historic resources and visitor safety, accessibility under the Americans with Disabilities Act (ADA), and satisfaction. The strategies and activities are coded by the acronym for the action plan title, “Visitor Services Action Plan” (VS). A summary of strategies and activities is provided in Table 3.4.3 at the end of this action plan.

- VS-1: Implement the Midway Atoll Visitor Services Plan, providing visitor opportunities for up to 50 overnight guests at any one time.

- VS-2: Assess the level of visitor satisfaction, financial stability of the program, staffing needs, and program structure, resulting in recommendations for improvement beginning in 2009 and biennially thereafter.

Strategy VS-1: Implement the Midway Atoll Visitor Services Plan, providing visitor opportunities for up to 50 overnight guests at any one time.

The Midway Atoll Visitor Services Plan extends the interim visitor program that was reinitiated on a regular schedule in January 2008. Most of the same restrictions and stipulations identified in the interim plan have been carried over into this longer-term plan. In light of infrastructure limitations and to ensure a quality program, the maximum number of overnight visitors will be limited to no more than 50 people at any one time; because of transportation availability, that number generally will be from 15 to 30 people. This number of visitors may be exceeded for short-duration prearranged visits (less than one day) by ocean vessels or aircraft.

Activity VS-1.1: Provide visitors with opportunities for wildlife-dependent recreation to enhance their knowledge and appreciation of the Monument's natural resources.

As outlined in the Midway Atoll Visitor Services Plan, visitors will be offered opportunities for guided interpretive tours, wildlife photography, snorkeling, diving, kayaking, and self-guided walks. At few other places in the world can visitors be so totally surrounded by wildlife. Midway's seabirds have little fear of humans, and visitors are offered opportunities to observe and photograph them from the time they arrive until they leave. More sensitive species, such as the Hawaiian monk seal and green turtle, are observed from a distance to ensure they are not disturbed. Snorkeling and diving will allow visitors a glimpse of the Monument's magnificent coral reefs and their inhabitants. The focus of all activities will be educational in nature, and visitors will be encouraged to share their experiences and knowledge when they return to their homes to develop a broader constituency for the Monument.

Activity VS-1.2: Provide visitors with opportunities to learn about and appreciate the Monument's cultural and historic resources.

Visitors will be offered guided interpretive tours, self-guided walks, interpretive exhibits, and written materials that focus on Midway's and the Monument's distinguished human history. In establishing the Battle of Midway National Memorial, FWS was charged with helping others keep knowledge of this important battle alive for future generations. Numerous historic structures on Midway Atoll were present during World War II and serve as reminders of the heroic courage of the men who risked their lives in the midst of the Pacific and turned the tide of the war.

Because it serves as the "window" to the Monument, it is important that interpretation at Midway be broadened to include information about the Northwestern Hawaiian Islands' importance in Native Hawaiian culture. Interpretive exhibits will be developed to reflect all of Midway's "eras," from prerecorded history to Polynesian and Western contact, to shipwrecks and the Commercial Pacific Cable Company days, the Pan American Flying Clipper period, the Battle of Midway, and on through the Cold War and Vietnam conflicts. Additional exhibits will focus on the cultural and historic sites throughout the NWHI, such as the archaeological remains at Nihoa and Mokumanamana and submerged resources throughout the NWHI.

To the extent possible, remnants of these eras will be interpreted as they exist on Midway. To ensure all cultural and historic resources are included in the story, one of the historic buildings on Sand Island will be restored to house a permanent museum and library that will be available to all visitors.

Activity VS-1.3: Continuously monitor the impacts of visitors and other users on wildlife and historic resources to ensure their protection.

Monument staff will monitor the impacts of visitors and other users on wildlife and historic resources to ensure continuing compatibility, as required by Monument and FWS policies. Monitoring methodology to assess impacts on seabirds, Hawaiian monk seals, sea turtles, corals, and fishes has been developed based on previous work on other refuges and protected areas and is included in the Midway Atoll Visitor Services Plan. The visitor program supervisor, in consultation with FWS and NOAA Cultural Resources Program staffs, monitors impacts on historic resources.

Based on FWS experience from 1996 to 2002, when up to 100 overnight visitors were allowed on Midway at any one time, few impacts are anticipated as long as visitors comply with Refuge and Monument rules and regulations.

Strategy VS-2: Assess the level of visitor satisfaction, financial stability of the program, staffing needs, and program structure, resulting in recommendations for improvement beginning in 2009 and biennially thereafter.

A more regularly scheduled visitor program resumed operation on Midway Atoll in January 2008 during development of this Monument Management Plan. After gathering approximately one year of experience and data, Monument staff will be in a better position to make recommendations to improve the program.

Activity VS-2.1: Monitor visitor satisfaction surveys completed by outgoing visitors, adjusting activities, facilities, and maintenance schedules as appropriate on a monthly basis.

The FWS contractor has designed and implemented a visitor satisfaction survey to be completed as visitors depart Midway Atoll. These questionnaires provide valuable insight into how the visitor program could be improved, as well as providing practical information such as room maintenance needed. The information is compiled on a monthly basis and provided to the refuge manager for appropriate action.

Activity VS-2.2: Convene a team of visitor services specialists and Midway Atoll staff to review the visitor program on a biennial basis.

Beginning in March 2009, the team will conduct a visitor services requirements evaluation to assess whether the visitor program is meeting the standards outlined in the Visitor Services Plan, as well as the purposes and goals of the Refuge and Monument, and provide recommendations to management based on their evaluation. The team will also review the results of monitoring visitor activities for impacts to wildlife and historic resources, review financial information relevant to the visitor program to assess the need to adjust visitor fees, and make recommendations on the program's financial stability, including staffing and facility needs.

Activity VS-2.3: Based on the assessment above, seek funding, authority, or other needs to implement the recommendations for improvement.

Depending on the results of the visitor services evaluation, steps will be taken to implement improvements to the visitor program. Possible improvements could include revisions to the Midway Atoll Visitor Services Plan, facility improvements, additional staffing, changes in fee structure, changes to visitor activities or stipulations associated with them, or new implementation structures (such as working through a concessionaire).

Table 3.4.3 Summary of Strategies, Activities, and Agency Leads for Midway Atoll Visitors Services

Strategies and Activities	Agency Lead
Strategy VS-1: Implement the Midway Atoll Visitor Services Plan, providing visitor opportunities for up to 50 overnight guests at any one time.	
Activity VS-1.1: Provide visitors with opportunities for wildlife-dependent recreation to enhance their knowledge and appreciation of the Monument’s natural resources.	FWS
Activity VS-1.2: Provide visitors with opportunities to learn about and appreciate the Monument’s cultural and historic resources.	FWS
Activity VS-1.3: Continuously monitor the impacts of visitors and other users on wildlife and historic resources to ensure their protection.	FWS
Strategy VS-2: Assess the level of visitor satisfaction, financial stability of the program, staffing needs, and program structure, resulting in recommendations for improvement beginning in 2009 and biennially thereafter.	
Activity VS-2.1: Monitor visitor satisfaction surveys completed by outgoing visitors, adjusting activities, facilities, and maintenance schedules as appropriate on a monthly basis.	FWS
Activity VS-2.2: Convene a team of visitor services specialists and Midway Atoll staff to review the visitor program on a biennial basis.	FWS
Activity VS-2.3: Based on the assessment above, seek funding, authority, or other needs to implement the recommendations for improvement.	FWS

3.5 Coordinating Conservation and Management Activities

3.5.1 Agency Coordination Action Plan

3.5.2 Constituency Building and Outreach Action Plan

3.5.3 Native Hawaiian Community Involvement Action Plan

3.5.4 Ocean Ecosystems Literacy Action Plan

3.5 Coordinating Conservation and Management Activities

Many government agencies and nongovernmental organizations work in close coordination with the MMB to achieve Monument goals. Implementation of action plans relies on resources and efforts from a variety of partners. The Co-Trustees and the MMB generally have a high level of involvement for most action plans, while other governmental agencies and nongovernmental organizations will contribute to action plans at varying levels. As Monument projects develop, more organizations will likely be involved. Section 2, Management Framework, and Section 3.5.1, the Agency Coordination Action Plan, provide discussions on the importance of collaboration and partnerships in effectively achieving Monument goals.

Participation by a broad sector of the public is also essential to any successful system of governance (Creighton 1981). The NWHI face an array of complex issues and competing interests. Public input into the decisionmaking process can help ensure that those interested are fairly represented and a strong base of support is built. Without a forum for participation and collaboration, disputes can linger and resources degrade (Pew 2003).

Working together, the MMB will adopt a three-part approach to coordinate management of the Monument. Each part is integral to the success of the whole: (1) agency coordination, which is essential to foster stewardship that takes ecosystem effects into account, (2) involvement of stakeholders, and (3) a strong program of education and outreach to build community support for ecosystem conservation.

Responsibility for management of the Monument is shared by the Co-Trustees. Stakeholders include Native Hawaiians, researchers, educators, conservation groups, fishers, and others. Collaborative management mechanisms are needed to facilitate effective interagency coordination for management and to provide opportunities for active stakeholder participation and input from community forums and various partnerships, and specifically from the Native Hawaiian community.

Action plans to facilitate collaboration and partnerships in the management of the NWHI focus on providing the operational framework to enhance interagency coordination and to provide broad stakeholder involvement in managing the NWHI. Each action plan consists of a set of strategies to address a desired outcome. The desired outcomes of these action plans are as follows:

- **Agency Coordination:** Successfully collaborate with government partners to achieve publicly supported, coordinated management in Papahānaumokuākea Marine National Monument.
- **Constituency Building and Outreach:** Cultivate an informed, involved constituency that supports and enhances conservation of the natural, cultural, and historic resources of the Papahānaumokuākea Marine National Monument
- **Native Hawaiian Community Involvement:** Engage the Native Hawaiian community in active and meaningful involvement in Papahānaumokuākea Marine National Monument management.

- **Ocean Ecosystems Literacy:** Cultivate an ocean ecosystems stewardship ethic, contribute to the nation's science and cultural literacy, and create a new generation of conservation leaders through formal environmental education.

Action plans described in this section will be implemented in close coordination with agency partners and in conjunction with other priority management needs.

3.5.1 Agency Coordination Action Plan

Desired Outcome

Successfully collaborate with government partners to achieve publicly supported, coordinated management in Papahānaumokuākea Marine National Monument.

Links to other Action Plans	
3.3.1	Permitting
3.3.2	Enforcement
3.5.3	Coordinated Field Operations

Current Status and Background

The NWHI has had a long history of multiagency coordination as a result of the divided responsibilities among several management agencies over the past 100 years (Shallenberger 1984). The Navy assumed jurisdiction over Midway Atoll in 1903. In 1909, President Theodore Roosevelt signed Executive Order 1019 to create the Hawaiian Islands Reservation, and management responsibility was given to the U.S. Department of Agriculture; the reservation was later renamed the Hawaiian Islands National Wildlife Refuge and managed under the authority of the FWS. On February 10, 1936, President Franklin Roosevelt set aside Kure Island to the U.S. Navy by Executive Order 7299. Sixteen years later, President Harry Truman “restored” “Kure (Ocean) Island, together with the surround reef, ... to the possession, use, and control of the Territory of Hawaii” (Executive Order 10413, November 17, 1952). The Hawaii Organic Act and the Hawaii Admission Act gave the Territory of Hawai‘i responsibility for nearshore waters of the NWHI, excluding Midway. In 1988, Midway Atoll was designated a National Wildlife Refuge. Under federal law, NOAA Fisheries is responsible for the management of monk seals, as well as for sea turtles when they are in marine waters; FWS is responsible for the management of sea turtles when they are on land. The State of Hawai‘i also has jurisdiction over these species under state wildlife and endangered species laws. NOAA’s National Ocean Service, through the National Marine Sanctuary Program, joined the jurisdictional players in December 2000, when Executive Order 13178 (as amended by 13196) created the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve (adapted from Shallenberger 2004).

Links to Goals
Goal 1
Goal 2
Goal 4

Several innovative programs involving federal, state, and private entities have resulted in cooperative efforts to protect and restore natural, cultural, and historic resources in the NWHI. Notable examples include the following:

- The creation of a State Marine Refuge in the NWHI in 2005.
- Several multiagency collaborative research efforts under the Northwestern Hawaiian Islands Reef Assessment and Monitoring Program, conducted since 2000.
- Collaborative educational partnerships, including Navigating Change, Hawai‘i’s Living Reef program, and outreach for the 2002 and 2004 Northwestern Hawaiian Islands Research and Monitoring Program efforts.
- A multiagency collaborative process to establish a regional research forum and to identify regional research and science priorities.
- The NWHI Third Scientific Symposium (2004).
- A regional collaboration that led to the identification of several maritime archaeology and history sites.
- A process to identify opportunities for collaborative permitting and enforcement efforts.
- Development of a unified permitting system for the Monument.

- Critically needed multiagency marine debris removal efforts, ongoing since 1996.
- Collaborative support of Hawaiian monk seal and green turtle recovery and field camps.

Coordination of Monument resource management is overseen by the Co-Trustee agencies, while day-to-day management is implemented by the MMB, as described in Section 2. However, several other federal agencies, including the U.S. Coast Guard, U.S. Geological Survey, EPA, and DOD and various state agencies have roles to play in the Monument, including helping to implement the various strategies and activities in the Monument Management Plan. They could be part of the larger Interagency Coordinating Committee (ICC). Coordination among all parties with regulatory and management responsibilities is crucial to successful Monument operations. The ICC is further described in Section 2.2.

Need for Action

The creation of the Papahānaumokuākea Marine National Monument in 2006 offers a unique opportunity to carry out coordinated management across multiple federal and state agencies to achieve strong, long-term protection of the NWHI. While management of the Monument is the responsibility of the three Co-Trustees, as described in Proclamation 8031, many important government partners also have missions that are affected by and may affect Monument management strategies. Collaboration with all government stakeholders is essential, which is why the MMB and the ICC were established. The unique biological, cultural, scientific, educational, historic, and recreational values of the NWHI require that the region be carefully managed to ensure these values are not diminished for future generations. This action plan presents strategies and activities for facilitating interagency coordination to successfully collaborate with government partners in the NWHI.

Strategies to Achieve the Desired Outcome

Agency coordination in the remote Monument ecosystems is essential to the lasting protection of ecosystems and resources. To achieve the desired outcome of publicly supported coordinated management, three strategies have been developed. The strategies and activities are coded by the acronym for the action plan title, “Agency Coordination” (AC). A summary of strategies and activities is provided in Table 3.5.1 at the end of this action plan.

- AC-1: Ensure effective communications and procedural operations of the MMB.
- AC- 2: Establish and support cooperative management agreements with agency partners.
- AC-3: Promote international, national, and local agency collaborations to increase capacity building and foster networks that will improve management effectiveness.

Strategy AC-1: Ensure effective communications and procedural operations of the MMB.

The MMB was established by the Co-Trustee MOA in 2006 (see Section 2, Management Framework). The MMB is charged with promoting coordinated management of the Monument at the field level and implementing day-to-day management activities necessary to achieve strong, long-term protection of the NWHI for current and future generations. Working across multiple agencies can present a challenge to management if clear and effective procedures are not established.

Activity AC-1.1: Establish standard operating procedures, as needed, to provide direction and improve communication within the MMB.

Standard operating procedures are often necessary to facilitate consistent implementation and ensure that processes are continued and completed on a prescribed schedule. They also serve as a historical record of steps taken and a basis for revising the steps when changes to the process are proposed. In order to ensure that unwritten knowledge and skills do not disappear when positions are filled with new staff, standard operating procedures for the MMB will be written and properly maintained. Standard operating procedures will be developed and included in the interagency MMB charter that will guide the operations of the MMB. These procedures will be reviewed on a regular basis and updated as necessary.

Strategy AC-2: Establish and support cooperative management agreements with agency partners.

The MOA signed in 2006 by the State of Hawai‘i, the DOI, and the DOC promotes coordinated management of the Monument and establishes the functional relationships to effectively coordinate on all management actions. This agreement serves as the foundation for entering into other agreements among the Co-Trustees and with agencies and other entities, as appropriate. Formal partnerships and agreements will be developed with essential agency partners who can help provide comprehensive protection for the ecosystems and resources of the NWHI. The MMB will explore the potential of developing new agreements, including the possibility of amending the 2006 MOA to increase Native Hawaiian involvement in the management of the Monument.

Activity AC-2.1: The MMB will explore the potential of developing new agreements, including the possibility of amending the 2006 MOA to increase Native Hawaiian involvement in the management of the Monument.

The Native Hawaiian voice is missing at the Co-Trustee level under the MOA signed in 2006 for the coordinated management of Papahānaumokuākea, which is precious and sacred to Native Hawaiians. The MMB will explore the potential of developing new agreements, including the possibility of amending the 2006 MOA to increase Native Hawaiian involvement in the management of the Monument. If it is determined that the 2006 MOA should be amended to include a Native Hawaiian governmental organization as a signatory party, the Office of Hawaiian Affairs could fill the position of the fourth Co-Trustee until a Native Hawaiian governing entity is re-established to assure that the cultural significance of Papahānaumokuākea is given as much importance as is noted in Presidential Proclamation 8031.

Activity AC-2.2: Establish agreements for coordinated management and conduct cooperative management operations.

Building on the MOA signed in 2006 and any subsequent amendments, new agreements will be developed among the MMB to support collaborations that facilitate coordinated management. Such agreements will specify roles, responsibilities, and periodic reviews. Opportunities for interagency collaboration may include personnel agreements and crosscutting budget initiatives to promote coordinated management and effective implementation of strategies identified in the action plans. The MMB will work together to establish priorities and initiate joint activities.

Activity AC-2.3: Develop interagency agreements, grants, and memoranda of agreement as needed to carry out specific program priorities.

Cooperative projects will be pursued with agencies outside of the MMB that allow for ease in sharing resources and in-kind assistance and support, as appropriate. Efforts will continue to coordinate with and support the ICC. Formal agreements required for specific program areas will be developed as needed. Collaborative agency efforts that may benefit from formal and other informal agreements are described in the following action plans: Alien Species (Section 3.3.2), Coordinated Field Operations (Section 3.6.3), Emergency Response and Natural Resource Damage Assessment (Section 3.3.4), Enforcement (Section 3.4.2), Threatened and Endangered Species (Section 3.2.1), Information Management (Section 3.6.2), Maritime Heritage (Section 3.1.4), Marine Debris (Section 3.3.1), Permitting (Section 3.4.1), and Habitat Management and Conservation (Section 3.2.3).

Activity AC-2.4: Convene Interagency Coordinating Committee meetings, including an annual workshop.

The ICC is an important venue for state and federal agencies to share information about the Monument's natural and cultural resources and their activities in and around the Monument. This venue also provides an opportunity to facilitate agency coordination and collaboration on implementing the various MMP strategies and activities. The MMB is committed to organizing and supporting periodic ICC meetings to improve coordination and information exchange and as necessary to discuss and resolve interagency issues. An annual interagency strategic planning workshop will be conducted with the ICC to discuss previous year activities and align planned activities and priorities. Gaps and additional needs will be identified along with strategies to address them. (See the Evaluation Action Plan, Section 3.6.4)

Strategy AC-3: Promote international, national, and local agency collaborations to increase capacity building and foster networks that will improve management effectiveness.

Collaborations at the international, national, and local levels are needed to promote information sharing, relationship building, and adaptive use of management tools for conservation and resource management. These partnerships can provide a regional and global context to better understand the significance of traditional knowledge in resource management, the need for scientific and cultural research, and the development of management models that could be applied to the Pacific and beyond.

Activity AC-3.1: Enhance communication and cooperation with the U.S. Department of Defense and the U.S. Navy Pacific Fleet.

Through the ICC and other forums, the MMB will maintain open communication with the DOD and the Navy on potential areas of cooperation, including enforcement; minimizing adverse impacts on Monument resources and qualities; support of zoning, permitting, and tracking programs; and regional and local restoration and wildlife protection efforts.

Activity AC-3.2: Network with other marine protected areas in the Pacific.

The MMB will foster and promote relationships with the marine protected area managers and constituents in Hawai'i and the Pacific that face impacts of climate change, enforcement,

surveillance, and other challenges common to coral reef ecosystem management. Through such regional collaboration, participating organizations could share information on subjects such as coordinated management plan development, mitigation and response strategies to deal with climate change, enforcement, incorporating traditional knowledge, research, and outreach about the importance of coral reef ecosystems to the world. Networking with other marine protected areas in the Pacific is essential for promoting collaborations and to establish the role of the Pacific in the overall global context of marine conservation. Efforts will also be made to promote exchanges within the Pacific Region to an international audience.

Activity AC-3.3: Support the bid for World Heritage Site status.

In 2007, the Monument was included on the new U.S. World Heritage Tentative List as a site within the United States for outstanding universal value for both its natural and cultural heritage. The U.S. Tentative List was submitted to the UNESCO World Heritage Center for consideration in February 2008. The MMB will continue to support the bid for World Heritage designation across agencies to ensure a high level of communication and coordination.

Table 3.5.1 Summary of Strategies, Activities, and Agency Leads for Agency Coordination

Strategies and Activities	Agency Lead
Strategy AC-1: Ensure effective communications and procedural operations of the MMB.	
Activity AC-1.1: Establish standard operating procedures, as needed, to provide direction and improve communication within the MMB.	NOAA
Strategy AC-2: Establish and support cooperative management agreements with agency partners.	
Activity AC-2.1: Explore the potential of developing new agreements, including the possibility of amending the 2006 MOA to increase Native Hawaiian involvement in the management of the Monument.	OHA
Activity AC-2.2: Establish agreements for coordinated management and conduct cooperative management operations.	NOAA
Activity AC-2.3: Develop interagency agreements, grants, and memoranda of agreement as needed to carry out specific program priorities.	NOAA
Activity AC-2.4: Convene Interagency Coordinating Committee meetings, including an annual workshop.	NOAA
Strategy AC-3: Promote international, national, and local agency collaborations to increase capacity building and foster networks that will improve management effectiveness.	
Activity AC-3.1: Enhance communication and cooperation with the U.S. Department of Defense and the U.S. Navy Pacific Fleet.	State of Hawaii
Activity AC-3.2: Network with other marine protected areas in the Pacific.	State of Hawai'i
Activity AC-3.3: Support the bid for World Heritage Site status.	State of Hawai'i

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3.5.2 Constituency Building and Outreach Action Plan

Desired Outcome

Cultivate an informed, involved constituency that supports and enhances conservation of the natural, cultural, and historic resources of Papahānaumokuākea Marine National Monument.

Links to other Action Plans
All Action Plans

Current Status and Background

The MMB currently conducts diverse constituency building and outreach activities related to the Monument, such as:

Links to Goals
Goal 4 Goal 5 Goal 6 Goal 8

- Operating discovery centers and visitor facilities, including Mokupāpapa Discovery Center in Hilo and the Midway Atoll visitor center;
- Developing and disseminating informational materials such as fact sheets, brochures, planning updates, and reports;
- Updating and maintaining Monument websites;
- Conducting informational meetings, workshops, and seminars to inform constituencies and seek input on various aspects of Monument management;
- Issuing news releases, feature stories, and public service announcements;
- Working with partners in community fairs, photography exhibits, and documentaries;
- Partnering with support groups such as the Friends of Midway Atoll NWR and the National Marine Sanctuary Foundation;
- Involving volunteers in management and support activities;
- Seeking public review of Monument permit applications for activities proposed in State waters at the State Board of Land and Natural Resources; and
- Seeking public review of draft plans and environmental analyses through NEPA requirements.

The Monument’s diverse constituencies in Hawai‘i and beyond include federal and state agencies with responsibilities for the region; industry and community stakeholders; and prospective and permitted users. Key Monument constituencies that have been identified to date include, but are not limited to, the following:

- Government agencies with responsibilities in the NWHI
- Native Hawaiian community
- Conservation groups
- Research/academia
- Commercial and recreational fishers
- Local community experts
- Schools, organizations, and institutions that conduct marine education and outreach programs throughout Hawai‘i
- Other states, territories, and Pacific nations managing coral reefs
- Business/industry
- Elected officials
- General public at large

Outreach to these diverse communities must be coordinated closely with the strategies and activities identified in the individual action plans detailed in this management plan. A vigorous public outreach and education effort that bridges community concerns and needs with measures applied to protect the resources of the Monument will galvanize broader support for ocean and island conservation and the MMB’s work. Such support will bolster the MMB’s ability to effectively protect NWHI marine resources.

A strong, sustained constituency-building effort is particularly important in the Monument’s early formative years to establish its role in the region and in local, national, and global resource management circles and to set a proactive course into the future.

Need for Action

Stakeholder and community involvement is an integral component to creating an informed and engaged constituency that would further the successful protection of the ecosystems and resources of the NWHI, thus achieving the goals of the Monument (see Section 2, Management Framework). Active and meaningful engagement between management and local experts is considered integral to resilient and adaptive approaches (Berkes 2003; Leslie & Mcleod 2007).

A study conducted by Ward Research in March 2006 for the National Marine Sanctuary Foundation found that the majority of residents of the State of Hawai‘i were unaware of the NWHI and its protected status. More than 50 percent of Hawai‘i’s residents believed that there are only eight Hawaiian Islands (Ward Research 2006). For the question, “How many islands, atolls, and other land masses make up what we know as the Hawaiian Islands?,” the proportion of residents who answered the correct, “more than 15” or “plenty/too many to count” decreased from the previous year (22 percent, compared with 28 percent in 2005).

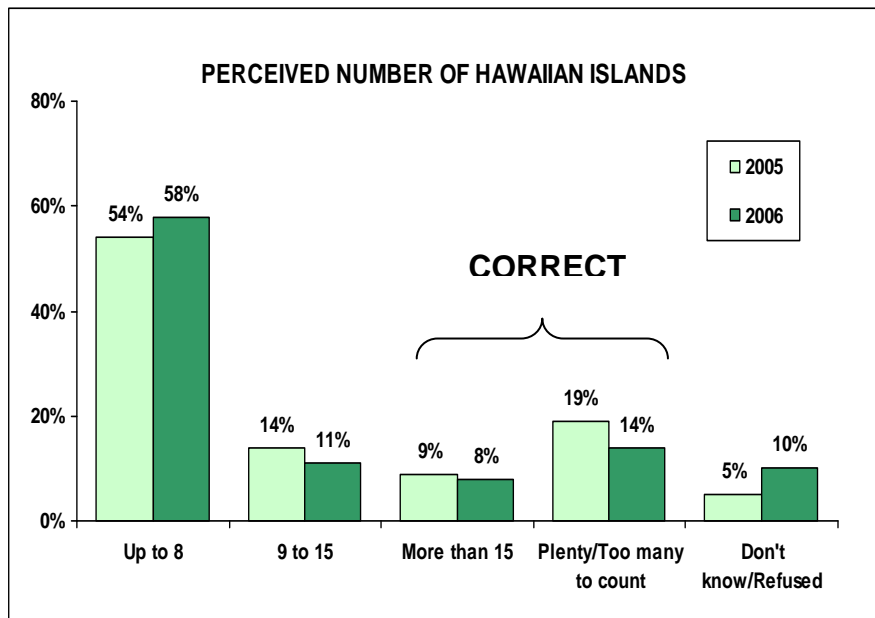


Figure 3.1 Perceived Number of Hawaiian Islands

The establishment of the Monument provides opportunities for the managing agencies to collaborate and share resources for effective constituency building and outreach activities. Currently, the agencies often implement public outreach activities separately, use a similar and limited range of strategies and activities, and target similar constituencies. As the Monument constituencies comprise a wide range of user groups and individuals, various methods will be

needed to best engage them in Monument management. A range of strategies and activities are needed to develop, engage, and sustain the active involvement and support of constituencies in Hawai‘i as well as national and international publics. These strategies and activities will keep the public informed as well as provide opportunities for input on management decisionmaking from various stakeholder groups. This action plan presents strategies and activities to develop an integrated constituency-building framework supported by collaborative activities of the Co-Trustees.

Strategies to Achieve the Desired Outcome

The following strategies have been identified to achieve the desired outcome of cultivating an informed, involved constituency that supports and enhances conservation of the natural, cultural, and historic resources of the Monument. These strategies provide both capacity building, which will ensure continuity and effectiveness of Monument communication efforts, and public interface, which will allow for various levels of support for and participation in activities related to the Monument. The strategies and activities are coded by the acronym for the action plan title, “Constituency Building and Outreach” (CBO). A summary of strategies and activities is provided in Table 3.5.2 at the end of this action plan.

- CBO- 1: Develop and implement an integrated communications strategy, based on an assessment of ongoing activities and future needs, to coordinate outreach and engage Monument constituencies within 5 years.
- CBO-2: Continue to develop and disseminate materials and improve and update tools that help inform Monument constituencies about the Monument over the life of the plan.
- CBO-3: Continue initiatives that allow Monument constituencies to be more involved in the Monument and enhance opportunities for long-term engagement over the life of the plan.
- CBO-4: Develop and implement an overarching Monument interpretive strategy, including site-specific planning documents for the Monument’s visitor facilities, within 5 years.

Strategy CBO-1: Develop and implement an integrated communications strategy, based on an assessment of ongoing activities and future needs, to coordinate outreach and engage Monument constituencies within 5 years.

The integrated communications strategy will be made up of various components, including visitor site administration, capacity building, research and development, telecommunication tools, and assessment. The following activities will help to achieve the initiatives of these components and ensure the effectiveness of the integrated strategy.

Activity CBO-1.1: Develop an integrated communications strategy based on an assessment of ongoing activities and future needs.

A unified strategy for constituency building and outreach for the Monument will be developed. The integrated strategy will include a description of the different types of constituencies that need to be informed, engaged, and sustained in support of the Monument; specific strategies, messages, and activities related to each constituency; and indicators to evaluate effectiveness. In developing the document, the MMB will engage analogous entities, such as administrating agencies of

Australia's Great Barrier Reef, to learn lessons from their constituency building and outreach successes. Existing constituency building activities of all MMB agencies generally will be continued under the new Monument framework. This will ensure continued support for already successful programs and the development of new activities that enhance existing support for the region. The Monument communications strategy will be reviewed and updated every 3 years, at a minimum.

Activity CBO-1.2: Continue to refine and implement the Monument Media Communications Protocol to engage news media in informing the public about the Monument's resources and activities.

A key aspect of the communications strategy is media protocol. In February 2007, a Monument media communications protocol was developed to ensure the media receive accurate, consistent, and timely information about the Monument; its natural, cultural, and historic resources; and ongoing activities related to the Monument. An interagency communications team implements the strategy, ensuring that all of the managers are included in the review process and presenting a unified position to the public. Contacts, standards, and procedures are clearly identified within the protocol. Unlike the communications strategy overall, the protocol will be reviewed any time the need arises from any agency or is deemed necessary because of unforeseen external circumstances.

Activity CBO-1.3: Develop a consistent Monument identity to be used in all communications strategies that reflects its comanagement within 1 year.

The Co-Trustees currently maintain their three separate identities and include all agency logos on most communications materials. The MMB will develop a new Monument "corporate identity," reflecting its shared management on behalf of the American people.

Activity CBO-1.4: Incorporate new perspectives for understanding the value of NWHI ecosystems, including socioeconomic studies, to increase ocean ecosystems literacy and conservation in the Monument within 5 years.

The Monument will serve as a powerful focal point for understanding climate change and increasing ocean ecosystems literacy. To engage a broad and diverse base of constituents and local experts, Monument staff must continuously expand the types of products, messages, and modes of communication used in education and outreach programs. The MMB will support and seek out traditional and local knowledge as well as new perspectives that contribute different ways of valuing the ecosystems of the NWHI. New and innovative ways to look at the value of marine ecosystems, such as socioeconomic analysis of the nonmarket value of coral reefs, will also be supported.

Activity CBO-1.5: Research and implement new technologies and tools to increase public understanding of the NWHI ecosystems within 5 years.

Telepresence (technologies that allow a person to feel as if they were present, to give the appearance that they were present, or to have an effect at a location other than their true location) is an important tool for helping to educate the larger community about the special region of the Monument. Since most people will not be able to visit the Monument because of its remoteness and fragility, it is important to bring the place to the people. Telepresence technologies such as underwater video cameras, real-time video transmission, virtual field trips, website interfaces,

and exhibits in discovery centers that present this content will play an important role in educating the public about the NWHI. Obstacles to implementing these technologies do exist, such as cost, feasibility, and ecological sensitivities, but the Monument will continue to invest in and utilize new technologies for providing this virtual experience.

Strategy CBO-2: Continue to develop and disseminate materials and improve and update tools that help inform Monument constituencies about the Monument over the life of the plan.

Providing information about the Monument through products such as websites, brochures, and other media is one of the first steps toward raising the overall awareness of the Monument with the public (local, national, and international). The MMB will also seek to provide versions of materials in ‘ōlelo Hawai‘i when appropriate and possible.

Activity CBO-2.1: Establish a new Monument website that will allow constituents to visit a single site for all Monument-related information within 1 year.

Currently, the three Co-Trustee agencies all maintain separate websites that provide information about the Monument. The MMB is developing a single interagency website (<http://www.papahānaumokuākea.gov>) that will be jointly managed and regularly updated with information about permit and management activities, planning updates, and other information.

Activity CBO-2.2: Continue to develop and update printed materials to aid Monument constituencies in understanding key aspects of the Monument.

Although an overall site brochure is the primary informational mechanism to help the public understand the Monument, additional materials will be developed to aid in the understanding of more specific aspects of the entire region and on the ways in which the public can participate. Topics to be addressed will include, but will not be limited to, Native Hawaiian culture; research; management activities; permitting; Monument wildlife, historic, and cultural resources; impacts associated with climate change; and volunteer activities. These materials will be printed pieces, such as the update letter that was provided to the public during the development of the Monument Management Plan, but may also include multimedia components or be developed as a suite of materials.

Activity CBO-2.3: Support other entities' efforts to broaden knowledge of and appreciation for Monument resources and management priorities.

Establishment of the Monument has created interest from documentary filmmakers, writers, photographers, and other entities to help us “bring the place to the people.” The MMB will support those endeavors that provide benefit to Monument resources and management and our constituents without impacting Monument resources.

Strategy CBO-3: Continue initiatives that allow Monument constituencies to be more involved in the Monument and enhance opportunities for long-term engagement over the life of the plan.

This strategy will continue efforts to create an interactive experience with constituents by providing the support and activities necessary to develop a long-term commitment to the

Monument from a growing number of increasingly knowledgeable constituents. This strategy will also explore means by which local experts can be actively and meaningfully involved in the management of the Monument. The Monument is a vast region that will need a strong network of constituents who are connected to the NWHI in order to ensure that the plans initiated today are carried out and implemented successfully over time. However, this kind of success is realized only when the support is rooted in an engaged community and when the relationship between the agency and its constituents has matured into one of collaboration.

Activity CBO-3.1: Continue to seek out and participate in events that reach a broader audience and provide constituents with knowledge of the Monument.

The MMB agencies individually have a history of participating in various public outreach activities. We will collaborate to enhance existing participation and find new venues. Examples of such activities include, but are not limited to, events such as fairs, lecture series, and public forums.

Activity CBO-3.2: As needed, hold focused forums on various Monument-related issues or topics to inform and engage a broader range of constituents.

The MMB will offer public forums on specific topics or issues both to exchange information with our constituencies and to build awareness and support. These forums will be offered at various locations to facilitate participation by a broad range of constituents.

Activity CBO-3.3: Continue to seek out and support partnership opportunities that focus on Oceania-related issues.

As the Hawaiian Archipelago is most closely related to other sites across Oceania, it is important for the Monument to collaborate with a network of marine managed areas in this region. These partnerships will allow for a greater exchange of knowledge and expertise. They will also provide opportunities to build awareness about the important connection between cultural and conservation practices.

Activity CBO-3.4: Continue to build and nurture volunteer programs that develop knowledge of, involvement in, and support for Monument programs and resources.

Volunteers offer an opportunity to build a new base of constituents who are closely connected to and involved in efforts of the Monument. Volunteers are essential in carrying out our mission to protect this valuable resource. We will work to enhance existing efforts and to build capacity to support these important efforts.

Long-term volunteers help with outreach and education needs, especially at Mokupāpapa Discovery Center and Midway Atoll, and with habitat restoration and wildlife monitoring, especially at Tern Island, Laysan Island, Midway Atoll, and Kure Atoll. In addition, we will incorporate Midway Atoll visitors into volunteer programs for habitat restoration, wildlife population monitoring, and historic restoration projects, as outlined in the Midway Atoll Visitor Services Plan. Overnight visitors will be encouraged to participate in volunteer activities, including eradication of invasive plants, collection of marine debris, and restoration of native plants and historic structures. Many visitors want to “give something back” to the environment during their time on the atoll, and these activities will help restore acres of habitat.

Activity CBO-3.5: Establish and support a Papahānaumokuākea Marine National Monument Alliance to engage a broad range of constituents, who will provide recommendations and information on specific management issues on a regular basis.

The Co-Trustees are committed to establish a Monument Alliance within 1 year, composed of individuals who represent communities and stakeholders interested in the Monument's stewardship. The Alliance will provide individual advice and recommendations to the Monument management agencies regarding management of Monument resources over which the Co-Trustees have responsibilities. It will serve as a community-based forum to exchange information; provide community input and individual recommendations on Monument policies, activities, and management; advocate for Monument conservation; and enhance broader community and public understanding. Within 2 years after the release of the Monument Management Plan, the Co-Trustees will charter the Alliance as an advisory committee under the Federal Advisory Committee Act (FACA), or as a FACA-exempt advisory body to allow the Alliance to provide consensus advice to the Co-Trustees, per the amended Memorandum of Agreement. Meetings of the Monument Alliance will be convened on a regular basis, with specific topics identified for each meeting. The meetings will be well publicized and open to the public, and will be held at various locations to facilitate

Activity CBO-3.6: Continue to support the Native Hawaiian Cultural Working Group through the Office of Hawaiian Affairs.

This group is made up of members of the Native Hawaiian community who provide guidance to the State of Hawai'i through the Office of Hawaiian Affairs. This group has offered support on permit review and cultural protocols, and provided the Monument with its name. By better incorporating Hawaiian culture into Monument management, we gain long-term support and greater understanding from the community that represents the host culture of the entire Hawaiian Archipelago.

Activity CBO-3.7: Continue working with the Friends of Midway Atoll National Wildlife Refuge through FWS and support the establishment of a Monument-related "friends" group.

The Friends of Midway Atoll NWR is a nonprofit group that was formed in 1999 and currently has more than 200 members from across the nation who contribute to the interpretation, recreation, and educational programs of the Refuge. In addition to continuing to work with the Friends of Midway Atoll NWR, we will work with other Monument-wide "friends" groups if established.

Activity CBO-3.8: Continue to convene the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve Advisory Council through NOAA's Office of National Marine Sanctuaries until the Monument Alliance is established.

The Reserve Advisory Council (RAC) was formed in 2001 and has served as a mechanism for public input and a venue for public comment on management activities. The composition of the Reserve Advisory Council is designed to provide formal advice to the ONMS from a variety of stakeholder viewpoints and geographic representation. Continuing the RAC would provide a public forum for members of the community and constituencies to allow for input on the Reserve until such a mechanism is established for the Monument.

Strategy CBO- 4: Develop and implement an overarching Monument interpretive strategy, including site-specific planning documents for the Monument’s visitor facilities, within 5 years.

As one of many means of communication, several facilities that interpret Monument resources and activities have been developed, most of them prior to designation of the Monument. This strategy includes the development of an interpretive plan, as well as evaluation strategies and maintenance schedules. By unifying all Monument interpretation under a single strategy, the MMB can ensure targeted, appropriate messages are delivered to our constituents in a consistent manner that leads to achievement of Monument goals.

Activity CBO-4.1: Develop interagency Monument interpretive themes to guide all interpretive products and activities.

Although initial discussions of Monument-wide interpretive themes have been held among the Co-Trustee agencies, a more focused study is needed. These interpretive themes will guide the development and presentation of interpretive sites and products, linking tangible resources to intangible meanings, creating emotional and intellectual connections to the meanings of the resource, and making the Monument personally relevant to individuals.

Activity CBO-4.2: Review existing interpretive sites and activities to determine their current relevance to the Monument and how they could better represent Monument themes.

Two existing interpretive facilities—Mokupāpapa: Discovery Center for Hawai‘i’s Remote Coral Reefs in Hilo, Hawai‘i, and the Midway Atoll NWR visitor center on Sand Island, Midway Atoll—and the proposed visitor facility at NOAA’s Pacific Regional Center on Ford Island, O‘ahu, will be reviewed and updated so that they better reflect the Monument’s cultural, natural and historic resources as a whole.

Activity CBO-4.3: Develop a Monument interpretive plan to guide future interpretive projects and activities.

The overarching Monument interpretive strategy will identify the Monument’s interpretive themes, audiences, messages, and media, and include information on project priorities, costs, staffing needs, and schedules.

Activity CBO-4.4: Seek additional opportunities to expand Monument interpretive efforts to new sites and through new technologies, creating a network of coordinated interpretive sites.

The MMB will identify new sites and technologies to better reach our audiences. In many cases, we will work with private or other government entities to include Monument messages in broader arenas. Possible partnership opportunities exist in aquaria, schools and universities, parks, government buildings, hotels, and many other locations.

Activity CBO-4.5: Working with the National Park Service, U.S. Navy, and other key entities, develop off-site exhibits on the Battle of Midway and the associated National Memorial to be integrated into World War II memorial sites of the Pearl Harbor Historic District.

In establishing the Battle of Midway National Memorial at Midway Atoll, FWS was charged with ensuring that the heroic courage and sacrifice of those involved in the battle will never be forgotten. Although this interpretive theme will be important at Midway Atoll, a relatively small

number of visitors will be reached. A much broader audience will be found within the Pearl Harbor Historic District, where the USS Arizona Memorial, USS Missouri, USS Bowfin, and sites on Ford Island receive at least 1.5 million visitors each year. The MMB, working with partner agencies and other key entities, will develop exhibits about the Monument that can be integrated with other existing interpretative facilities and sites.

Table 3.5.2 Summary of Strategies, Activities, and Agency Leads for Constituency Building and Outreach

Strategies and Activities	Agency Lead
Strategy CBO-1: Develop and implement an integrated communications strategy, based on an assessment of ongoing activities and future needs, to coordinate outreach and engage Monument constituencies within 5 years.	
Activity CBO-1.1: Develop an integrated communications strategy based on an assessment of ongoing activities and future needs.	FWS
Activity CBO-1.2: Continue to refine and implement the Monument Media Communications Protocol to engage news media in informing the public about the Monument’s resources and activities.	FWS
Activity CBO-1.3: Develop a consistent Monument identity to be used in all communications strategies that reflects its comanagement within 1 year.	NOAA
Activity CBO-1.4: Incorporate new perspectives for understanding the value of NWHI ecosystems, including socioeconomic studies, to increase ocean ecosystems literacy and conservation in the Monument within 5 years.	NOAA
Activity CBO-1.5: Research and implement new technologies and tools to increase public understanding of the NWHI ecosystems within 5 years.	NOAA
Strategy CBO-2: Continue to develop and disseminate materials and improve and update tools that help inform Monument constituencies about the Monument over the life of the plan.	
Activity CBO-2.1: Establish a new Monument website that will allow constituents to visit a single site for all Monument-related information within 1 year.	NOAA
Activity CBO-2.2: Continue to develop and update printed materials to aid Monument constituencies in understanding key aspects of the Monument.	NOAA
Activity CBO-2.3: Support other entities’ efforts to broaden knowledge of and appreciation for Monument resources and management priorities.	FWS
Strategy CBO-3: Continue initiatives that allow Monument constituencies to be more involved in the Monument and enhance opportunities for long-term engagement over the life of the plan.	
Activity CBO-3.1: Continue to seek out and participate in events that reach a broader audience and provide constituents with knowledge of the Monument.	NOAA
Activity CBO-3.2: As needed, hold focused forums on various Monument-related issues or topics to inform and engage a broader range of constituents.	State of Hawai‘i

Strategies and Activities	Agency Lead
Activity CBO-3.3: Continue to seek out and support partnership opportunities that focus on Oceania-related issues.	NOAA
Activity CBO-3.4: Continue to build and nurture volunteer programs that develop knowledge of, involvement in, and support for Monument programs and resources.	FWS
Activity CBO-3.5: Establish and support a Papahānaumokuākea Marine National Monument Alliance to engage a broad range of constituents, who will provide recommendations and information on specific management issues on a regular basis.	NOAA
Activity CBO-3.6: Continue to support the Native Hawaiian Cultural Working Group through the Office of Hawaiian Affairs.	OHA
Activity CBO-3.7: Continue working with the Friends of Midway Atoll National Wildlife Refuge through FWS and support the establishment of a Monument-related “friends” group.	FWS
Activity CBO-3.8: Continue to convene the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve Advisory Council through NOAA’s Office of National Marine Sanctuaries until the Monument Alliance is established.	NOAA
Strategy CBO-4: Develop and implement an overarching Monument interpretive strategy, including site-specific planning documents for the Monument’s visitor facilities, within 5 years.	
Activity CBO-4.1: Develop interagency Monument interpretive themes to guide all interpretive products and activities.	NOAA
Activity CBO-4.2: Review existing interpretive sites and activities to determine their current relevance to the Monument and how they could better represent Monument themes.	FWS
Activity CBO-4.3: Develop a Monument interpretive plan to guide future interpretive projects and activities.	FWS
Activity CBO-4.4: Seek additional opportunities to expand Monument interpretive efforts to new sites and through new technologies, creating a network of coordinated interpretive sites.	NOAA
Activity CBO-4.5: Working with the National Park Service, U.S. Navy, and other key entities, develop off-site exhibits on the Battle of Midway and the associated National Memorial to be integrated into World War II memorial sites of the Pearl Harbor Historic District.	FWS

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3.5.3 Native Hawaiian Community Involvement Action Plan

Desired Outcome

Engage the Native Hawaiian community in active and meaningful involvement in Papahānaumokuākea Marine National Monument management.

Links to other Action Plans	
3.1.2	Native Hawaiian Culture and History
3.5.1	Agency Coordination
3.5.2	Constituency Building and Outreach

Current Status and Background

The Executive Order that designated the NWHI Coral Reef Ecosystem Reserve (Reserve) in 2000 required that Native Hawaiians, among others, provide advice regarding management of the Reserve and ensuring the continuance of Native Hawaiian practices. It did so through provisions allowing for “culturally significant, noncommercial subsistence, cultural, and religious uses” in the Reserve by Native Hawaiians, and set aside three voting seats on the Reserve Advisory Council for Native Hawaiians. During its first five years of operation, the RAC established a Native Hawaiian Cultural Working Group, which broadened the inclusion of Native Hawaiians in the operations of the Reserve and in planning for a proposed National Marine Sanctuary.

Links to Goals
Goal 2
Goal 3
Goal 4
Goal 5
Goal 6
Goal 7

In addition to Native Hawaiian representation on the RAC and the establishment of a Native Hawaiian Cultural Working Group, the Reserve began efforts to consult with the Native Hawaiian community through a grant to the University of Hawai‘i’s Kamakakūokalani Center for Hawaiian Studies. This grant provided an opportunity for Native Hawaiians to develop the content of NOAA’s report on the cultural history of the NWHI from an indigenous point of view. The grant also convened key Native Hawaiian community members for a two-day planning session to make recommendations about future research, educational, and cultural activities that should be made available to Native Hawaiians and others to ensure a strong cultural link in the planning and management of the Reserve and throughout the sanctuary designation process.

These efforts provided a foundation for Native Hawaiian involvement in the Reserve, and this foundation has continued and expanded in the management of the Monument. Many Native Hawaiians remain unaware of efforts under way to protect the NWHI through management of the Monument. Although several prominent members of the Native Hawaiian community have been involved in the management and implementation of the Reserve, many others should be engaged, in part by working more closely with Native Hawaiian institutions.



Participants of the 2004 NWHI workshop on Native Hawaiian issues and concerns held at Kamakakūokalani Center for Hawaiian Studies at U.H. Mānoa. Photo: Dr. Kekuni Blaisdell

The Reserve set a standard for recognition and inclusion of Native Hawaiians in determining the future management of the NWHI. Strategies will be developed to involve the Native Hawaiian

community in the management of the Monument not only because of strong public support, but also because of the mandates of the Office of National Marine Sanctuaries to protect biological and cultural resources in the areas it manages, of the FWS to preserve historic sites as well as conserve and promote wildlife and their habitat, and of the State to protect ceded lands and the rights of Native Hawaiians.

An increasing number of resource management and conservation partnerships are being formed between indigenous groups and governmental bodies worldwide. In Hawai‘i, the Kaho‘olawe Island Reserve Commission and Mo‘omomi, Moloka‘i partnerships are examples of how traditional knowledge and values are integrated into resource management. An international example is seen in New Zealand, where Maori involvement in government conservation management projects ranges from consultation to full control over marine and terrestrial tribal regions.

The Native Hawaiian community has expressed a strong interest in participating in management decisions affecting the Reserve and Monument. Respecting Native Hawaiian traditions and values and providing an effective degree of participation in the protection and stewardship of the Monument will provide an opportunity for Native Hawaiians to maintain ancestral connections to the NWHI. Such connections will continue to further ongoing reconciliation efforts between Native Hawaiians and the United States.

Efforts are needed to directly engage Native Hawaiian concepts and participation in resource management, including perspectives in managing natural, cultural, and historic resources. The resulting synthesis of western and Hawaiian management concepts and practices is a significant step toward improving relationships and communication regarding Monument management. The MMB is committed to working with the Native Hawaiian community to identify specific and meaningful ways of engagement in managing the Monument. A variety of strategies to promote this engagement have been identified in this action plan as well as those in Section 3.1.2, the Native Hawaiian Culture and History Action Plan.

Need for Action

Numerous public comments collected during the scoping process for the proposed National Marine Sanctuary identified the need to include Native Hawaiians and Native Hawaiian traditional resource management practices in the management of the NWHI. Communities also expressed concern that Native Hawaiians must have access to continue cultural practices in the region. The comments indicated the need for direct consultation with Native Hawaiians, or more consultation over and beyond the representation of Native Hawaiians currently included in the management of the Monument.

The inclusion of terrestrial areas (particularly Nihoa, Mokumanamana, and Kure Atoll) and waters in the Monument creates a greater urgency to include Native Hawaiian perspectives in the Monument’s management. All of the documented Native Hawaiian archaeological sites in the NWHI are on Nihoa and Mokumanamana; they hold some of the densest scatters or concentrations of prehistoric structural sites in Hawai‘i; and they represent a pure example of the culture prevailing in Hawai‘i before the 13th century.

The Constitution of the State of Hawai‘i requires the State to care for Hawai‘i’s public trust resources and recognizes the state’s obligation to work for the cultural rights of Native Hawaiians. Given the unique history and constitutional and statutory requirements of the State to protect the claims and rights of Native Hawaiians in their homeland, the Native Hawaiian community must be involved in the planning, management, and operations of the Monument.

Strategies to Achieve the Desired Outcome

Three strategies have been identified for achieving the desired outcome of engaging the Native Hawaiian community in active and meaningful involvement in Monument management. The strategies and activities are coded by the acronym for the action plan title, “Native Hawaiian Community Involvement” (NHCI). A summary of strategies and activities is provided in Table 3.5.3 at the end of this action plan.

- NHCI-1: Regularly involve the Native Hawaiian community for the life of the plan.
- NHCI-2: Develop and annually maintain partnerships with Native Hawaiian organizations and institutions.
- NHCI-3: Identify and integrate Native Hawaiian traditional knowledge and management concepts into Monument management annually for the life of the plan.

Strategy NHCI-1: Regularly involve the Native Hawaiian community for the life of the plan.

The MMB includes representation by the Office of Hawaiian Affairs (OHA). Currently, OHA is the only State agency with a statutory mandate to advocate for Native Hawaiians and to assess the policies and practices of other agencies’ impacts on Native Hawaiians. OHA, on behalf of the MMB, will continue to convene the Native Hawaiian Cultural Working Group to obtain advice and guidance from Native Hawaiian cultural experts, including kūpuna (respected elders) and practitioners, on all Monument actions affecting Native Hawaiians and cultural resources in the Monument. Over time, the MMB may develop other mechanisms to bring together Native Hawaiians to participate in Monument activities and management.

Activity NHCI-1.1: Formalize, expand, and convene the Native Hawaiian Cultural Working Group.

During year 1, the MMB, through OHA, will formally establish a cultural working group, expanding the previously established working group, to ensure a strong cultural link in the planning and management of the Monument. Like its predecessor, this body would consist of kūpuna, cultural practitioners, Native Hawaiian resource managers, and others (see Section 3.5.2, the Constituency Building and Outreach Action Plan).

Activity NHCI-1.2: Engage the Native Hawaiian Cultural Working Group in the development of a Monument Cultural Resources Program.

The MMB will work with the Native Hawaiian Cultural Working Group and other Native Hawaiian organizations and institutions to develop a Monument Cultural Resources Program and corresponding cultural resource management activities. (See Section 3.1.2, the Native Hawaiian Culture and History Action Plan.)

Activity NHCI-1.3: Establish an annual cultural resources exchange.

The MMB will annually convene groups of Native Hawaiians who have visited the Monument to provide a safe venue to discuss the knowledge, experiences, and new questions gained during the past research season. The MMB will also update the Native Hawaiian community on its lessons learned from the last research season, including synopses of nonproprietary cultural reflections provided in various permittees' final reports. These exchanges may also include previous and on-going research, as well as status of curated cultural resources. These exchanges will not only update the Native Hawaiian community, but will also engage that community in determining the priorities and proposed methodologies of forthcoming research queries, theories, and needs. (See Section 3.1.2, the Native Hawaiian Culture and History Action Plan.)

Strategy NHCI-2: Develop and annually maintain partnerships with Native Hawaiian organizations and institutions.

Memoranda of Understanding, grant programs, and cooperative agreements have been useful in developing working relationships with partner agencies and organizations. Partnerships with Native Hawaiian organizations could similarly help to strengthen that community's involvement in Monument management and the development and implementation of programs involving Native Hawaiians. Partnering will help the Monument to consult with the broader Native Hawaiian community and aid in gathering information about cultural resources and practices.

Activity NHCI-2.1: Continue to expand and explore opportunities to partner with institutions serving Native Hawaiians.

In 2003, the Reserve established a partnership with the Kamakakūokalani Center for Hawaiian Studies and the University of Hawai'i to conduct cultural research, consult with the Native Hawaiian community, and produce educational materials related to the NWHI. The MMB will seek other opportunities to formally consult with and engage other Native Hawaiian groups and will develop outreach programs for the Native Hawaiian community. (Interagency partnerships are also addressed in Section 3.5.1, the Agency Coordination Action Plan.) Additional partnerships, contracts, grants, or formal agreements with Native Hawaiian organizations will be considered and established as opportunities arise.

Strategy NHCI-3: Identify and integrate Native Hawaiian traditional knowledge and management concepts into Monument management annually for the life of the plan.

Traditional resource management involves recognizing local variations, observing patterns, periodically applying kapu (restrictions on resource extraction and other activities) by konohiki (local managers), and maintaining a deep respect for, and intimate knowledge of, the environment. Integrating traditional knowledge will not only strengthen the relationship between Monument managers and the Native Hawaiian community, but will also provide additional tools and methods for improving management practices. This relationship will also perpetuate the application of traditional knowledge across the Hawaiian Archipelago.

Activity NHCI-3.1: Engage the Native Hawaiian community to identify how traditional knowledge will be integrated into Monument activities.

The Monument's cultural resources staff, to be developed pursuant to the Native Hawaiian Culture and History Action Plan (Section 3.1.2), will work with the Native Hawaiian community

and cultural experts to preserve and recover the knowledge of traditional Hawaiian resource management strategies and to identify how traditional knowledge and associated practices may be woven into Monument management and research activities. This activity will include developing recommendations for integrating these skills and knowledge into Monument management, and preparing a report of the recommendations within 2 years.

Activity NHCI-3.2: Use and integrate Native Hawaiian traditional knowledge in Monument management activities.

Based on recommendations developed under Activity NHCI-3.1, the MMB will integrate traditional perspectives, knowledge, and approaches in the management of Monument resources.

Table 3.5.3 Summary of Strategies, Activities, and Agency Leads for Native Hawaiian Community Involvement

Strategies and Activities	Agency Lead
Strategy NHCI-1: Regularly involve the Native Hawaiian community for the life of the plan.	
Activity NHCI-1.1: Formalize, expand, and convene the Native Hawaiian Cultural Working Group.	OHA
Activity NHCI-1.2: Engage the Native Hawaiian Cultural Working Group in the development of a Monument Cultural Resources Program.	OHA
Activity NHCI-1.3: Establish an annual cultural resources exchange.	OHA
Strategy NHCI-2: Develop and annually maintain partnerships with Native Hawaiian organizations and institutions.	
Activity NHCI-2.1: Continue to expand and explore opportunities to partner with institutions serving Native Hawaiians.	OHA
Strategy NHCI-3: Identify and integrate Native Hawaiian traditional knowledge and management concepts into Monument management annually for the life of the plan.	
Activity NHCI-3.1: Engage the Native Hawaiian community to identify how traditional knowledge will be integrated into Monument activities.	NOAA
Activity NHCI-3.2: Use and integrate Native Hawaiian traditional knowledge in Monument management activities.	NOAA

3.5.4 Ocean Ecosystems Literacy Action Plan

Desired Outcome

Cultivate an ocean ecosystems stewardship ethic, contribute to the Nation’s science and cultural literacy, and create a new generation of conservation leaders through formal environmental education.

Links to other Action Plans	
All action plans in:	
3.1	Understanding and Interpreting the NWHI
3.2	Conserving Wildlife and their Habitats
3.3	Reducing Threats to Monument Resources
3.4	Managing Human Uses

Current Status and Background

Prior to the establishment of the Monument, the Co-Trustees took active steps to address the need for ocean ecosystems literacy. Adopting a cooperative approach has exponentially enhanced and extended the agencies’ educational efforts. Educational partnerships have enabled the implementation of programs far beyond the resources of any one agency, institution, or organization alone.

Links to Goals
Goal 5
Goal 6
Goal 8

The NWHI provide a model and rare benchmark of a healthy, intact ecosystem, conserved in its natural state, that may serve to inspire Hawai’i residents, all Americans, and the global community to take part in ocean restoration efforts. Inspired by the Polynesian Voyaging Society, this guiding premise brought together resource management agencies and partners to implement the multiyear “Navigating Change” project, which focuses on raising awareness and motivating people to change their attitudes and behaviors to better care for Hawai’i’s land and ocean resources. A five-part video, standards-based educational curriculum, and teleconferences with the traditional Polynesian voyaging canoe *Hōkūle‘a* during its 2004 expedition to the NWHI have been completed in partnership with several agencies and organizations. Teacher workshops on the “Navigating Change” program have been held since 2003 across Hawai’i. The MMB also organized a number of education-at-sea initiatives.

The multiagency educational partnership remains active and fluid and continues to work well, even in the absence of formal agreements because of the clear benefits to all parties. Shared objectives include information sharing, aligning education with management needs, setting regional priorities, reducing duplication of efforts, and sharing resources. Through partnering, organizations and agencies are better able to meet their educational mandates. Partnerships take advantage of existing expertise and experience, as well as preexisting markets for educational outreach. Cost and staff sharing of education and outreach programs help to alleviate limited funding and staffing issues for these programs.

Mokupāpapa: Discovery Center for Hawai’i’s Remote Coral Reefs

The Reserve built a visitor/education center collocated with its Hilo office to



Students visit Mokupāpapa Discovery Center in Hilo.
Photo: James Watt

spur greater public awareness of the region and ocean conservation issues. Mokuapāpapa: Discovery Center for Hawai‘i’s Remote Coral Reefs was conceived and built in 2003 to interpret the natural science, culture, and history of the NWHI and surrounding marine environment. The 4,000-square-foot center brings the region to people by proxy, since most will never have the opportunity to visit the area. At the time of this publication, more than 300,000 people have been exposed to the wonders of the NWHI through the center. The center has served as a physical hub of learning, regularly hosting well-attended educational talks, summer programs, and activities, while drawing a constant stream of field trips for school and community groups from around the State and beyond.

Need for Action

The U.S. Commission on Ocean Policy (2004) stressed the need to strengthen the nation’s ocean awareness and to improve ocean-related education efforts as “critical to building an ocean stewardship ethic, strengthening the nation’s science literacy, and creating a new generation of ocean leaders.” The report concluded that an interested, engaged public is an essential prerequisite “to successfully address complex ocean- and coastal-related issues, balance the use and conservation of marine resources, and realize future benefits from the ocean.”

The President’s Ocean Action Plan places a major emphasis on ocean-related awareness and education. This action plan addresses the need to build upon our environmental education efforts to cultivate students as an informed, involved constituency that cares about restoring, protecting, and conserving our precious ocean resources. Strengthening awareness of the importance of the NWHI as a model of a wild marine ecosystem being maintained in its natural state requires a heightened focus on stewardship values and resource management issues through both formal and informal education efforts. School curricula, starting in kindergarten, will expose students to ocean issues and prepare the next generation of scientists, managers, educators, and leaders through diverse educational opportunities. Furthermore, students’ increased understanding is anticipated to naturally influence their families, extending the extracurricular reach of the Monument’s educational activities.

Strategies to Achieve the Desired Outcome

Monument staff will work closely with existing and new partners to further their environmental education goals. Two strategies have been identified to cultivate an ocean ecosystem ethic, strengthen the nation’s science literacy, and create a new generation of conservation leaders. The strategies and activities are coded by the acronym for the action plan title, “Ocean Ecosystems Literacy” (OEL). A summary of strategies and activities is provided in Table 3.5.4 at the end of this action plan.

- OEL-1: Develop and implement educational programs in Hawai‘i to increase ocean ecosystems literacy and promote stewardship values within 5 years.
- OEL-2: Develop and implement new tools to “bring the place to the people” with a focus on students, within 3 years.

Strategy OEL-1: Develop and implement educational programs in Hawai‘i to increase ocean ecosystems literacy and promote stewardship values within 5 years.

A coordinated and long-term strategy for mainstreaming NWHI and ocean ecosystem stewardship values-based educational materials into Hawai‘i’s schools will be developed. Appropriate educational materials and curricula geared to improve ocean literacy, understand climate change and increase ocean stewardship will be developed in concert with the NWHI education partnership and the State of Hawai‘i Department of Education, Independent Schools of Hawai‘i, Nā Lei Na‘auao Native Hawaiian Charter School Alliance, and the Charter School Association of Hawai‘i. Materials developed through activities in other action plans will be used as resource and support materials for development of curricula. Programming will also be developed in the Hawaiian language for use in Hawaiian language immersion and culture-based charter schools. Ultimately, increased knowledge of ocean ecosystems issues, in particular of the NWHI, will allow Hawai‘i’s children, their families, and lifetime learners to be more active ocean stewards and to better understand the issues related to ocean management and climate change.

Activity OEL-1.1: Expand and improve the NWHI educational partnership’s Navigating Change curriculum for elementary and middle school students, with increased focus on ocean ecosystems literacy, within 3 years.

Building on existing NWHI-based curricula developed under the Navigating Change partnership and the new Hawai‘i Marine Curriculum, the MMB will contract with curricula developers to improve and expand “A Teacher’s Guide to Navigating Change.” Additional study units will be added for the current guide targeted at 4th and 5th grade students, and units focusing on other grade levels will be developed. As the effects of climate change are further studied and potential mitigations are identified, a unit on this topic will be developed. External grants for curricula development will also be sought. Education partners will work with the Department of Education and private and charter schools as curricula are being developed to ensure that the department’s and schools’ needs are incorporated into the work and to facilitate incorporation of the new curricula into existing educational programming. Whenever possible, families will be drawn into the lesson plans and activities. Planting the seed of awareness in young minds and those of their families concerning alien species, climate change and ocean acidification, and marine debris cleanup and prevention issues will effectively support long-range prevention efforts to deal with these threats.

Activity OEL-1.2: As curricula are developed, work with Hawaiian-language immersion schools to ensure the curricula meet their needs, including translation into the Hawaiian language.

The Navigating Change partnership will work closely with the Native Hawaiian community to ensure appropriate cultural information is included within all curricula, and that the units meet the needs of Hawaiian-language immersion and culture-based charter schools.

Activity OEL-1.3: Develop an ocean stewardship program for middle school and high school students within 5 years.

In concert with development of Navigating Change educational materials for primary schools, an ocean stewardship program will be developed with educational partners to give middle and high school students real-world, hands-on experience with the issues of ocean management. Real

examples from the Monument will be used as the basis for the science- and culture-based program, which will use educational activities such as interviews with people in the student's communities, and collecting and analyzing research data to resolve management issues. Through these activities, students will be encouraged to apply their newfound knowledge to help restore the ecosystems closer to their homes.

Activity OEL-1.4: Conduct at least four teacher workshops in the main Hawaiian Islands per year to introduce and support the elementary school and middle/high school environmental education programs.

Teacher workshops to present and demonstrate the use of Monument-developed educational materials, activities, and curricula, as well as those developed with partners, are effective ways to get Monument-based information into classrooms and informal education venues. Development and distribution of educational materials is not enough; teachers are often overwhelmed by available materials and should be taught how to use them, assisted in implementing materials in their classrooms, and supported by follow-up activities.

Activity OEL-1.5: Continue Teacher and Class-at-Sea programs on an annual basis.

In 2005, the first teacher and class-at-sea educational expedition to the NWHI was conducted. During NOAA vessel allocation meetings, NOAA agreed to accommodate annual education missions aboard one of the several research vessels active in the NWHI. Teachers who have been active in using existing Monument educational materials will be chosen to participate in these educational cruises, and select students will be sought. These programs allow teachers and students who are active in learning about the NWHI to experience the area firsthand and share the wonder of the place with the rest of the educational community. Annual expeditions will be planned in conjunction with educational opportunities with state and FWS partners. Monument educational materials developed in activity OEL-1.3 will be used during these expeditions. For linked activities, see also the Native Hawaiian Culture and History Action Plan, strategy NHCH-5, in Section 3.1.2.

Activity OEL-1.6: Expand educational programs for school groups at Mokupāpapa: Discovery Center for Hawai'i's Remote Coral Reefs to host at least ten groups per month.

Educational programming at the Monument's premier education and outreach venue, Mokupāpapa: Discovery Center for Hawai'i's Remote Coral Reefs, will be expanded. Working closely with local public, private, and charter schools, Discovery Center staff will create educational partnerships to promote Mokupāpapa as an educational facility and field trip venue. Discovery Center staff will collaborate with the Monument's educational partners to co-develop standards-based education programs at the Discovery Center for K-12 students. Visitation calendars, pre- and post-visit teacher background and activities packets, and volunteer docent capacity will be developed to meet the various needs of school and community groups. Expanded programming, such as guided tours in the Hawaiian language, monthly talks, tide pool classes, and reef-at-night visits to the aquarium, will provide continuing education opportunities for adults. Discovery Center staff will work with partner facilities and agencies on Hawai'i Island to codevelop on- and off-site programming, where appropriate, and to develop an education strategy and identify areas of collaboration.

Activity OEL-1.7: Provide annual wildlife-dependent educator and conservation leader workshops at Midway Atoll, targeting a mix of formal and informal educators and community and conservation leaders and building upon Navigating Change curricula and vision.

One goal of these educator and conservation leader workshops is to inspire a new group of educators as a method of connecting students and lifelong learners to Hawai‘i’s wildlife and culture. Another goal is to have participants in these workshops actually propose and implement an environmental stewardship program in their community, utilizing their experience at Midway as inspiration. The major themes discussed during these workshops could provide the stepping stones for future development of educational activities such as telepresence, distance learning projects, and ocean stewardship programs.

Agency planning for Midway Atoll educator workshops began in 2007, and a focus group of teachers, curriculum developers, educational leaders, and Navigating Change Educational Partnership members held a planning workshop on Midway Atoll in January 2008. Co-Trustee education staff will be coordinating and conducting these workshops with input from previous classes of workshop attendees, collectively referred to as Alaka‘i. As curricula geared at new grade levels and targeting different audiences are developed, the number of educator workshops offered within the Monument may increase. Offering more educators and conservation leaders the opportunity to experience Midway Atoll and bring the Monument back to their students and lifetime learners will be an important role for Midway in the coming years.

Activity OEL-1.8: Facilitate at least two opportunities per year for educational groups, private/nonprofit environmental, or historical organizations to conduct wildlife-dependent or historical courses or to administer informal educational camps, within 2 years.

Organizations have already shown their interest in using Midway for educational experiences, since it provides unparalleled wildlife-dependent educational opportunities. Sponsoring organizations will be responsible for providing instructors and leading their participants. Monument staff will provide guidance during a mandatory advance orientation. When possible, Monument staff can provide learning opportunities that engage participants in biological and historical projects such as habitat restoration or historic preservation. FWS staff will also monitor group activities to ensure Midway’s wildlife and historic resources are protected.

The MMB also will collaborate with universities to offer semester internship opportunities for students interested in resource management, cultural studies, history, or natural sciences. In the future, the MMB will investigate opportunities to bring select middle and high school students to Midway for courses in atoll ecosystems. The MMB supports expanding environmental education opportunities to the extent feasible on Midway Atoll. Developing lower-cost housing, increasing classroom and laboratory space, providing grants to help cover their costs at Midway, and finding a lower-cost means of transportation, will facilitate these programs. An opportunity to study Midway’s unique natural resources could be the catalyst to inspire lifelong devotion to the field of science.

Activity OEL-1.9: Build formal evaluations into education programs within 2 years.

Evaluation of education and outreach programs and activities is critical to ensuring that the MMB is achieving its desired goals and reaching target audiences. This information is also

useful in helping to redesign current efforts to be more successful. Formal evaluations take time, expertise, and will require external assistance in development.

Strategy OEL-2: Develop and implement new tools to “bring the place to the people,” with a focus on students, within 3 years.

The Monument will serve as a powerful focal point for increasing ocean literacy in Hawai‘i, the nation, and the world. To engage a broad and diverse base of students around the world, the MMB will continuously expand the types of products and modes of communication used in educational programs. The MMB will benefit from continually exploring new research initiatives, new technologies, and best management practices that may advise its efforts and enhance its ability to restore, protect, and conserve Monument resources.

Activity OEL-2.1: Identify and prioritize research and development projects to increase ocean ecosystems literacy and conservation in NWHI.

The MMB, working together with educational partnerships and other relevant groups, including the private sector, will identify and prioritize research and development projects for new products and innovative technologies that could be employed to increase ocean ecosystems literacy and support for conservation of the NWHI. These tools may include technologies for making remotely collected scientific data available for education purposes on a real-time basis, and the possibility of hosting student research projects in the Monument, similar to what NASA does with the space shuttle and space station. Since the challenges of increasing awareness of the Monument have been likened to those involved in increasing understanding of space, the MMB will work with NASA to learn from their extensive education programs.

Activity OEL-2.2: Use telepresence technology for educational and outreach activities within 5 years.

Telepresence is an important tool for helping to educate the larger community about the special ocean region of the NWHI. Since most people will not be able to visit the NWHI because of its remoteness and fragility, it is important to bring the place to the people. Technologies such as underwater video cameras, real-time video transmission, virtual field trips, formal distance learning programs, website interfaces, and exhibits in discovery centers can play an important role in educating students and the public about the NWHI. Obstacles to implementing these technologies do exist, such as cost, feasibility, and ecological sensitivities, but the MMB will continue to invest in and use new technologies for providing this virtual experience.

Table 3.5.4 Summary of Strategies, Activities, and Agency Leads for Ocean Ecosystems Literacy

Strategies and Activities	Agency Lead
Strategy OEL-1: Develop and implement educational programs in Hawai‘i to increase ocean ecosystems literacy and promote stewardship values within 5 years.	
Activity OEL-1.1: Expand and improve the NWHI educational partnership’s Navigating Change curriculum for elementary and middle school students, with increased focus on ocean ecosystems literacy, within 3 years.	NOAA
Activity OEL-1.2: As curricula are developed, work with Hawaiian-language immersion schools to ensure the curricula meet their needs, including translation into the Hawaiian language.	NOAA
Activity OEL-1.3: Develop an ocean stewardship program for middle school and high school students within 5 years.	NOAA
Activity OEL-1.4: Conduct at least four teacher workshops in the main Hawaiian Islands per year to introduce and support the elementary school and middle/high school environmental education programs.	NOAA
Activity OEL-1.5: Continue Teacher and Class-at-Sea programs on an annual basis.	NOAA
Activity OEL-1.6: Expand educational programs for school groups at Mokupāpapa: Discovery Center for Hawai‘i’s Remote Coral Reefs to host at least ten groups per month.	NOAA
Activity OEL-1.7: Provide annual wildlife-dependent educator and conservation leader workshops at Midway Atoll, targeting a mix of formal and informal educators and community and conservation leaders and building upon Navigating Change curricula and vision.	FWS NOAA
Activity OEL-1.8: Facilitate at least two opportunities per year for educational groups, private/nonprofit environmental, or historical organizations to conduct wildlife-dependent or historical courses or to administer informal educational camps, within 2 years.	FWS
Activity OEL-1.9: Build formal evaluations into education programs within 2 years.	NOAA
Strategy OEL-2: Develop and implement new tools to “bring the place to the people,” with a focus on students, within 3 years.	
Activity OEL-2.1: Identify and prioritize research and development projects to increase ocean ecosystems literacy and conservation in NWHI.	NOAA
Activity OEL-2.2: Use telepresence technology for educational and outreach activities within 5 years.	NOAA

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3.6 Achieving Effective Monument Operations

3.6.1 Central Operations Action Plan

3.6.2 Information Management Action Plan

3.6.3 Coordinated Field Operations Action Plan

3.6.4 Evaluation Action Plan

3.6 Achieving Effective Monument Operations

Monument operations provide the support system for implementing strategies and activities described in other action plans. This support system includes improvement and maintenance of infrastructure in Honolulu to support field sites in the NWHI, information management, coordination of field operations and improvement and maintenance of field infrastructure, and program evaluation for both Honolulu and field sites.

Action plans to achieve effective operations focus on building and maintaining the vital personnel and infrastructure needs, both on land and at sea. The Information Management and Evaluation Action Plans (Sections 3.6.2 and 3.6.4) describe programs and functions necessary to effectively carry out and assess the effectiveness of all other action plans. Each action plan consists of a set of strategies and corresponding activities to address a desired outcome. The desired outcomes of these action plans over the 15-year planning horizon are as follows:

- **Central Operations:** Conduct effective and well-planned operations with appropriate human resources and adequate physical infrastructure in the main Hawaiian Islands to support management of Papahānaumokuākea Marine National Monument.
- **Information Management:** Consolidate and make accessible relevant information to meet educational, management, and research needs for Papahānaumokuākea Marine National Monument.
- **Coordinated Field Operations:** Coordinate field activities and provide adequate infrastructure to ensure safe and efficient operations while avoiding impacts to the ecosystems in the Papahānaumokuākea Marine National Monument.
- **Evaluation:** Determine the degree to which management actions are achieving the vision, mission, and goals of Papahānaumokuākea Marine National Monument.

Action plans described in this section will be implemented through close coordination among the MMB and in conjunction with other priority management needs.

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3.6.1 Central Operations Action Plan

Desired Outcome

Conduct effective and well-planned operations with appropriate human resources and adequate physical infrastructure in the main Hawaiian Islands to support management of Papahānaumokuākea Marine National Monument.

Links to other Action Plans
All action plans

Current Status and Background

The Hawaiian Islands NWR, Midway Atoll NWR, NWHI Coral Reef Ecosystem Reserve, NWHI Marine Refuge, and State Seabird Sanctuary at Kure Atoll were established prior to 2006, and remain part of the Monument. The MMB agencies had varying levels of human resources and facility infrastructure in place when the Monument was established. The majority of the staff and administrative support is located in Honolulu. Outreach and other activities are conducted at other locations within the main Hawaiian Islands, and some on-site management is conducted as needed at a few sites within the Monument.

Links to Goals
Goal 1 Goal 4

The FWS and its preceding natural resource agencies have conducted management activities in the NWHI since the establishment of the Hawaiian Islands NWR in 1909. Full-time staff were assigned for administrative and logistical support in 1979 when the U.S. Coast Guard abandoned its presence at French Frigate Shoals. These FWS operations in support of the Hawaiian Islands NWR were first conducted at Kīlauea Point NWR on the island of Kaua‘i, and were later moved to the central FWS refuge office in Honolulu. FWS assumed wildlife management responsibilities at Midway Atoll NWR in 1988.

The FWS currently maintains numerous Monument staff, in diverse roles, in Honolulu in the Prince Jonah Kūhiō Kalaniana‘ole Federal Building. Support also is provided by other FWS staff within the federal building, including from the Hawaiian and Pacific Islands National Wildlife Refuge Complex, the Pacific Islands External Affairs and Visitor Services, and the Pacific Islands Fish and Wildlife Office. Both the Hawaiian Islands and Midway Atoll NWRs, under the Monument staffing structure, maintain staff in Honolulu and in the NWHI (see Section 3.6.3, Coordinated Field Operations Action Plan). In addition to the facilities at the federal building, FWS maintains a bunkhouse and storage facility in the Kapahulu area of Honolulu. This facility, while periodically available for FWS Monument needs, is administered by and primarily serves the Pacific Remote Islands National Wildlife Refuge Complex.

Much of the necessary NOAA-related infrastructure and personnel were established while implementing the Reserve from 2001 to the present. This infrastructure included the creation of an office in Hilo and an office in Honolulu, hiring of key staff, and the design, construction, and opening of the Mokuāpāpā: Discovery Center for Hawai‘i’s Remote Coral Reefs in Hilo.

Prior to Monument designation, Reserve staff carried out operations specific to the Reserve while devoting a considerable amount of time working toward the designation of the Reserve as a national marine sanctuary. Because of these demands, staff size increased steadily between 2000 and 2005, with most staff managing multiple diverse roles and becoming more centralized in the

Honolulu office. In 2004, Honolulu Reserve staff located to offices shared by the NMSP Pacific Region and Hawaiian Islands Humpback Whale National Marine Sanctuary. Also in 2004, NOAA began plans to relocate all Hawai‘i NOAA offices to a new consolidated Pacific Regional Center on Ford Island by 2010. The Mokuāpapa: Discovery Center exceeded expectations for the number of annual visitors in its first year of operation requiring additional staff for managing the facility.

In 2006, when the NWHI were designated as a marine national monument by Presidential Proclamation 8031, staff involved in managing the Hawaiian Islands NWR, Midway Atoll NWR, and the Reserve became Monument staff and immediately began carrying out a rolling implementation of management of the newly designated Papahānaumokuākea Marine National Monument.

NMFS provides management support and program coordination for the Monument from the Pacific Islands Regional Office (PIRO), located in downtown Honolulu. Established in 2004, PIRO has increased its resources to meet a growing number of regional, national and international requirements. In addition to senior leadership direction, a NMFS Management Officer was reassigned from existing staff to directly support the development and implementation of Monument activities. NOAA’s Pacific Islands Fisheries Science Center, located adjacent to the University of Hawai‘i’s Mānoa campus, supports a variety of scientific activities taking place within the Monument.

The State of Hawai‘i has had an active presence in monitoring and managing resources in NWHI, starting with assessing and managing fisheries in the 1950s and continuing with the on-site management of Kure Atoll in the late 1980s when the U.S. Coast Guard returned atoll management to the State. Resources under state jurisdiction are mainly managed by the DLNR. The key line offices for undertaking this management are the Division of Aquatic Resources and the Division of Forestry and Wildlife, both administrative offices located in the Kalanimoku Building in downtown Honolulu. Staff involved in the management of the Monument are located at this site and are also collocated with NOAA staff at its offices in Hawai‘i Kai. Staff involved in the management of the State NWHI Marine Refuge immediately began carrying out rolling implementation of the Monument as the needs of comanagement evolved. While state staff involved in Monument operations have not grown in the past few years, recent state administrative and legislative action has created additional positions to implement state Monument activities.

In addition to those activities undertaken at the state administrative offices, staff involved in the management of the State Seabird Sanctuary at Kure Atoll are located at the Division of Forestry and Wildlife baseyard. All staff associated with the support of wildlife activities in the O‘ahu district (of which Kure is a component) are located at this site. The Division of Aquatic Resources also has an additional site for staging all boating and diving operations at its Ānuenu Fisheries Research Facility at Sand Island in Honolulu Harbor.

Additional support activities, including conservation enforcement, alien species response, emergency response, and historic preservation, are located throughout the DLNR and the Department of Health.

OHA serves as a member of the MMB, and, along with the Native Hawaiian Cultural Working Group, represents Native Hawaiian interests on Monument matters. The nine OHA trustees and OHA's main administrative staff are housed in the Pacific Plaza Building in Honolulu, with community resource offices on five of the main Hawaiian Islands, including two offices on Hawai'i Island.

Volunteers currently provide support to the Monument in a number of locations, including administrative offices, the Mokupāpapa Discovery Center in Hilo, French Frigate Shoals, Laysan Island, Midway Atoll, and Kure Atoll. These volunteers help Monument staff in carrying out their missions to protect the natural, cultural, and historic resources of the Monument (see Section 3.5.2, Constituency Building and Outreach Action Plan).

Need for Action

Effectively managing such an extraordinary and high profile marine conservation project requires a strong operational foundation to support management goals. Operational support of on-site management and day-to-day operations require that highly trained and experienced staff are maintained and recruited to implement the strategies and activities described throughout this management plan. Volunteer services are also needed to augment this staff. In addition, the appropriate physical infrastructure must be in place to support operations. Each of the MMB agencies currently has infrastructure to maintain and possibly collocate both in Honolulu and elsewhere in the main Hawaiian Islands. Successful site operations are achieved through a synergy of personnel and available resources. This action plan presents strategies and activities designed to implement the shared facilities, coordinated schedules, and cooperative agreements required to achieve effective site operations.

Strategies to Achieve the Desired Outcome

Three strategies have been identified to ensure the necessary human resources, physical infrastructures, and administrative procedures are in place to successfully manage the Monument. The strategies and activities are coded by the acronym for the action plan title, Central Operations (CO). A summary of strategies and activities is provided in Table 3.6.1 at the end of this action plan.

- CO-1: Coordinate annual site operations planning and implementation over the life of the plan.
- CO-2: Assess and enhance human resource and organizational capacity over the life of the plan.
- CO-3: Assess and enhance physical infrastructure and facilities, as necessary, in the main Hawaiian Islands over the life of the plan.

Strategy CO-1: Coordinate annual site operations planning and implementation over the life of the plan.

Monument management agencies develop annual operating plans guided by their agency policies and procedures and consistent with the Monument Management Plan. These individual agency operating plans may be integrated to the extent possible to better guide day-to-day activities based on budget allocations to ensure efficient and effective use of public resources.

Activity CO-1.1: Coordinate and implement annual operating plans.

Annual operating plans will be developed and coordinated in accordance with agency requirements and guided by site-specific needs articulated in planning documents and based upon funding availability. The results of annual evaluation activities and current priorities will be reviewed and considered in developing annual operating plans (see Section 3.6.4, Evaluation Action Plan). Financial administration includes budget tracking, managing the financial portions of memoranda of understanding and contracts, and purchasing and travel planning according to state and federal purchasing regulations. Administrative procedures and functions also include planning for emergencies to ensure staff safety; complying with programmatic reporting requirements; records retention; purchasing and maintaining equipment, supplies, and vehicles; maintaining communication equipment including telephones, cellular phones, satellite phones and connections, and radios, as well as communication policy. Although each agency will follow their own procedures, activities will be coordinated to the extent possible to increase efficiencies and, where possible, standard operating procedures will be developed to outline roles and responsibilities as needed.

Strategy CO-2: Assess and enhance human resource and organizational capacity over the life of the plan.

Both human resource and organizational capacity are needed to achieve effective site operations. With the proclamation announcement comes high expectations for the Monument to implement management actions in a short amount of time. To effectively meet Monument goals, the MMB will develop a strong operational framework of human resources as early as possible. Human resources and organizational capacity may be increased to carry out programs, including administration, research and monitoring, threat reduction, education and outreach, information management, and enforcement.

Activity CO-2.1: Regularly assess current status and future needs for human resources.

In order to implement the Monument Management Plan effectively, human resource and organizational capacity needs will be regularly assessed. These assessments will be used to organize and better utilize existing staff, and identify technical and administrative human resource overlaps and gaps. The assessments will also identify and prioritize capacity building opportunities, and regional capacities and opportunities to coordinate and share resources with partners. Alternative human resource capacity-building measures, such as internships, volunteer programs, and partnerships, will be considered in the assessments as a means to increase staffing capacity.

Activity CO-2.2: Improve human resources and organizational capacity.

As funding, field-based housing, and other factors allow, the human resource and organizational capacity of the Monument will be enhanced to address specific needs and carry out the strategies and activities contained within the Monument Management Plan. Human resource development includes staff recruitment, retention, recognition, training, communication, regular meetings, time and attendance, as well as staff safety.

Strategy CO-3: Assess and enhance physical infrastructure and facilities, as necessary, in the main Hawaiian Islands over the life of the plan.

Effective and efficient human resources must be supported by sufficient physical infrastructure resources. Efforts will be ongoing to maintain existing facilities in the main Hawaiian Islands and design and improve facilities as required to support Monument administration and operations and to ensure compliance with the ADA.

Activity CO-3.1: Regularly assess current status and future needs for infrastructure and facilities.

In conjunction with assessments of human resource needs, infrastructure and facilities needs will also be reviewed to optimize facilities utilization. These assessments will aim to organize and better utilize existing facilities and infrastructure in the main Hawaiian Islands, identify physical resource overlaps and gaps, and identify needs to support projected future growth and collocation. These assessments will also identify and prioritize capacity building opportunities, and regional capacities and opportunities to coordinate and share resources with partners.

Additional educational venues, such as Mokuapāpapa, will be considered for development as stand-alone facilities or in partnership with existing educational and interpretive facilities. Additional consideration will be given to the already planned and scheduled NOAA transition to the NOAA consolidated facility.

Activity CO-3.2: Maintain and improve infrastructure and facilities.

Maintenance and retention of current physical assets and the procurement or lease of additional assets will be driven by need and available funding. All efforts will be made to combine utilization of assets among MMB agencies for more efficient use of available resources.

Activity CO-3.3: Improve information technology infrastructure.

Computer and information technology are an integral part of site infrastructure. Appropriate equipment will be acquired, upgraded, and maintained to meet management needs. New technologies will be regularly integrated (see Section 3.6.2, Information Management Action Plan).

Table 3.6.1 Summary of Strategies, Activities, and Agency Leads for Central Operations

Strategies and Activities	Agency Lead
Strategy CO-1: Coordinate annual site operations planning and implementation over the life of the plan.	
Activity CO-1.1: Coordinate and implement annual operating plans.	NOAA State of Hawai‘i FWS OHA
Strategy CO-2: Assess and enhance human resource and organizational capacity over the life of the plan.	
Activity CO-2.1: Regularly assess current status and future needs for human resources.	NOAA State of Hawai‘i FWS OHA
Activity CO-2.2: Improve human resources and organizational capacity.	NOAA State of Hawai‘i FWS OHA
Strategy CO-3: Assess and enhance physical infrastructure and facilities, as necessary, in the main Hawaiian Islands over the life of the plan.	
Activity CO-3.1: Regularly assess current status and future needs for infrastructure and facilities.	NOAA
Activity CO-3.2: Maintain and improve infrastructure and facilities.	NOAA
Activity CO-3.3: Improve information technology infrastructure.	NOAA

3.6.2 Information Management Action Plan

Desired Outcome

Consolidate and make accessible relevant information to meet educational, management, and research needs for Papahānaumokuākea Marine National Monument.

Links to other Action Plans
3.1.1 Marine Conservation Science
3.1.4 Maritime Heritage
3.3.1 Permitting
3.3.2 Alien Species

Current Status and Background

Biogeographic studies, bathymetric spatial data, temporal analyses, research notes, maritime heritage data, Native Hawaiian cultural research, historic charts, published field project results, and other data all comprise the large and varied collection of NWHI information. These data sets include databases, oral histories, raw scientific results, physical specimens, and digital imagery. This collection has in the past been scattered among federal and state agencies, universities, museums, and other agencies and institutions in varied formats, and some has simply remained in the possession of the individual investigator. Often, the data are not adequately documented, creating the need for resource intensive validation for future integration purposes. Both the data and associated documentation are needed in order to be useful for long-term ecosystem-based management.

Links to Goals
Goal 1
Goal 2
Goal 3
Goal 4

Strategic efforts to address the broad issue of data management for the NWHI have begun. Multiagency Reef Assessment and Monitoring Program expeditions in the NWHI, begun in 2000, represent an initial attempt to establish a multiagency data clearinghouse for management purposes. To date, only a portion of the many years of existing NWHI data have been processed and made available.

Several complementary projects have been initiated to address information management needs. A GIS spatial bibliography database for the NWHI is under development. This GIS incorporates georeferenced journal articles, gray literature and other sources of information into a spatially reference on-line search tool. Additionally, an annotated bibliography of cultural resources for the NWHI is available on line at <http://www2.bishopmuseum.org/noaanwhi/index.asp>, which incorporates past cultural, geological, and biological studies in the NWHI. This annotated bibliography of past cultural, geological, and biological studies in the NWHI was created with the support of NOAA’s National Ocean Service and the Reserve. The resources catalogued are primarily available in the Bishop Museum Library and Archives, the libraries at the University of Hawai‘i at Mānoa, and the State of Hawai‘i Archives. Additionally, the Office of Hawaiian Affairs is developing an archipelago-wide Wahi Pana Database of cultural information, and the MMB is working to integrate this database with other Monument data sets.

The MMB also participates in the ONMS Information Management and Spatial Technology (IMaST) plan for all field sites. The IMaST plan organizes the many spatial resources within the National Marine Sanctuary System and makes them available to all sites and partner staff needing geospatial information, data, training, software, hardware, and hands-on experience. IMaST enhances capacity and integrates capabilities for site and national program staff in the utilization of geospatial technology.

Additionally, the MMB has initiated the development of a field-based data collection tool that will help to facilitate collection of research and vessel activity data from scientific expeditions conducted aboard research vessels active in the NWHI. This system will help to meet permit criteria for data management and reporting, and will assist in data entry, metadata recording, and data integrity. This system is one component of the larger information management system that is addressed in strategies outlined below and is already being developed based on management data needs.

Need for Action

Access to accurate information is essential to implement an adaptive, ecosystem approach to the management of the Monument. A large amount of data have been, and will continue to be, collected on the NWHI environments by various state, federal, and academic institutions, as well as private-sector partners. Presently, results of research efforts are in multiple independent locations and in formats not readily available to resource managers, who need access to pertinent characterization information and up-to-date reports as a basis to make decisions for the protection of ecosystems. To address this difficulty, this action plan presents strategies and activities to develop a comprehensive data management and retrieval system, and to consolidate and organize information gathered from diverse sources, thus ensuring that stakeholders will share access to an expanding repository of knowledge on the NWHI.

Strategies to Achieve the Desired Outcome

Research and information compilation on the Monument is ongoing; therefore, gathering and consolidating that information is also an ongoing process. A comprehensive approach is critical to achieving the desired outcome, which is to ensure that relevant information is collected and integrated in a standardized and useable manner, consolidated, and made accessible. Only a broad and comprehensive approach can ensure that information management will promote data gap analysis for the purposes of management and research. The Monument will not duplicate data, but along with partners, has already begun to build a decentralized information system that allows data discovery and access while allowing principal investigators and major agencies to house and maintain their own data.

The MMB will create the Papahānaumokuākea Information Management System (PIMS), a crucial tool for integrated management of the Monument. Aggregated data in the PIMS will provide material for multiple purposes, including outreach and education products, Monument management and evaluation, regional coordination among partners, and comparative data for regional research work. As a clearinghouse node for information, the PIMS must ensure that appropriate material is made available to managers, researchers, and the public in a timely manner. Some of the data available for management or research purposes may be of a sensitive nature and, therefore, not appropriate for public and education-focused release. Security procedures and policies will be in place to ensure that only appropriate users can access specific data, including proprietary cultural information.

Through the PIMS, managers will have access to integrated biogeographic and spatial analyses, maps, and reports that define the characterization of the ecosystem diversity, maritime heritage data, and Native Hawaiian cultural information to aid in evaluating the interaction and effectiveness of past, current, and future management efforts. Management of information in a

manner that is responsive to the changing needs of the Monument is part of an adaptive, ecosystem-based management system and ensures that NWHI research will be fully valued. The following strategies are designed to consolidate and make more readily available the abundance of useful information on the NWHI for management, research, education, and enforcement purposes. The strategies and activities are coded by the acronym for the action plan title, “Information Management” (IM). A summary of strategies and activities is provided in Table 3.6.2 at the end of this action plan.

- IM-1: Within 5 years, develop and implement a system for handling Monument data.
- IM-2: Within 5 years, facilitate appropriate access and use of PIMS.

Strategy IM-1: Within 5 years, develop and implement a system for handling Monument data.

The sources and types of NWHI data are diverse and do not necessarily adhere to uniform data management. For all data to be accessible by the PIMS, data protocols and Federal Geographic Data Committee-compliant metadata standards will be implemented. These standards must also adhere to existing data management and metadata protocols established by the federal government. Agreements between various agencies for data sharing, access, security, and use must also be developed and implemented.

Activity IM-1.1: Develop and implement a data discovery, inventory, and acquisition strategy.

A data discovery, inventory, and acquisition strategy will be developed and implemented based on meetings and workshops with partners and other organizations. The strategy will identify the types, format, and sources of existing information and data sets, as well as potential new data sources. Workshops will be held annually to review progress of data acquisition and revise the strategy as needed.

Activity IM-1.2: Develop appropriate data management protocols, procedures, and agreements with partner agencies.

One of the first tasks in information management, after data sources have been identified, is to develop and implement protocols for how data are collected, documented, stored, and shared, as well as their schema and format. Existing metadata standards within NOAA will be utilized to document the data. Agreements with data providers to define use and access restrictions, as well as data transfer methods, will be developed. A shipboard data collection tool is currently being developed and implemented aboard the NOAA ships active in the NWHI. This tool will help to facilitate data capture, standardization, and chain of custody. A rigorous quality assurance/quality control protocol will be developed and implemented to maintain information and data quality in the system in accordance with the Data Quality Act (Public Law 106-554). A long-term strategy for data assimilation and review will be developed in conjunction with data providers.

Activity IM-1.3: Continue to design, build, and maintain the Papahānaumokuākea Information Management System.

An information and database management system is being designed, developed, and configured to meet a broad spectrum of needs of the MMB, including Monument program and site applications, research and educational needs, and public access. The system is built on a sophisticated data model implemented in a relational database, and incorporates custom applications for spatial data management, tabular data management, data import/export and reconciliation, and reporting as an integral part of the data management strategy. Storage and security of data, as well as ease of access, are some of the issues that are being addressed. Agreements with data providers developed in the previous activity (IM-1.2) will be essential to the success and utility of this system, since the PIMS is not a massive data archive but is instead a system that defines interrelationships between distributed data sources, which are the vast majority of data. The PIMS stores some data that are not already maintained by other partner agencies, such as image and video data, and the spatial bibliography.

Activity IM-1.4: Begin incorporating information into PIMS.

A significant amount of effort will be involved in data entry, formatting, and regular review. A long-term strategy for data assimilation and review processes will be developed in conjunction with data providers. The prioritization of data entry will be based on specific management and scientific questions. This activity will initiate in-depth analyses to answer these questions. The data needed and accessed for these analyses will be documented and loaded into the inventory. Collaborative links to data that are being maintained by partners will be created and maintained to ensure seamless access to these data. Co-Trustee agencies will make data collected in the Monument available to the PIMS system.

Strategy IM-2: Within 5 years, facilitate appropriate access and use of PIMS.

Tools and protocols to access the data in PIMS need to be developed and deployed. Some information may be public domain, and other information, such as the exact locations of historic shipwrecks, will be restricted by law to protect the resources. Levels of access to the data will be determined through agreements with partners. Educational materials that interpret the data and make the information accessible and understandable to a wider audience will also be developed and deployed.

Activity IM-2.1: Design tools for accessing the PIMS.

Using the latest technologies, the MMB will develop tools for accessing, updating, analyzing, and retrieving PIMS data. Access tools will be primarily web-based. These tools will allow for integration into GIS, on-line analytical processing via open database connectivity, object linking and embedding, and synchronization with analogous database management system resources.

Tools will include integrated biogeographic and spatial analyses, maps, and reports that define the characterization of the ecosystem diversity, interaction, and health, and the effectiveness of past, current, and future management efforts.

Activity IM-2.2: Assess data access needs and provide training for PIMS users.

Assessing the uses of the PIMS will be an evolving process, and providing access will be tightly integrated with activity IM-2.1, above. Before any access is provided, rules and access restrictions will be determined to ensure security and confidentiality of the data. These restrictions will be established in coordination with data providers. A training program for management and other users of the PIMS will be developed so that access and use are facilitated.

Activity IM-2.3: Develop interfaces to feed data to repositories such as National Biological Information Infrastructure, Pacific Basin Information Node, Coral Reef Information System, and Integrated Ocean Observing System.

The MMB will maintain standardized metadata records for data indexed within the PIMS to help facilitate the population of other data repositories with NWHI data. To automate this process, agreements and data streaming and sharing mechanisms will need to be developed.

Table 3.6.2 Summary of Strategies, Activities, and Agency Leads for Information Management

Strategies and Activities	Agency Lead
Strategy IM-1: Within 5 years, develop and implement a system for handling Monument data.	
Activity IM-1.1: Develop and implement a data discovery, inventory, and acquisition strategy.	NOAA
Activity IM-1.2: Develop appropriate data management protocols, procedures, and agreements with partner agencies.	NOAA
Activity IM-1.3: Continue to design, build, and maintain the Papahānaumokuākea Information Management System.	NOAA
Activity IM-1.4: Begin incorporating information into PIMS.	NOAA
Strategy IM-2: Within 5 years, facilitate appropriate access and use of PIMS.	
Activity IM-2.1: Design tools for accessing the PIMS.	NOAA
Activity IM-2.2: Assess data access needs and provide training for PIMS users.	NOAA
Activity IM-2.3: Develop interfaces to feed data to repositories such as National Biological Information Infrastructure, Pacific Basin Information Node, Coral Reef Information System, and Integrated Ocean Observing System.	NOAA

3.6.3 Coordinated Field Operations Action Plan

Desired Outcome

Coordinate field activities and provide adequate infrastructure to ensure safe and efficient operations while avoiding impacts to the ecosystems in Papahānaumokuākea Marine National Monument.

Links to other Action Plans
 All Action Plans are related to carrying out field operations

Current Status and Background

Field operations in the Monument to support protection and management rely on ships, aircraft, seasonal field camps, and three field stations with varying degrees of infrastructure. Interagency planning and sharing of resources for fieldwork began with the Tripartite Commission’s work in the late 1970s (Tripartite Agreement 1978). Recent field activities in the NWHI continue this cooperative work through a number of projects. One of the most significant of these is the annual NWHI Reef Assessment and Monitoring Program (RAMP) research and outreach expeditions. These expeditions are made possible through sharing of both vessels and dive teams.

Links to goals
 Goal 1
 Goal 2
 Goal 3
 Goal 4
 Goal 7
 Goal 8

Two NOAA ships service the majority of ship based management needs in the Monument. The NOAA Ship *Oscar Elton Sette* first arrived in Hawai‘i in 2003 primarily to support the scientific missions of NMFS, Pacific Islands Fisheries Science Center in Honolulu. *Oscar Elton Sette* is a 224-foot T-AGOS-class research ship that is designed to conduct and facilitate research operations in remote areas. The ship normally operates throughout the central and western Pacific and conducts fisheries assessment surveys, physical and chemical oceanography, marine mammal projects, and coral reef research. The *Oscar Elton Sette* has participated in coordinated RAMP efforts since its arrival in 2003.

In September 2004, the NOAA ship *Hi‘ialakai* became the first oceanographic research platform primarily dedicated to the National Ocean Service.

Hi‘ialakai, the sister ship to the *Oscar Elton Sette*, is a 224-foot T-AGOS-class research ship that is designed to conduct and facilitate research operations in remote areas throughout the



NOAA Ship *Hi‘ialakai*. Photo: Dan Suthers

Pacific. The ship’s primary mission is to support the research, monitoring, assessment, restoration, and outreach needs of NOAA’s National Ocean Service in waters around the Hawaiian Islands and the American Flag Territories. Maintenance and operations of NOAA ships are managed by NOAA Marine and Aircraft Operations.

Several other vessels, such as the NOAA ships *Ka‘imimoana* and *Okeanos Explorer*, the

University of Hawai‘i’s R/V *Kilo Moana* and R/V *Kaimikai-O-Kanaloa*, Coast Guard vessels, and chartered vessels, are engaged in mapping, deep-water benthic characterization, marine debris removal, protected species recovery activities, management-oriented research, and resupply missions to FWS and state land-based operations throughout the Monument. Collectively, these ships conduct approximately 10 to 12 missions per year during the months of April through November. Much of the field work conducted in the Monument is supported by NOAA ships.

FWS maintains permanent staff and infrastructure at Tern Island (French Frigate Shoals) and Midway Atoll, as well as a year-round FWS field camp at Laysan Island. The State maintains facilities at Kure Atoll, which are staffed for much of the year. Seasonal field camps are located at Nihoa, Lisianski Island, and Pearl and Hermes Atoll.

Midway Atoll NWR includes facilities and infrastructure left by the military when the Naval Air Facility closed. It includes 237 real property assets, including a Federal Aviation Administration (FAA)-approved commercial airport, numerous buildings, airplane hangars, roads, utilities, docks, seawalls, shipping channel, in addition to structures eligible for listing on the National Register of Historic Places. The infrastructure at Midway supports refuge management operations, airport operations, and a limited number of partners and visitors. The FWS and FAA have partnered together to manage Henderson Airfield and maintain Midway Atoll’s aging infrastructure. Over the past 6 years, FWS has been upgrading and rightsizing Midway’s operating systems, and FAA has constructed a new airfield operations building and provided funding for other airfield improvements.

By utilizing the existing World War II and Cold War era buildings, FWS managers are able to preserve the history of the atoll, provide support to the many ongoing management and research projects, and focus on protecting the islands and surrounding reefs for the benefit of the unique mix of species that live at Midway Atoll. In order to effectively plan for future Monument operations at Midway, the Midway Atoll Conceptual Site Plan was drafted. The Conceptual Site Plan (Volume IV) outlines the vision and practical realities of future uses and provides an overarching view of priority actions. Field infrastructure requirements for education, research, restoration, and management programs were identified by the MMB in a requirements planning process carried out in 2007.

Tern Island is the support hub for management operations at French Frigate Shoals. The facilities consist of 42 real property assets that remain from prior Coast Guard use. These facilities include shore protections, two septic tanks, a small barracks that serves as a residential and office facility, a single warehouse, several small storage and utility buildings, water catchment systems, a 3,000-foot crushed coral runway, a shipping channel, and a small boat ramp and dock. All of the Tern Island real property assets are utilized by and support MMB agencies and are maintained by FWS.

Laysan Island is a temporary year-round field camp that supports management of the island. The facility consists of seven temporary wood-framed platform tents used for sleeping, offices, communications, cooking, and storage. To support this field camp, a reverse osmosis water

system, a photovoltaic power system, and a hurricane shelter for high wind and surf emergencies are maintained. Laysan Island is currently accessible only by ship.

Green Island serves as the hub for the State of Hawai'i's Seabird Sanctuary at Kure Atoll. The facilities consist of storage buildings, a four room residential and office building, water tank, septic tank, a nonoperational coral runway, and a small boat pier. The assets on Green Island are maintained by the State.

Past coordination efforts

In the past, NOAA has hosted an annual NWHI field calendar meeting to facilitate overall field coordination among the Co-Trustees. The goal of this type of meeting was to create a master calendar of all field operations, scheduled flights, cruise plans, field camps, and similar activities. These meetings were open to managers, scientists, and staff from all agencies and groups conducting research or field activities in the NWHI. Attendees provided dates, places, and other logistical details of planned fieldwork to the calendar. Field activities typically included NOAA research vessel cruises, scheduled FWS charter flights to Midway and Tern Island, marine debris cleanup activities, ship charters to support FWS field stations, and special field activities such as *Hōkūle'a* voyages. The purpose of the common calendar was to increase coordination, efficiency, and safety for all NWHI fieldwork.

Impacts of field work

Well-planned field activities benefit wildlife habitats and historic and cultural resource protection, and are designed to minimize negative impacts to ecosystems, avoid redundant efforts, and achieve efficient use of agency resources. Each year, coordinated planning benefits management activities such as the multiagency-supported effort to remove derelict fishing gear from the reefs and beaches; implementation of endangered plant, monk seal, sea turtle, and bird recovery actions; management and restoration of marine and terrestrial species and their habitats; and conducting management-oriented research. This emphasis on coordinated planning and the application of consistent interagency permit requirements will prevent or minimize potential impacts that could be associated with these types of activities.

Diving Protocols

Standardization of safety training and diving protocols among different agencies has proved difficult in the past. MMB agencies have established interagency reciprocity agreements for diving protocols and with affiliated institutions of the American Academy of Underwater Sciences. These agreements are renewed and updated as necessary.

Need for Action

Appropriate vessels, aircraft, facilities, equipment, and training are critical to carrying out field operations in a safe and effective manner. Coordinating these assets among Co-Trustees is central to achieving the goals of the Monument. Field coordination among the MMB and the ICC provides for efficient use of public funds, increased availability of assets, reduced duplication of effort, and minimized impacts to Monument resources. Because of the remote nature of the region and limited availability of facilities, coordination is essential to the success of activities such as emergency response, wildlife and habitat management, law enforcement, research, as well as marine debris removal and other threat reduction tasks.

This plan provides strategies and activities for coordinating the implementation of low-impact field operations by ensuring that necessary facilities, equipment, and transportation are available and that staff is properly trained (see Section 3.3.4, Emergency Response and Damage Assessment Action Plan). One of the important principles in all of these strategies and activities is to use the latest “greening” methodologies and technologies in future operations and infrastructure improvement projects at Midway and all other field sites, including NOAA ships. As required, facilities and other infrastructure will be ADA compliant.

Strategies to Achieve the Desired Outcome

Nine strategies have been identified for achieving the desired outcome of coordinating field activities and providing adequate infrastructure to ensure safety and efficient operations while avoiding impacts to ecosystems in the Monument. The strategies and activities are coded by the acronym for the action plan title, “Coordinated Field Operations” (CFO). A summary of strategies and activities is provided in Table 3.6.3 at the end of this action plan.

- CFO-1: Conduct necessary site planning and infrastructure improvements to increase safety and enhance Monument field operations capacity over the life of the plan.
- CFO-2: Enhance interagency planning and coordination for field operations in support of Monument protection and management, and develop protocols and processes that will be utilized throughout the life of the plan.
- CFO-3: Maintain and improve housing and field camp safety and operational efficiency using short-, medium- and long-term approaches to protect Monument resources across the life of the plan.
- CFO-4: Meet fuel requirements for aircraft, vessel, utility, and equipment needs at Midway Atoll to support operations to protect and manage Monument resources.
- CFO-5: Rehabilitate critical utility systems and ailing structures and facilities at Midway Atoll within 5 to 15 years.
- CFO-6: Within 5 years, improve the small boat operational capacity to enable quick, reliable access to the region in support of protection and management and continue to enhance the program throughout the life of the plan.
- CFO-7: Within 5 years, identify interisland aircraft transportation needed to protect and manage the Monument.
- CFO-8: Develop a safe and comprehensive dive operations program for Monument management activities within 5 years.
- CFO-9: Provide for necessary research, education, visitor, and administrative facilities that will further the protection of Monument resources across the life of the plan.

Strategy CFO-1: Conduct necessary site planning and infrastructure improvements to increase safety and enhance Monument field operations capacity over the life of the plan.

In-depth site planning and analyses are needed to ensure that field operations align with the purpose and mission of the Monument, as well as the purposes of the Midway Atoll and Hawaiian Islands National Wildlife Refuges, NWHI Coral Reef Ecosystem Reserve, the State of Hawai‘i NWHI Marine Refuge, and the Seabird Sanctuary at Kure Atoll. This effort will help

meet the shared responsibilities for management, emergency response, enforcement, education, recreation, and research in the Monument.

Activity CFO-1.1: Initiate and complete necessary planning to implement the Midway Atoll Conceptual Site Plan.

Substantial time and resources are required for infrastructure rehabilitation, reconstruction, and development included in the Midway Atoll Conceptual Site Plan (Volume IV). Priority actions for Midway have been identified in Chapter 6 of the Midway Atoll Conceptual Site Plan and are included in this action plan. Several of these actions are projected for completion in the short term, while others will require additional planning and environmental analysis and are anticipated to take place over the life of the plan.

Activity CFO-1.2: Develop conceptual site plans for Hawaiian Islands National Wildlife Refuge and Seabird Sanctuary at Kure Atoll to enhance management and restoration capabilities.

Individual conceptual site plans will be developed for the Hawaiian Islands NWR and the State Seabird Sanctuary at Kure Atoll to identify long-term infrastructure alternatives and priorities. These plans will be based on the identification of field requirements developed by the MMB in 2007 and will assess the opportunity for education, research, habitat restoration, and management programs. It is anticipated that these plans will be developed within 3 years.

Activity CFO-1.3: Develop alternative energy system and waste reduction strategies for the Monument within 2 years.

In accordance with agency building standards, the strategy will consider solar and other renewable energy generation, integration of kitchen waste with biodiesel or other sustainable fuel types use in machinery, composting of food waste, growing produce on site (at Midway only), passive lighting and cooling, and replacing aging infrastructure using sustainable nontoxic building materials. Each building will be evaluated to determine the feasibility of generating its own power. In the interim period, proven energy efficiencies will be implemented.

Activity CFO-1.4: Plan for use of sustainable engineering, technology, and landscape architecture for facilities and assets throughout the Monument.

In support of the “Greening of America” government-wide initiative, the managing agencies will apply feasible “greening” methodologies and technologies to future operations and infrastructure improvement projects at Midway and all other field sites, including NOAA ships. Greening will also be applied to alternative transportation options and opportunities, particularly at Midway. These green principles will be applied to the operation of vehicles at Midway, small boats, selection of nontoxic lubricants and maintenance materials, and development of fuel capacity.

Strategy CFO-2: Enhance interagency planning and coordination for field operations in support of Monument protection and management, and develop protocols and processes that will be utilized throughout the life of the plan.

One of the Monument’s operating principles is to use effective planning and communication to coordinate activities in order to minimize resource impacts, avoid redundant or duplicative efforts, and achieve efficient use of agency resources in the implementation of priority

management needs. The MMB will work with partners in planning field operations for these purposes and to contribute to the success of each project. Ship scheduling, coordination of logistical support, and interagency collaboration are elements of field operations that will be addressed in advance of each field season.

Activity CFO-2.1: Develop interagency agreements to facilitate effective field coordination throughout the Monument.

Interagency agreements to coordinate field operations, share resources, and commit to joint implementation of field priorities will be developed as appropriate. Agreements will be considered among the Co-Trustee agencies and the Interagency Coordinating Committee, as appropriate. (See Section 3.5.1, Agency Coordination Action Plan)

Activity CFO-2.2: Develop and implement standardized field operation protocols.

Environmental, safety, and preparedness protocols for field operations consistent with partner agency standards will be developed to provide resource protection and safe field operations. A field operations manual will be prepared and updated as needed that includes these protocols, as well as protocols and chain of command procedures for reporting environmental and safety incidents, personnel communication, and evacuations. All principal investigators and managers working in the NWHI will receive a copy of the field operations manual.

Activity CFO-2.3: Assess threats that field activities pose to Monument resources.

Permitted activities will be monitored through field activity reports to assess the threats they may pose to the resources. Reporting requirements will be developed with partners that will draw on existing databases when available. Any incidents will be tracked to assess potential damages to resources. Data will be managed in PIMS to provide for adaptive management by the MMB in conducting or authorizing future field activities (see the Information Management Action Plan, Section 3.6.2).

Activity CFO-2.4: Annually coordinate field operations to efficiently deploy personnel and share resources among agency partners.

The MMB will create an annual NWHI master field calendar of all field operations, scheduled flights, cruise plans, field camps, and similar activities. Agency partners will contribute information on dates and locations of research, management, and field activities in the NWHI. The common field calendar will be developed to ensure that the highest priority management needs are met as efficiently and economically as possible, and with the highest possible level of safety.

Activity CFO-2.5: Develop a staff coordination agreement between Midway Atoll NWR and the State Seabird Sanctuary at Kure Atoll.

To assist in island management activities, occasional site “exchange” visits will be conducted between the State and FWS staff at Midway and Kure Atolls. These visits will ensure that habitat restoration and management activities and wildlife monitoring activities are coordinated between FWS and the State.

Strategy CFO-3: Maintain and improve housing and field camp safety and operational efficiency using short-, medium-, and long-term approaches to protect Monument resources across the life of the plan.

There is a critical need to plan and design facilities at various field sites to ensure that activities can be accomplished without impairing the ecosystem. Some of the field sites within the Monument include existing buildings, roads, airstrips, and other structures. Many of these buildings are important for management of the Monument. Others will be removed as they outlast their useful life. As structures are re-used and others removed, we expect a net decrease in the number of facilities within the Monument. The needs of resources, visitors, staff, volunteers, contractors, researchers, and educators will be considered, as well as temporary accommodations in case of emergency aircraft landings, ship evacuations, or emergency response events. As stated in Activity CFO-1.4, the MMB will apply all feasible green engineering methods and technologies to all future projects.

Activity CFO-3.1: Design and construct a pilot low-impact shelter.

A low-impact shelter will be built on the footprint of a previously existing building, as a pilot project in the housing zone on Midway Atoll within 4 years in accordance with the Midway Atoll Conceptual Site Plan. This pilot project will serve to gauge the feasibility of using this type of structure on Midway. These structures may be used to replace aging, energy-inefficient buildings and will be designed to optimize renewable energy resources. The buildings will incorporate recycled materials, will be nonpolluting, and may potentially increase the available wildlife habitat. The buildings will serve as lodging for short-term and transient visitors.

Activity CFO-3.2: Utilize the existing footprint of Bravo Barracks for replacement housing at Midway Atoll.

Bravo Barracks houses permanent operations and maintenance personnel, but the end of its current useful life is within 3 years. The barracks are in critical need of demolition and replacement or major repair. Replacement or improvement is essential in order to provide safe housing for personnel to sustain island operations. The replacement building will be designed to optimize renewable energy resources and improve wildlife habitat.

Activity CFO-3.3: Utilize the existing footprint of Charlie Barracks for replacement housing at Midway Atoll.

Charlie Barracks replacement or major repair is essential in order to provide safe housing for island visitors and transient personnel. Such improvement is envisioned to take place within 10 years and will follow the low-impact guidelines.

Activity CFO-3.4: Rehabilitate “Officers’ Row” Housing at Midway Atoll.

The ten historic Officers’ Row houses, present during the Battle of Midway, serve as examples of historic Albert Kahn architecture and are identified for restoration in the draft Midway Atoll Conceptual Site Plan. Optimizing the housing capacity within these existing structures will accommodate increased agency and partner personnel without adding structures to the island. The rehabilitation of these structures would take place within 10 years.

Activity CFO-3.5: Maintain and enhance, where appropriate, the infrastructure at Kure Atoll.

Well-established, permanent biological monitoring and restoration programs at Kure Atoll are dependent on existing housing and facilities on Green Island at Kure Atoll. Given the harsh environmental conditions that exist, there is an ongoing need to maintain, improve, or replace communications equipment, solar power and water production units, sewage treatment infrastructure, buildings, and equipment. All field operations requirements at Kure Atoll will be assessed in accordance with Activity CFO-1.2.

Activity CFO-3.6: Maintain and enhance, where appropriate, the infrastructure at French Frigate Shoals.

A permanent biological field station exists on Tern Island at French Frigate Shoals. The biological monitoring programs that operate from the island are dependent on existing housing, warehouses, small boat facilities, and a short coral rubble air strip. Given the harsh environmental conditions, there is an ongoing need to maintain, improve or replace communications equipment, solar power and water production units, buildings, and equipment. For example, the barracks roof requires replacement by 2012. All field operations requirements at French Frigate Shoals will be assessed in accordance with Activity CFO-1.2.

Activity CFO-3.7: Evaluate, maintain, and enhance the small tent field camp at Pearl and Hermes Atoll on Southeast Island.

A seasonal three-person tent field camp is currently maintained at Pearl and Hermes Atoll to support the long-term Hawaiian monk seal population monitoring and recovery effort. Periodic overwashing of the islands by storm surges will require tent platforms to be built as soon as possible to provide for personnel safety and to minimize resource impacts. A year-round small tent camp is also needed to improve habitat by supporting invasive plant species eradication. The establishment of a permanent field camp in addition to upgrading the existing seasonal camp will be evaluated in accordance with Activity CFO-1.2.

Activity CFO-3.8: Maintain and enhance the existing tent field camp at Laysan Island to support on the ground management and restoration capacity.

An intensive alien species eradication and native habitat restoration program is currently under way at Laysan Island. A year-round presence of staff on island is necessary. Staff reside in a minimal tent camp, which requires routine maintenance and replacement of solar power, water purification, and communications equipment, as well as periodic replacement of tents and other structures.

Strategy CFO-4: Meet fuel requirements for aircraft, vessel, utility, and equipment needs at Midway Atoll to support operations to protect and manage Monument resources.

The current fuel capacity at Midway Atoll was designed to meet the requirements of the FWS, FAA, and the Coast Guard. This capacity includes fuel for island power supply, aircraft, and heavy equipment and a limited amount of gasoline for small boats and vehicles. Additional Co-Trustee fuel requirements will be met by adding storage capacity, using biodiesel or other sustainable fuel types, and improving fuel efficiency in all of Midway's operations.

Activity CFO-4.1: Maintain recently replaced fuel farm at Midway Atoll.

The Midway Atoll fuel farm is designed to meet current FWS, FAA, and Coast Guard needs. In the short term, a Memorandum of Agreement will be drafted describing how the MMB agencies can share and replenish existing supplies, while increasing the capacity of gasoline, biodiesel, or other sustainable fuel types. The MMB will convert existing and new small boats, vehicles, heavy equipment, and generators to more fuel-efficient models using other sustainable fuel types where feasible.

Activity CFO-4.2: Develop biodiesel fuel capacity or other sustainable fuel types at Midway Atoll within 2 years.

The MMB will work toward converting existing and new small boats, vehicles, and heavy equipment to the use of biodiesel or other sustainable fuel types where feasible. Two locations will be evaluated for storage and distribution of this type of fuel. The first is located on the concrete pad adjacent to the north seawall on the inner harbor of the atoll. This location has the advantage of being close to future small boat piers, which would allow for simple and safe fueling procedures. However, this would require regular supervision of this fuel supply in addition to that required at the fuel farm. Alternatively, the fuel could be stored at the existing fuel farm location, but this option would necessitate a fueling truck or the use of boat trailers to complete fueling operations.

Strategy CFO-5: Rehabilitate critical utility systems and ailing structures and facilities at Midway Atoll within 5 to 15 years.

A number of centralized systems, such as water and sewage, and a number of facilities and buildings are utilized by personnel throughout the Monument. Critical infrastructure is also the backbone of all operations that support Midway's conservation and management purpose. Without substantial investment in the rehabilitation and repair of these resources, operations would be seriously impaired. System needs have been identified through the draft Midway Atoll Conceptual Site Plan and will continue to be evaluated to reduce reliance on centralized utilities. All rehabilitation and repair work will follow low-impact guidelines. Additional needs for other islands and atolls throughout the Monument will be developed in the future, as cited in Activity CFO-1.2.

Activity CFO-5.1: Rehabilitate water catchment and distribution system.

Within 5 years, the water catchment and distribution system will be rehabilitated in order to adequately supply existing needs and those envisioned in the draft Midway Atoll Conceptual Site Plan.

Activity CFO-5.2: Rehabilitate septic and wastewater systems.

Reliable septic and wastewater systems will be required to support existing and additional needs envisioned in the draft Midway Conceptual Site Plan. The rehabilitation of these systems will take place within 5 years.

Activity CFO-5.3: Treat all wooden historic structures at Midway Atoll for termites.

All wooden historic structures must be treated for termites within 3 to 5 years in order to maintain the structural integrity of the buildings. Without treatment, the buildings will deteriorate beyond repair.

Activity CFO-5.4: Evaluate and optimize food services as necessary.

The Clipper House currently serves as the primary food service facility at Midway. Overall food services will need to be optimized to accommodate population needs.

Activity CFO-5.5: Rehabilitate seaplane hangar.

Because of its size (large enough to hold heavy equipment, boats, and workshops), its location (short distance from inner harbor and boat ramp), and its historic significance (designed by Albert Kahn and still contains scars from the Battle of Midway), the seaplane hangar needs to be maintained. A priority is to replace the roof of the building.

Activity CFO-5.6: Repair inner harbor sea wall.

The inner harbor is critical to operations at Midway. Any future docking and pier facilities in the harbor must be preceded by the repair of the existing seawall within 15 years.

Strategy CFO-6: Within 5 years, improve the small boat operational capacity to enable quick, reliable access to the region in support of protection and management and continue to enhance the program throughout the life of the plan.

Improved access to the islands and atolls of the NWHI has been identified as a top priority. Small boat support is a key component to reliable access between islands and around individual island reef systems. Small boat capacity is instrumental to research, conservation, enforcement, outreach, education, and emergency response throughout the archipelago.

Activity CFO-6.1: Inventory, maintain, and coordinate the use of small boats and related field resources.

The Co-Trustees have a variety of small boats and related field resources that are used for fieldwork within the Monument. An inventory of small boats and support equipment will be conducted Monument-wide to determine whether these resources can be used more effectively by the Co-Trustees and to reduce duplicative efforts.

Activity CFO-6.2: Within 2 years, station additional vessels at Midway for use during the summer marine research field season.

New vessels will be used to support existing field activities at Midway Atoll and to establish an annual research and monitoring program for marine debris, maritime heritage, and coral reef communities. These vessels will expand the range of operations both inside and outside the lagoon as well as to neighboring islands and atolls on a limited basis.

Activity CFO-6.3: Within 5 to 10 years, station a small research/enforcement vessel at Midway Atoll.

A small research/enforcement vessel would expand research, enforcement, education, response, and restoration capabilities from French Frigate Shoals to Kure Atoll. Repair and maintenance facilities will be improved at Midway, and full-time support personnel will be identified to properly manage this asset. This vessel will be permanently based at Midway, but could also be based out of the main Hawaiian Islands for part of the year to service the southeastern portions of

the Monument. This vessel will provide the opportunity to dedicate short cruises to individual projects on a regular basis.

Activity CFO-6.4: Construct new finger piers inside of Midway's inner harbor.

To meet the small boat needs, within 5 years evaluate the structural integrity of the inner harbor seawall, make appropriate improvements, and construct up to three finger piers. These piers will be designed to simplify, and increase the safety, of fueling and loading as well as to provide short-term in-water storage for a variety of small boats. Any new piers will follow the low-impact guidelines. Midway's inner harbor is not fully protected from outside sea conditions, and additional piers will allow for sheltered small boat storage under a variety of conditions.

Activity CFO-6.5: Redevelop existing boathouse at Midway into a multiuse facility. Consistent with the priorities contained within the Midway Atoll Conceptual Site Plan, redevelop the existing boathouse at Midway into a multipurpose boathouse, dive center, and storage facility. The facility will have maintenance bays for servicing small boats and a dive locker, including a compressor, recompression chamber, appropriate storage, and work area. The facility may also include temporary, short-term bunk space and limited, interim lab space until other facilities were renovated and reconstructed to meet these needs. The building will be re-sited and potentially raised to address concerns over flooding on the seaplane pad, and to minimize resource impacts. Small boat operations depend on a reliable means of removing the boats from the water. At present, the seaplane ramp that is used is not sufficiently steep and results in inadvisable launch and recovery methods. A new boat ramp will be constructed to address this concern, while renovating the adjacent small boat pier.

Activity CFO-6.6: Evaluate needed improvements to Pier No. 1 in the ship basin and the Tug Pier at Midway Atoll.

In order to ensure access for large vessels such as NOAA, Coast Guard, and university research vessels, Pier No. 1 and the Tug Pier will be evaluated for needed renovations and maintenance. The ability for ships to dock at Midway, in conjunction with reliable air transport, will assist in efficient research operations and crew changes on cruises, while also providing an additional place for supply ships and other vessels to dock. All pier renovations will follow the low-impact guidelines.

Activity CFO-6.7: Make needed improvements to or replace the pier at Eastern Island.

Eastern Island pier renovation is required to ensure continued access for researchers and field workers. Attention is required as soon as feasible to prevent damage to boats and improve passenger safety. Eastern Island pier renovations will follow the low-impact guidelines.

Strategy CFO-7: Within 5 years, identify interisland aircraft transportation needed to protect and manage the Monument.

The small number of regularly scheduled flights to and from the Monument is a limiting factor to the expansion of a visitor services program and science station at Midway Atoll, and a host of management, research, educational activities, and enforcement and emergency response throughout the Monument. Frequent and reliable access in support of these activities is needed. Regular flights are currently contracted and managed by the FWS. Additional flights are

currently booked by individual entities on an as-needed basis, which contributes to their high costs. The following activities will be conducted to ensure that Monument aircraft needs are considered and met.

Activity CFO-7.1: Identify a reliable, efficient, cost-effective aircraft service to improve the delivery capacity of personnel and cargo between Honolulu and Midway.

Without reliable air transport, the vast majority of current operations at Midway, as well as many operations in the other islands of the NWHI, would cease to exist. Air transport maintains the link between Midway and Honolulu and allows Midway to serve as the logistical hub for the northern end of the archipelago. Air transport is currently limited by the small cargo and personnel capacity of the aircraft being used. Identifying a more capable aircraft service is key to optimizing the operations on Midway and other areas within the Monument.

Activity CFO-7.2: Within 5 to 10 years, evaluate the need for a dedicated aircraft for transportation, research, evacuation, education, surveillance, management, and enforcement in the Pacific region.

A shared aircraft that would be used across the Pacific region, throughout the year or seasonally, may be an effective way to defray the high costs of air transportation. Maintenance facilities and staffing would need to be considered if such a craft were acquired. The need for a dedicated aircraft will be evaluated within 5 to 10 years.

Activity CFO-7.3: Within 15 years, acquire appropriate aircraft to service the Monument and the Pacific region.

Pending the outcome of the evaluation (Activity CFO-7.2), an appropriate aircraft or use of multiple platforms will be acquired as necessary to meet the needs of the Monument and region.

Strategy CFO-8: Develop a safe and comprehensive dive operations program for Monument management activities within 5 years.

Coordinated dive operations are critical to effectively and safely carrying out marine research, monitoring, emergency response, and management activities. Such a program will require infrastructure and equipment investments, training, interagency communication and agreements, and compliance with all agency requirements.

Activity CFO-8.1: Refurbish or replace the dive recompression chamber at Midway.

A dive recompression chamber was installed and refurbished on Midway in the late 1990s in support of commercial dive tour operations and research. The chamber has not been serviced in more than 5 years and needs to be assessed and refurbished or replaced. This chamber would be maintained by an on-site chamber operator or dive technician.

Activity CFO-8.2: Investigate acquisition of a portable dive recompression chamber for use on a small research vessel.

A small, portable recompression chamber aboard the small research vessel referenced in CFO-6.3 would vastly extend the SCUBA-based research capacity of scientists in the remote NWHI. This equipment would be based at Midway and maintained by an on-site chamber operator or dive technician.

Activity CFO-8.3: Incorporate a dive operations center into the refurbished boathouse facility at Midway.

Consistent with the draft Midway Atoll Conceptual Site Plan, the boathouse facility on Sand Island should be re-sited and refurbished to include a dive center complete with storage, maintenance facility, compressor, recompression chamber, and dive locker, as articulated in Activity CFO-6.5.

Activity CFO-8.4: Support interagency dive operations.

Agency dive supervisors will support interagency and contract field operations by maintaining updated reciprocity agreements, open communication among agency dive masters and chief scientists, and current records on agency and contract divers to ensure certifications and training requirements are current. Each agency is responsible for maintaining and ensuring the proficiency of its divers.

Strategy CFO-9: Provide for necessary research, education, visitor, and administrative facilities that will further the protection of Monument resources across the life of the plan.

A variety of infrastructure needs have been identified by the MMB and partner agencies for research, education, visitor interpretation, and administration to effectively meet the vision, mission, and goals of the Monument. Planning and appropriate redevelopment of existing buildings and limited construction of new low-impact facilities will take place according to the priorities identified in the draft Midway Atoll Conceptual Site Plan and the future Seabird Sanctuary at Kure Atoll and Hawaiian Islands National Wildlife Refuge conceptual site plans, as cited in Activity CFO-1.2.

Activity CFO-9.1: Design a marine laboratory at Midway and develop in phases.

A variety of needs will be met by the development of a marine laboratory at Midway. An evaluation and planning effort will help determine if the research and educational needs of potential users will be best met by developing several small facilities over time, or by a design that allows new requirements to be filled as they arise. Initially, the laboratory would provide basic amenities to augment research and education capacity including field schools, seasonal research, and long-term monitoring. A monk seal captive care facility (as outlined in Activity CFO-9.2), wet/dry laboratory infrastructure, and quarantine standards will be included in the plan and engineered as funding becomes available. Several existing buildings are well suited for conversion into a laboratory and will be evaluated to determine which is the most appropriate site.

Activity CFO-9.2: Complete planning for and construct a captive care monk seal facility on Sand Island.

A monk seal captive care facility at Midway Atoll has been identified as a critical component for survival of the species. Holding tanks, water treatment and pumping capability, freezer storage, and a dedicated food preparation area are required to be included in this facility, which will dramatically improve the effectiveness of rehabilitating ailing monk seals in the NWHI.

Activity CFO-9.3: Provide logistical, infrastructure, and transportation support for threatened and endangered species recovery actions.

Advanced recovery efforts, particularly efforts to address juvenile survival, will require logistical, infrastructure, and transportation capabilities that currently do not exist. For example, the ability to hold Hawaiian monk seals in a temporary facility, likely on Midway Atoll, is a critical component of these types of recovery actions. The ability to transport threatened and endangered species, equipment, and personnel among the various atolls is a challenge to animal relocation efforts, as is the capture and return of animals that may be brought into captivity for nutritional support or medical treatment.

Activity CFO-9.4: Complete Phase I rehabilitation of Midway Mall and the commissary building.

Collectively, the commissary building and the Midway Mall present ideal central locations for MMB and partner offices, classroom space, storage, visitor services, and basic laboratory space. Phase I rehabilitation of Midway Mall and the commissary will include cleaning and maintenance, renovation of office and classroom space and a feasibility study of how best to incorporate solar and other renewable energy, a green roof, and other sustainable design principles. The complete Midway Mall rehabilitation will require more substantial work and resources.

Activity CFO-9.5: Construct airport welcome center on Sand Island within 2 years.

A passenger terminal/welcome facility will be constructed at the airport to handle passenger arrival to and departures from Midway. This simple facility will offer restrooms, baggage handling, and a waiting area out of the weather. Design of the welcome center will follow the low-impact guidelines.

Table 3.6.3 Summary of Strategies, Activities, and Agency Leads for Coordinated Field Operations

Strategies and Activities	Agency Lead
Strategy CFO-1: Conduct necessary site planning and infrastructure improvements to increase safety and enhance Monument field operations capacity over the life of the plan.	
Activity CFO-1.1: Initiate and complete necessary planning to implement the Midway Atoll Conceptual Site Plan.	FWS
Activity CFO-1.2: Develop conceptual site plans for Hawaiian Islands National Wildlife Refuge and Seabird Sanctuary at Kure Atoll to enhance management and restoration capabilities.	State of Hawai'i FWS
Activity CFO-1.3: Develop alternative energy system and waste reduction strategies for the Monument within 2 years.	FWS
Activity CFO-1.4: Plan for use of sustainable engineering, technology, and landscape architecture for facilities and assets throughout the Monument.	FWS
Strategy CFO-2: Enhance interagency planning and coordination for field operations in support of Monument protection and management, and develop protocols and processes that will be utilized throughout the life of the plan.	
Activity CFO-2.1: Develop interagency agreements to facilitate effective field coordination throughout the Monument.	NOAA
Activity CFO-2.2: Develop and implement standardized field operation protocols.	FWS
Activity CFO-2.3: Assess threats that field activities pose to Monument resources.	NOAA
Activity CFO-2.4: Annually coordinate field operations to efficiently deploy personnel and share resources among agency partners.	NOAA
Activity CFO-2.5: Develop a staff coordination agreement between Midway Atoll NWR and the State Seabird Sanctuary at Kure Atoll.	State of Hawai'i
Strategy CFO-3: Maintain and improve housing and field camp safety and operational efficiency using short-, medium- and long-term approaches to protect Monument resources across the life of the plan.	
Activity CFO-3.1: Design and construct a pilot low-impact shelter.	FWS
Activity CFO-3.2: Utilize the existing footprint of Bravo Barracks for replacement housing at Midway Atoll.	FWS
Activity CFO-3.3: Utilize the existing footprint of Charlie Barracks for replacement housing at Midway Atoll.	FWS
Activity CFO-3.4: Rehabilitate "Officers Row" Housing at Midway Atoll.	FWS
Activity CFO-3.5: Maintain and enhance, where appropriate, the infrastructure at Kure Atoll.	State of Hawai'i
Activity CFO-3.6: Maintain and enhance, where appropriate, the infrastructure at French Frigate Shoals.	FWS
Activity CFO-3.7: Evaluate, maintain, and enhance the small tent field camp at Pearl and Hermes Atoll on Southeast Island.	FWS
Activity CFO-3.8: Maintain and enhance the existing tent field camp at Laysan Island to support on the ground management and restoration capacity.	FWS

Strategies and Activities	Agency Lead
Strategy CFO-4: Meet fuel requirements for aircraft, vessel, utility, and equipment needs at Midway Atoll to support operations to protect and manage Monument resources.	
Activity CFO-4.1: Maintain recently replaced fuel farm at Midway Atoll.	FWS
Activity CFO-4.2: Develop biodiesel fuel capacity or other sustainable fuel types at Midway Atoll within 2 years.	NOAA FWS
Strategy CFO-5: Rehabilitate critical utility systems and ailing structures and facilities at Midway Atoll within 5 to 15 years.	
Activity CFO-5.1: Rehabilitate water catchment and distribution system.	FWS
Activity CFO-5.2: Rehabilitate septic and wastewater systems.	FWS
Activity CFO-5.3: Treat all wooden historic structures at Midway Atoll for termites.	FWS
Activity CFO-5.4: Evaluate and optimize food services as necessary.	FWS
Activity CFO-5.5: Rehabilitate seaplane hangar.	FWS
Activity CFO-5.6: Repair inner harbor sea wall.	FWS
Strategy CFO-6: Within 5 years, improve the small boat operational capacity to enable quick, reliable access to the region in support of protection and management and continue to enhance the program throughout the life of the plan.	
Activity CFO-6.1: Inventory, maintain, and coordinate the use of small boats and related field resources.	NOAA
Activity CFO-6.2: Within 2 years, station additional vessels at Midway for use during the summer marine research field season.	NOAA
Activity CFO-6.3: Within 5 to 10 years, station a small research/enforcement vessel at Midway Atoll.	NOAA
Activity CFO-6.4: Construct new finger piers inside of Midway's inner harbor.	FWS
Activity CFO-6.5: Redevelop existing boathouse at Midway into a multiuse facility.	FWS NOAA
Activity CFO-6.6: Evaluate needed improvements to Pier No. 1 in the ship basin and the Tug Pier at Midway Atoll.	FWS
Activity CFO-6.7: Make needed improvements to or replace the pier at Eastern Island.	FWS
Strategy CFO-7: Within 5 years identify interisland aircraft transportation needed to protect and manage the Monument.	
Activity CFO-7.1: Identify a reliable, efficient, cost-effective aircraft service to improve the delivery capacity of personnel and cargo between Honolulu and Midway.	FWS
Activity CFO-7.2: Within 5 to 10 years, evaluate the need for a dedicated aircraft for transportation, research, evacuation, education, surveillance, management, and enforcement in the Pacific region.	NOAA
Activity CFO-7.3: Within 15 years, acquire appropriate aircraft to service the Monument and the Pacific region.	NOAA
Strategy CFO-8: Develop a safe and comprehensive dive operations program for Monument management activities within 5 years.	
Activity CFO-8.1: Refurbish or replace the dive recompression chamber at Midway.	NOAA

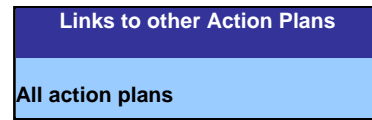
Strategies and Activities	Agency Lead
Activity CFO-8.2: Investigate acquisition of a portable dive recompression chamber for use on a small research vessel.	NOAA
Activity CFO-8.3: Incorporate a dive operations center into the refurbished boathouse facility at Midway.	FWS NOAA
Activity CFO-8.4: Support interagency dive operations.	NOAA State of Hawai‘i FWS OHA
Strategy CFO-9: Provide for necessary research, education, visitor and administrative facilities that will further the protection of Monument resources across the life of the plan.	
Activity CFO-9.1: Design a marine laboratory at Midway and develop in phases.	FWS NOAA
Activity CFO-9.2: Complete planning for and construct a captive care monk seal facility on Sand Island.	FWS NOAA
Activity CFO-9.3: Provide logistical, infrastructure, and transportation support for threatened and endangered species recovery actions.	NOAA
Activity CFO-9.4: Complete Phase I rehabilitation of Midway Mall and the commissary building.	FWS
Activity CFO-9.5: Construct airport welcome center on Sand Island within 2 years.	FWS

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3.6.4 Evaluation Action Plan

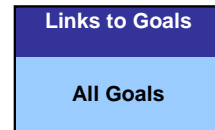
Desired Outcome

Determine the degree to which management actions are achieving the vision, mission and goals of Papahānaumokuākea Marine National Monument.



Current Status and Background

The Monument evaluation process is designed to meet specific site-level vision, mission, goals, and desired outcomes, as well as FWS', NOAA's, and the State of Hawai'i's overarching missions, goals, and priorities. The Government Performance and Results Act seeks to make the federal government more accountable to the American people for the tax dollars it spends and the results it achieves. NOAA and FWS view the use of performance measures for assessment and evaluation as critical to continued success.



Act 100, Session Laws of Hawaii, 1999, 'Relating to Government Operations' holds departments and agencies of the State of Hawai'i responsible for identifying their goals, objectives, and policies in order to provide a basis for determining priorities and allocating limited public funds and human resources. The State of Hawai'i DLNR approach in responding to these requirements was to develop an annual response that includes goals and objectives against which performance will be measured over the next one, two, and five years. This approach is designed to produce a more effective tool for measuring performance and will assist DLNR in establishing departmental priorities (DLNR Report to the Twenty-Fourth 2008 Legislature).

NOAA's strategic plan (2004a) and NOAA's National Ocean Service Strategic Plan (NOAA 2003a) outline four mission goals and six cross-cutting priorities. ONMS falls under the first mission goal:

Protect, restore, and manage the use of coastal and ocean resources through ecosystem-based management.

The ONMS also clearly supports five of the six cross-cutting priorities:

- Integrated global environmental observation and data management system
- Environmental literacy, outreach, and education
- Sound, reliable, state-of-the-art research
- International cooperation and collaboration
- Organizational excellence

The DOI is complying with the Government Performance and Results Act through its performance management system, which provides useful information to managers and promotes accountability for results. Specifically, FWS has adopted the following principles and priorities, which all apply to Monument management:

Conservation Principles:

- Science: Our work is grounded in thorough, objective science.

- Stewardship: Our ethic is to conserve natural resources for future generations.
- Service: It is our privilege to serve the American people.
- Professionalism: We hold ourselves to the highest ethical standards, strive for excellence, and respect others.
- Partnerships: We emphasize creative, innovative partnerships.
- People: Our employees are our most valued asset.
- Legacy: We ensure the future of natural resource conservation by connecting people with nature.

Priorities:

- National Wildlife Refuge System: Conserving our lands and resources.
- Landscape Conservation: Working with others.
- Migratory Birds: Conservation and management.
- Threatened and Endangered Species: Achieving recovery and preventing extinction.
- Aquatic Species: National Fish Habitat Initiative and trust species.
- Connecting People with Nature: Ensuring the future of conservation.

Given the similarity of NOAA and FWS priorities and the alignment of DLNR's Goals with the unifying Monument vision, mission, and goals, the Co-Trustees are committed to developing management plan performance measures to evaluate whether the strategies and activities contained in the action plans are achieving the goals and desired outcomes of the Monument. The management plan performance measures fall into three categories: annual benchmarking, management capacity assessment, and outcome assessment.

Annual benchmarking measures will be used to determine whether activities have occurred as planned. Management capacity assessment measures will be used every two to three years to determine the adequacy of implementation mechanisms and processes, including interagency coordination and stakeholder and community participation. Outcome assessment measures will be used every four to five years to evaluate the impacts of management actions on the resources and ecosystem status. These measures will be further defined through the process described in Activity EV-1.1, below.

Need for Action

One of the largest challenges in the management of ocean resources lies in knowing whether management actions are effective over time (Pomeroy 2004). Research and long-term monitoring programs are essential in an ecosystem-based management context, to provide reliable information and data to determine whether management actions are achieving desired outcomes. A second and equally important challenge is improving management based on reliable information and data, a sound governance process, and experience (Olsen et al. 1999).

Evaluation is needed to determine if management actions are achieving the desired outcomes, addressing priority management needs, and meeting the goals of the Monument. The outcomes of evaluation processes can then be used to improve processes, programs, and accountability; prioritize activities; and inform constituents.

The U.S. Commission on Ocean Policy recommends that national goals and guidelines be developed leading to a uniform process for effective design, implementation, and evaluation of marine protected areas. The President's Ocean Action Plan has elements addressing this issue. Since the Monument is the largest marine protected area in the United States, NOAA, FWS, and the State of Hawai'i are in a unique position to respond to these challenges and recommendations through a comprehensive evaluation process.

Strategies to Achieve the Desired Outcome

A meaningful evaluation requires the use of measurable strategies and the ability to monitor, evaluate, provide feedback, and then assess what is working and what needs to be changed in terms of desired outcomes, strategies, and activities. The strategy and activities are coded by the abbreviation for the action plan title, "Evaluation" (EV). A summary of strategies and activities is provided in Table 3.6.4 at the end of this action plan.

- EV-1: Implement a comprehensive evaluation process within 1 year.

Strategy EV-1: Implement a comprehensive evaluation process within 1 year.

Management plan measures will be used to determine the degree to which management actions achieve desired outcomes, address priority management needs, and meet the goals of the Monument. The use of site performance measures will ensure that potential changes are consistent with the Monument vision, mission, management principles, and goals.

Evaluation activities will be developed and implemented by the MMB. Evaluation reports will be prepared and reviewed by partner agencies and organizations for review and recommendations.

Activity EV-1.1: Prepare a comprehensive Monument evaluation strategy.

A comprehensive evaluation strategy will be designed to guide evaluation activities over a 5-year period. The strategy will describe information and data needs and methods to evaluate activity outputs and to quantify site measures. The output from this activity is a Monument evaluation strategy that describes site performance measures, their evaluation methods and timeframes, measurable elements, and roles and responsibilities of the Co-Trustees, partner agencies, and other organizations involved in the evaluation process.

Activity EV-1.2: Conduct annual program review.

Agency leads will be identified and responsible for developing milestones for each plan, tracking progress, and reporting to the MMB regarding milestones reached or interventions needed. The status of implementation of each action plan will be reviewed annually. MMB staff leads for each action plan will be responsible for determining the status of completion of planned activities and accomplishment of activity outputs. Data and information on site indicators will be compiled and analyzed in accordance with the timeframes described in the evaluation plan. The output of this activity is an annual report describing the status of activity implementation and recommended adjustments.

Activity EV-1.3: Conduct comprehensive evaluation and prepare a State of the Monument Report.

Every 5 years, a comprehensive evaluation will be conducted, considering the results of preceding annual reports and incorporating surveys, assessments, and long-term research and monitoring studies as described in the comprehensive evaluation plan (Activity EV-1.1). The comprehensive evaluation will describe the degree to which management actions have achieved desired outcomes, addressed priority management needs, and met goals for the Monument over the 5-year period. Status and trends of Monument resources, management issues, and ecosystem components will be described with recommendations for improved management actions. The output from this activity is a State of the Monument Report.

Activity EV-1.4: Conduct a management plan review.

As part of an adaptive management approach to ensure that Monument management is effective, the Monument Management Plan will undergo a review every 5-years. Scientific discoveries, identification of new sensitive or representative resilient areas for rezoning, advancements in managing marine resources and human dimensions approaches, and new resource management issues or approaches to issues will be updated over time.

The comprehensive evaluation and State of the Monument Report will serve as the primary input for the 5-year management plan review. Monument staff, together with partner agencies and organizations, will review past activities, revise strategies and activities accordingly and, as appropriate, add new strategies and activities based on priority management needs. The output of this activity will be a revised Monument Management Plan and revised regulations (as needed) for the next 5 years of operations, based on the review of recommended changes identified by the comprehensive evaluation.

Table 3.6.4 Summary of Strategies, Activities, and Agency Leads for Evaluation

Strategies and Activities	Agency Lead
Strategy EV-1: Implement a comprehensive evaluation process within 1 year.	
Activity EV-1.1: Prepare a comprehensive Monument evaluation strategy.	NOAA
Activity EV-1.2: Conduct annual program review.	NOAA
Activity EV-1.3: Conduct comprehensive evaluation and prepare a State of the Monument Report.	NOAA
Activity EV-1.4: Conduct a management plan review.	NOAA

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GLOSSARY
