

INTRA-AGENCY SECTION 7 BIOLOGICAL EVALUATION FORM
for
the Interim Visitor Services Plan for Midway Atoll National Wildlife Refuge,
Battle of Midway National Memorial,
and Midway Atoll Special Management Area

Notes:

- 1) Only terrestrial/seabird species will be evaluated in this document. Marine species (seals, turtles, whales) will be evaluated by the National Marine Fisheries Service in separate Interagency Section 7 Biological Evaluation.

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I. Region: 1 - Hawaiian and Pacific Islands National Wildlife Refuge Complex, Honolulu, Hawaii

II. U.S. Fish and Wildlife Service (Service) Activity:

The Service is proposing to implement an interim visitor services plan at Midway Atoll National Wildlife Refuge, Battle of Midway National Memorial, and Midway Atoll Special Management Area (Midway Atoll) to satisfy requirements of the National Wildlife Refuge System Improvement Act of 1997 and to allow the public the opportunity for education and interpretation of wildlife and historic resources and compatible wildlife-dependent recreation.

III. Species and Habitat:

- A. Listed species and/or their critical habitat within the action area, habitat, and occurrence:

1. **Short-tailed albatross (*Phoebastria albatrus*), endangered**

Short-tailed albatross are migratory, so they only occur/would occur at Midway Atoll from late October to early August to nest or to attempt to establish a pair bond. In 2003-2004 albatross breeding season, two, adult short-tailed albatross were observed at Midway Atoll, one on Sand Island near the Frigate Point end of the runway and one on Eastern Island on the northeastern end of the island (Fig. 1). One juvenile short-tailed albatross (nearly all dark feathers) was observed briefly (a few minutes) at Bulky Dump in January 2004 (Fig. 1). During the 2004-2005 and 2005-2006 breeding seasons, only one adult short-tailed albatross has been observed, the one on Eastern Island. In March 2006, one juvenile short-tailed albatross was observed at the southeastern end of the runway (Fig. 1). The last pair of short-tailed albatross to successfully fledge a chick at Midway Atoll was in 1962 on Sand Island near the runway, but the nesting area was paved over by the U.S. Navy in the subsequent year (USFWS unpub. data).

No critical habitat occurs for short-tailed albatross at Midway Atoll.

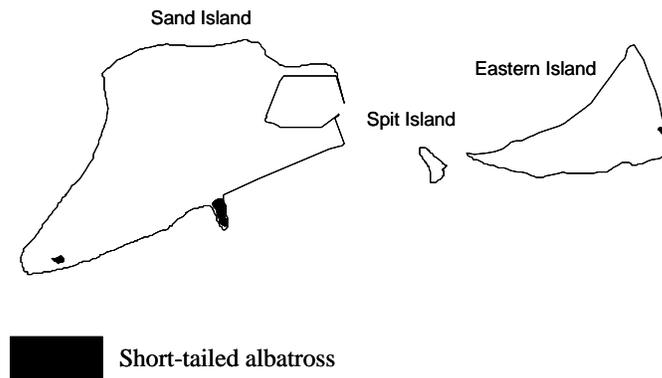


Figure 1. Distribution of short-tailed albatross at Midway Atoll.

2. Laysan duck (*Anas laysanensis*), endangered

In 2004, 20 endangered Laysan ducks were translocated to Midway Atoll from their only extant population on Laysan Island in the Hawaiian Islands National Wildlife Refuge. Biologists hope to establish a second “insurance” population of this endemic duck at Midway Atoll. The birds adapted well to Sand Island, and surprised biologists by breeding during their first year on Midway, with 12 ducklings successfully fledging. An additional 22 ducks were transported to Midway in 2005, most of which were introduced to Eastern Island. So far in 2006, 17 ducklings have fledged increasing the total population at Midway to 65 (Sand Island, 51; Eastern, 14). Laysan Ducks were originally released at the Aviary and Mauka Seeps on Sand Island and the Monument and Rolando Seeps on Eastern Island. Since their release the ducks have expanded their range on both islands (Fig. 2, 3).

Laysan ducks are year round residents at Midway Atoll. No critical habitat occurs at Midway Atoll.

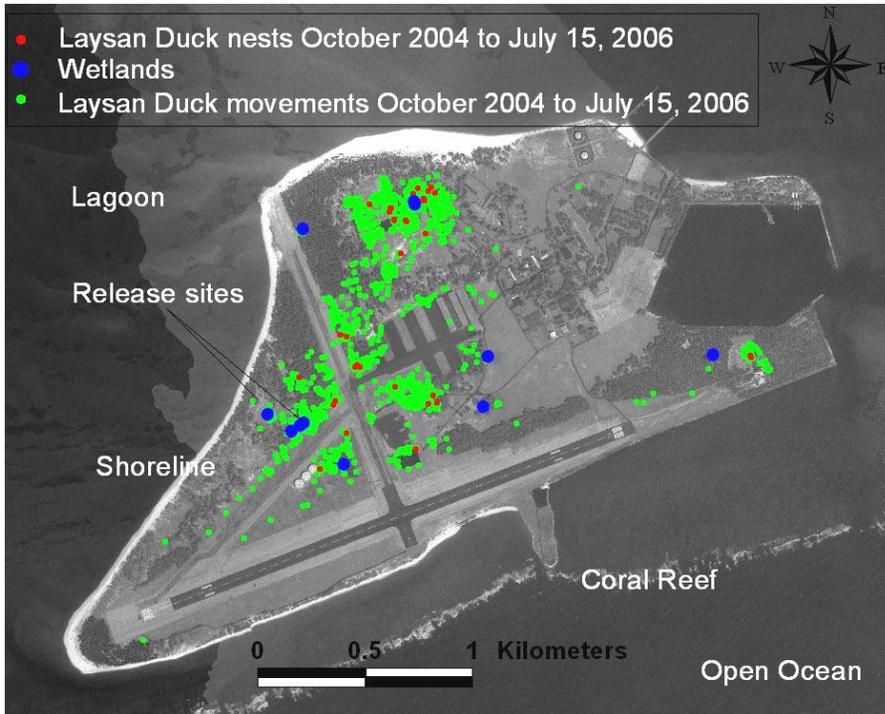


Figure 2. Laysan duck wetlands, release sites, movements, and nesting locations on Sand Island from October 2004 to July 2006.

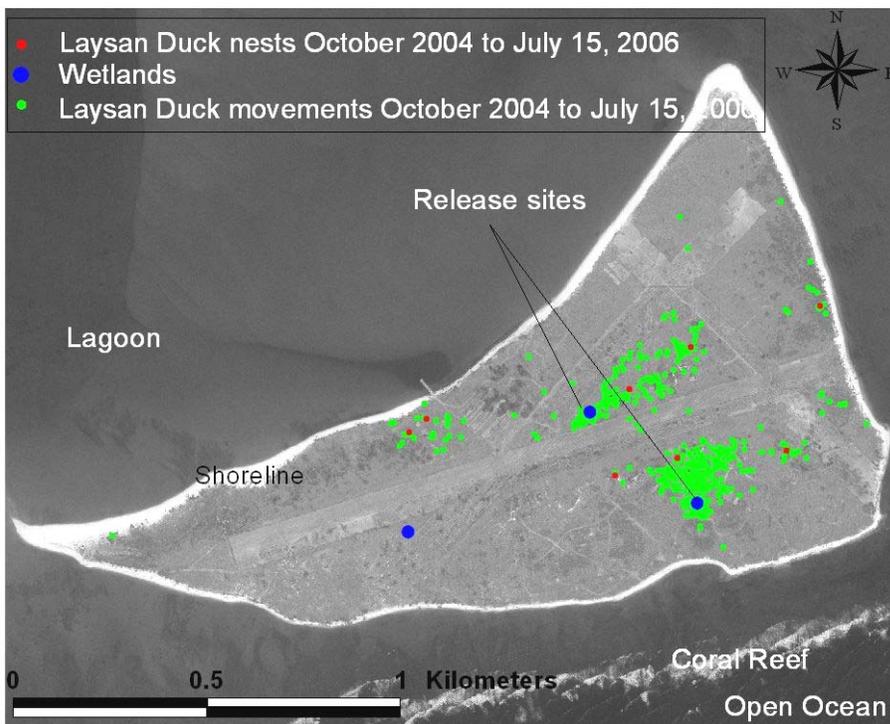


Figure 3. Laysan duck wetlands, release sites, movements, and nesting locations on Eastern Island from October 2004 to July 2006.

3. Green sea turtle (*Chelonia mydas*), threatened

Green sea turtles occur at Midway Atoll. They are seen in the waters of the lagoon, along certain shorelines, in and around surrounding coral reefs, and in deeper pelagic waters. No turtle nesting had been documented until successfully hatched eggs were discovered on Spit Islet in July 2006 (Service unpub. data). High surf uncovered the eggs which probably hatched the previous year. The highest concentration of basking green sea turtles occurs on 200-m section of beach on Sand Island called "Turtle Beach". The maximum number of turtles observed at one time was 28 (J. Klavitter, Service, pers. obs.).

4. *Cenchrus agriminoides* var. *laysanensis*, endangered plant

Cenchrus agriminoides var. *laysanensis* was originally found at Midway Atoll, although it has not been observed at Midway in recent times (Starr and Martz 1999). Scarce information exists for this species at Midway Atoll, including the location where it was last observed.

No critical habitat has not been designated at Midway Atoll for *Cenchrus agriminoides*.

B. Proposed species and/or proposed critical habitat within the action area:

No proposed listed species or critical habitat occurs at Midway Atoll.

C. Candidate species within the action area, habitat, and occurrence:

1. Popolo (*Solanum nelsonii*), plant

Popolo was thought to be extirpated at Midway Atoll, but a small population was discovered on Spit Island in 1996 by the Service (Starr and Martz 1999). Seeds were taken from the plants, propagated in the greenhouse on Sand Island, and outplanted in and around wetlands on Sand and Eastern Islands. Survivorship of the outplantings has been encouraging, and seed has been obtained for current propagation from these sites as well.

IV. Geographic area and location:

Midway Atoll is an insular territory of the United States administered by the Service as a National Wildlife Refuge, and is part of the Hawaiian Islands archipelago that lies to the northwest of the seven main Hawaiian Islands (Fig. 7). The refuge encompasses a total of 235,473 ha (581,864 acres, Fig. 8) and consists of three islands: Sand 452 ha (1,117 acres), Eastern 136 ha (336 acres), and Spit Island 6 ha (15 acres, Klavitter 2004). The total submerged area (everything underwater, including areas inside the atoll) is 234,877 ha (580,394 acres). Of this amount, approximately 245 ha (605 acres) are emergent reef. Total upland area (all the dry land inside the atoll) is 594 ha (1,468 acres). The refuge boundaries are circular in nature and extend 22.2 km (12 nautical miles) out from the fringing coral reef. The airfield (58 ha, 143 acres) is located on Sand Island.

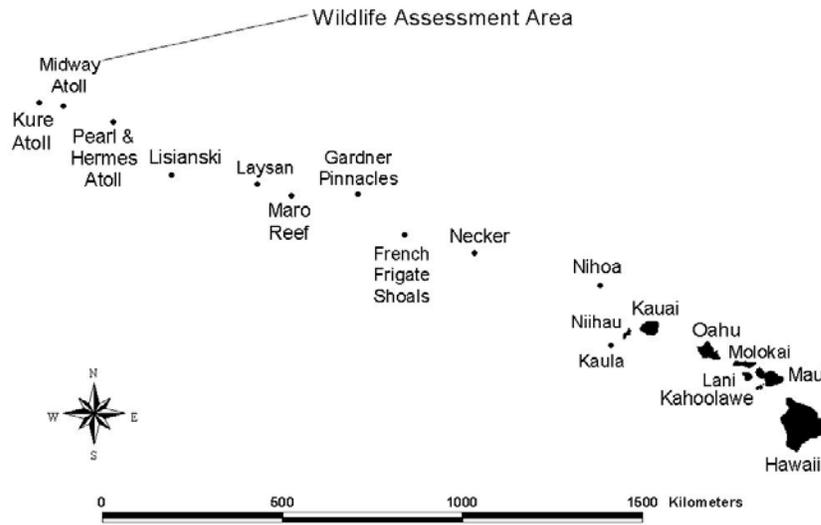


Figure 7. Hawaiian Islands archipelago with reference to Midway Atoll.

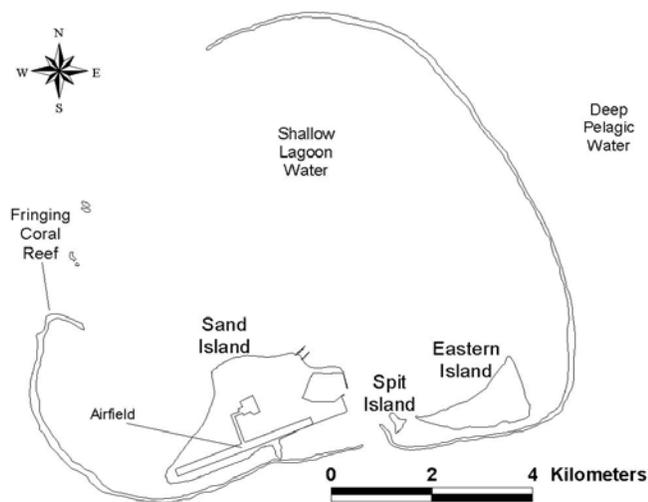


Figure 8. Sand, Eastern, and Spit Islands within Midway Atoll.

A. Ecoregion Number and Name:

Region 1, Pacific Islands Ecoregion.

B. County and State:

Midway Atoll is not part of any State.

C. Section, township, and range (or latitude and longitude):

Midway Atoll is at latitude 28.2° N, longitude 177.3° W.

D. Distance and direction to nearest town:

Midway Atoll is located approximately 2,012 km (1,250 miles) northwest of Honolulu, Hawaii.

V. Description of proposed action:

The Service is proposing to implement an interim visitor services plan at Midway Atoll to allow the public the opportunity for education and interpretation of wildlife and historic resources and compatible wildlife-dependent recreation.

The interim visitor services plan would be overseen by the Service. It was developed by visitor services specialists in close coordination with refuge managers and biologists. The objective of the visitor services plan at Midway Atoll is to provide high quality, compatible wildlife or historic related education and recreational experiences. The visitor services plan would include the following activities:

- (1) Wildlife observation and photography
- (2) Participatory management/research program
- (3) Environmental education and interpretation
- (4) Airport operation (for non-administrative purposes)
- (5) Nonwildlife-dependent beach use
- (6) Nonwildlife-related sports
- (7) Amateur radio operation

In order to ensure protection of wildlife and a safe and enjoyable visitor experience, the total number of overnight visitors allowed on the refuge at any one time will be limited to 30 people in 2007 and 50 people in 2008 and beyond. This number may be exceeded for short duration (less than a day) prearranged visits by ocean vessels or aircraft. In these cases, visitor activities are closely supervised and primarily consist of guided tours or participation in commemorative events.

For the next 5 years (2007-2011), visitor programs will operate from November through July, which coincides with the albatross season on Midway Atoll. The months of August through

October are reserved for planned construction activities. Very few rooms will be available during these months due to the number of contractors on island, and aircraft capacity will be needed both for contractors and supplies. To ensure the safety of visitors and enhance their experience on Midway Atoll, visitor programs will be concentrated in this 9-month time frame.

The goals and objectives for the visitor services program at Midway Atoll National Wildlife Refuge/Battle of Midway National Memorial are summarized in the table below. More detailed information, including strategies, is discussed in the visitor services plan (Service 2006a). Unless otherwise stated, the objectives and strategies will be completed by Service staff and begin upon plan approval.

| Management Goals | Objectives |
|--|--|
| <p><i>Goal 1.</i> Conserve and restore the natural diversity and abundance of native plants and animals, both terrestrial and marine, at Midway Atoll, emphasizing seabirds and shorebirds, threatened and endangered species, and coastal and marine communities.</p> | <p><i>Objective 1.1</i> Incorporate at least 75 percent of visitors staying 3 days or longer into the refuge volunteer program for habitat restoration.</p> |
| | <p><i>Objective 1.2</i> Provide 30 percent of visitors staying 3 days or longer opportunities to observe wildlife population monitoring</p> |
| | <p><i>Objective 1.3</i> Continue efforts to support the habitat restoration program sponsored by the Friends of Midway Atoll National Wildlife Refuge.</p> |
| <p><i>Goal 2.</i> Offer visitors, residents, and people afar opportunities to discover, enjoy, and appreciate the Northwestern Hawaiian Islands ecosystem through wildlife-dependent recreational and educational activities.</p> | <p><i>Objective 2.1</i> During 2007, provide visitor opportunities for at least 100 overnight visitors.</p> |
| | <p><i>Objective 2.2</i> During 2008, reestablish a regularly scheduled visitor services program for at least 500 overnight visitors.</p> |
| | <p><i>Objective 2.3</i> Provide visitor opportunities for private sailboats and up to three cruise ships per year.</p> |
| | <p><i>Objective 2.4</i> Ensure all visitors feel welcome, enjoy a safe experience, and understand refuge rules and regulations during their stay on Midway Atoll.</p> |
| | <p><i>Objective 2.5</i> Within 3 years, improve wildlife viewing and photography opportunities for all visitors to Midway Atoll.</p> |
| | <p><i>Objective 2.6</i> Work with and encourage qualified groups or individuals to develop specialized programs at Midway Atoll in wildlife monitoring, photography, and art in 2008 and beyond.</p> |
| | <p><i>Objective 2.7</i> Develop and provide biennial wildlife-dependent teacher workshops specifically targeting teachers who do not have a strong science background or interest.</p> |

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| | <p><i>Objective 2.8:</i> Beginning in 2008, facilitate at least two opportunities per year for accredited colleges, universities, or private/nonprofit environmental or historical organizations to conduct wildlife-dependent college level courses or administer informal educational camps.</p> |
| | <p><i>Objective 2.9:</i> By January 2011, evaluate the feasibility of conducting a distance learning program from Midway Atoll.</p> |
| | <p><i>Objective 2.10</i> By 2008, improve onsite interpretation and interpretive facilities to better educate visitors about Midway Atoll and the Northwestern Hawaiian Islands.</p> |
| | <p><i>Objective 2.11</i> By 2008, develop at least two offsite exhibits and programs to educate the general public about the Northwestern Hawaiian Islands and Midway Atoll National Wildlife Refuge in particular.</p> |
| | <p><i>Objective 2.12</i> Allow residents and visitors to engage in other recreational uses on Midway Atoll that have been determined to be compatible with the mission of the National Wildlife Refuge System and the purposes of the refuge.</p> |
| | <p><i>Objective 2.13</i> On a continuing basis, maintain outreach efforts to Midway Atoll’s diverse key publics to update them on the visitor program and wildlife-oriented news stories.</p> |
| | <p><i>Objective 2.14</i> By November 2007, evaluate the effectiveness of the visitor program marketing effort.</p> |
| <p><i>Goal 3.</i> Honor, maintain, and interpret the unique historical resources of Midway Atoll, with emphasis on its status as the Battle of Midway National Memorial.</p> | <p><i>Objective 3.1</i> By 2008, improve onsite interpretation and interpretive facilities to better educate visitors about the Battle of Midway National Memorial and Midway Atoll’s early history.</p> |
| | <p><i>Objective 3.2</i> By 2008, develop at least two offsite exhibits to educate the general public about the Battle of Midway National Memorial.</p> |
| | <p><i>Objective 3.3</i> Working with partners, offer special events on Midway Atoll and at other offsite locations that honor its history.</p> |
| | <p><i>Objective 3.4</i> Seek grant funds to bring at least two groups of volunteers to Midway Atoll each year to work on historic restoration projects under the guidance of the Service’s cultural resources staff and/or historic preservation specialists.</p> |
| | <p><i>Objective 3.5</i> Provide at least 15 percent of visitors staying 3 days or longer opportunities to assist with historic preservation tasks and activities.</p> |

VI. Explanations of impacts of Action and methods to reduce adverse effects:

A number of means to avoid adverse effects to refuge natural resources were designed into the visitor services plan. Many of these are described in the Environmental Assessment and refuge compatibility determinations (Service 2006a,b). The Service would provide adequate resources to implement the visitor services plan and ensure that the program is environmentally sensitive and minimizes human disturbances to wildlife. This would be done by: (1) providing sufficient staffing; (2) defining permitted activities; (3) providing guidelines for uses; (4) designating open and closed areas; (5) providing a high level of public information (pre-visit packets, staff and visitor orientations, lectures, brochures, guided tours and static displays); (6) restricting access to and within sensitive wildlife areas; (7) systematically monitoring visitor impacts on wildlife and implementing visitor program changes as determined necessary by the refuge manager; and (8) coordinating with other natural resource agencies in the development and implementation of the visitor program.

1) Wildlife observation and photography

Stress reactions (elevated heart rate, elevated levels of corticosterone, and behavioral responses) have been documented in several species of nesting seabirds at several ecotourism locations as a result of human activities in nesting colonies (Jungius and Mirsch 1979, Fowler 1995, Nimon *et al.* 1995 and Kataysky *et al.*, 2003). Studies, however, have not been conducted to document long-term cumulative effects of human disturbance. Albatross in the developed part of Sand Island are clearly acclimated to the presence of people, but may still have elevated stress hormone levels. When visitors are observing albatrosses, Laysan ducks, bristle-thighed curlews, Pacific golden plovers, and Christmas shearwaters in the less visited areas, they will have the potential of greatly elevating stress hormone levels if the duration of the disturbance is excessive. Studies have shown (Kitaysky, *et al.*, 2003) that short term disturbance, however, has only minor, short term effects. Observation periods for any particular bird or group of birds away from the town area of Sand Island will be kept to 15 minutes or less and only infrequently for this reason.

Green sea turtles resting on beaches may be disturbed. Visitor programs will be designed and managed to minimize or eliminate these impacts. However, even with proper management and execution of a well run program, certain behavioral responses may occur that are not easily observable.

Visitors may accidentally trample rare plants and insects (Fullaway's seed bug, *Laysan oodemas* weevil, *Obscure pentarthrum* weevil, *Achyranthes atollensis*, pua pilo, anaunau, *Phyllostegia variabilis*, and popolo) as they observe wildlife and photograph.

Methods to reduce adverse effects

- Visitors and residents are provided orientation materials and related information to minimize disturbance to wildlife. Specific restrictions (e.g., 50 m approach distance for short-tailed albatross and Laysan duck seeps, prohibition of access to heavily burrowed areas, etc.) are strictly enforced. Information on the nesting locations of particularly rare species may be withheld to protect these birds from disturbance.

- Professional photographers who desire access to areas not generally accessible to the public will be put under Special Use Permits that stipulate more detailed access restrictions and regulations to protect wildlife. At the discretion of the refuge manager, Service staff may be assigned to accompany professional photographers into particularly sensitive areas.
- The beaches on Spit and Eastern Island will be closed to visitor as well as the southern and western beaches on Sand Island. Boats will not be allowed to travel closer than 500 feet from these closed beaches, except for guided tours to tie up to the Pier on Eastern Island.
- All trips to Eastern Island for wildlife observation and/or photography will be closely supervised by Service staff or Service-certified guides. The number of visitor tours of Eastern Island will be controlled by the refuge manager (typically only one or two per week), and generally will be completed within a 2-hour period. Spit Island will be off limits for wildlife observers and photographers unless they accompany Service staff or permitted researchers during authorized project visits.
- Visitors will not be allowed to approach closer than 50 m to Laysan duck seeps. This will prevent visitors from impacting Laysan ducks are the rare plants that have been outplanted near them. The blind at the water catchment basin will allow visitors to see the species without disturbing the Laysan ducks, curlews, plovers, as well as other migratory birds.
- Kayaking tours will be closely supervised by Service staff, Service-trained volunteers, or cooperators. Buffer zones using the NOAA Watchable Wildlife suggested distance of 50 m will be enforced as well as closures of selected lagoon areas to minimize disturbance of wildlife. Visitors will be advised of proper actions to avoid disturbance and all tours will follow planned routes designed to minimize disturbance and avoid sensitive areas.
- Visitors and their luggage will go through an inspection for insects and plants prior to departing Honolulu, and again when leaving Midway to reduce the possibility of alien species introductions. Visitors will be asked to clean their shoes and other clothing before coming to Midway through advance introductory materials. Visitors will be asked to check their gear for mice before proceeding to Eastern to prevent accidental introductions. Visitors will be asked to clean their shoes and clothing before proceeding to Eastern to prevent accidentally introducing invasive plants to Eastern from Sand Island. Just before returning to Sand Island from Eastern, visitors will be asked to once again clean their shoes, clothing, and gear to prevent spread of invasive black mustard (*Brassica nigra*) on Sand Island.
- Additional surveys will be conducted for rare plants and insects (Fullaway's seed bug, *Laysan oodemas* weevil, *Obscure pentarthrum* weevil, *Achyranthes atollensis*, pua pilo, anaunau, *Phyllostegia variabilis*, and popolo). Populations will be mapped out and signs effected to prevent visitors from impacting these species. Future propagation of these rare species can occur on the refuge and progeny released or outplanted at protected sites.

2) Participatory management/research program

Seabird population monitoring. Minimal impact is anticipated from activity of participatory research volunteers within nesting seabird colonies. Potential impacts include crushing nesting Christmas shearwaters and Laysan ducks and temporary disturbance to nesting Laysan and black-footed albatrosses. Stress reactions (elevated heart rate, elevated levels of corticosterone, and behavioral responses) have been documented in several species of nesting seabirds at several ecotourism locations as a result of human activities in nesting colonies (Jungius and Mirsch 1979, Fowler 1995, and Nimon *et al.* 1995). Studies, however, have not been conducted to document the long-term cumulative effects of this human disturbance. Another study on murrelets documented an increased stress response when birds were handled for a longer period during research activities (Newman *et al.* 1997). Short-term participatory research volunteers will be working at a slower pace than a trained Service biologist or volunteer, potentially increasing the amount of disturbance to nesting seabirds involved in the study or in the area.

Habitat restoration. Minimal to no impact to terrestrial species found within the targeted habitat restoration area is anticipated. Potential impacts include crushing nesting Christmas shearwaters and Laysan ducks and temporary disturbance to nesting Laysan and black-footed albatrosses.

Historic site preservation. Minimal to no impact on terrestrial species from actions to stabilize historical structures or to remove invasive trees and shrubs. Potential impacts include crushing nesting Christmas shearwaters and Laysan ducks and temporary disturbance to nesting Laysan and black-footed albatrosses.

Methods to reduce adverse effects

All participating visitors will attend the initial orientation and will be thoroughly briefed by the Service or Service-trained personnel on the approved and prohibited activities.

Participants involved in seabird projects will be shown how to collect data to avoid or minimize nesting bird disturbance, including Laysan ducks and Christmas shearwaters.

Participants in habitat restoration projects will be supervised by Service personnel or Service-trained cooperators. They will avoid areas where nesting (including burrowing) birds will be disturbed.

- Participants involved in beach cleanup will be supervised by Service personnel or Service-certified cooperators and focus on the “open” beaches. “Closed” beaches will be cleaned only when monk seals are not present and on a quarterly basis.

3) Environmental education and interpretation

Environmental Education

Impacts from visitors attending scheduled workshops, participating in walking or biking interpretive tours, or self-guided tours on Sand Island will be minimal. All of these activities will occur on hard surfaced roads with very limited wildlife disturbance.

Minimal to no impact on refuge purposes is anticipated from off-site programs, since educational demonstrations will be conducted or supervised by trained Service staff.

Interpretation

Minimal impact to refuge purposes is anticipated as described in the above “guided walks and bicycle tours” section. Additional potential impact to rare terrestrial species may occur if visitors and residents wander off self-guiding interpretive walks. Impacts include crushing nesting Christmas shearwaters and Laysan ducks and temporary disturbance to nesting Laysan and black-footed albatrosses. Studies conducted in seabird colonies with ecotourism operations have documented that birds located away from frequently visited areas react strongly to any human activity. Birds were observed to habituate to high levels of constant visitation, but not to less constant (although regular) visitation (Fowler 1995). Therefore, birds located far from trails are most likely to be disturbed from wandering visitors or residents. Disturbance of resting green sea turtles could occur if visitors and residents wander off self-guided interpretive walks.

Cruise ships that visit Midway Atoll are required to anchor outside the harbor entrance channel and to ferry their passengers to shore via ship’s tenders. New invasive species could arrive to the refuge as hitchhikers aboard visitors’ clothing and gear.

Regularly scheduled “field talks” at selected locations by Service interpreters or cooperators

There will be minimal to no anticipated impacts on refuges purposes associated with regularly scheduled “field talks”. Talks will be located near seabird colonies, but leaders and participants will not enter into the main area of the colony for these talks. Keeping the group at the edge of the colony will limit stress to the few birds actually closest to the group. Studies have shown that birds can adapt to repeated disturbance, so selection of an area where the birds are regularly passed by residents and visitors on town roads will minimize the impact of this activity.

Potential impacts include brief disturbance to nesting seabirds when entering colonies and handling of birds for demonstrations. Only trained Service interpreters or cooperators conducting the talk will be entering nesting colonies or handling birds for demonstrations.

Evening programs at various indoor locations.

No anticipated impacts are anticipated due to indoor locations.

Eastern Island tours.

Minimal impacts include disturbance to nesting Laysan and black-footed albatrosses along tour routes or resting green sea turtles near the dock. Tours will be restricted to the historical runways, limiting the disturbance to rare terrestrial species.

Methods to reduce adverse effects

- All onsite environmental education will be closely supervised by Service staff and Service-trained volunteers and cooperators, as well as by accompanying teachers.
- All students will be subject to the same restrictions (e.g., beach closures, distances from short-tailed albatrosses and Laysan ducks, etc.) as other visitors.
- All guided Sand Island tours will be led by Service, Service-trained, or cooperator-trained interpreters and will be adjusted on the spot to avoid disturbance of short-tailed albatrosses, Laysan ducks, curlews, plovers, and Christmas shearwaters, and trampling of rare plants and insects.
- No more than 25 people will be led at one time on guided walks and bicycle tours.
- All visitors will attend an orientation upon (or before) arrival and be given appropriate narrative and graphic material to clearly indicate which areas are open for public use and to clarify regulations in force to protect wildlife and habitat. Cruise ship visitors receive an orientation from a Service representative onboard ship or by handouts specific to their visit to Midway Atoll.
- Signing along self-guided trails will identify approved areas for beach access, wildlife observation, *etc.* Service and cooperator staff will monitor public use to assess and respond to incidents of noncompliance with refuge regulations. Vegetative screening will be used to ensure that visitors do not walk off trails.
- “Field talks” will be located outside, on roads or trails along the edge of nesting seabird colonies. Only trained Service interpreters or cooperators conducting the talk will be entering nesting colonies or handling birds for demonstrations for brief periods.
- Interpreters will clearly explain the rationale for access restrictions and the actions that will be taken to enforce regulations.
- The frequency, duration, and route of guided Eastern Island tours will be modified, as needed, to avoid disturbance to green sea turtles, short-tailed albatrosses, Laysan ducks, curlews, plovers, and Christmas shearwaters.
- Cruise ships will be prohibited from discharging of any gray or black water during their anchorage period and for the entire period they are within monument waters. Visitors will inspect clothing and equipment for seeds and insects before arriving to the refuge.

4) Airport operation (for nonadministrative purposes)

Laysan and black-footed albatross use the airport runway as a soaring area as they travel on feeding forays during the day and could be struck by aircraft landing or taking off. Laysan ducks have been observed walking on the runway and taxiway during the day and night, so could be struck by an aircraft landing or taking off or airport vehicles that are inspecting the runway or preparing for airport operations.

Extensive use of lights at the airport hangar causes problems for seabirds and potentially Laysan ducks in the future. These birds are disoriented by the bright flood lights at the hangar and as a result frequently fly into the side of the building and roof.

Proper operation of the fuel truck presents no hazards to refuge resources. In the event of a spill, fuel containment supplies and equipment are stored at the airport hangar for immediate response.

Methods to reduce adverse effects

- Except for emergency landings, flights will be required to land and depart during the dark from November through July. Airport vehicles will travel at modest speeds so they do not accidentally run over Laysan ducks on the runway and taxiways. If Laysan ducks are observed on the runway or taxiway immediately preceding an aircraft operation, they will slowly approach the animal until it moves out of the danger area.
- To reduce the time during which aircraft fly at heights used most frequently by albatrosses and other rare birds (one thousand feet or less), aircraft will be advised to use steeper than normal landing and take-off flight paths. For landings, pilots will be advised to use a 1500' displaced threshold and then descend at a 5 degree glide slope. For take-offs, pilots will be advised to be airborne by midfield and then to climb out at a path of 10-11 degrees pitch up for first 1000 feet of elevation.
- Lights used to illuminate airport passenger and baggage handling areas must be designed and installed to reduce impacts to albatrosses, Laysan ducks, and other birds that are negatively affected by artificial light.

5) Nonwildlife-dependent beach use

Minimal to no negative impacts to refuge resources are expected from this activity. Visitors could displace resting green sea turtles or bristle-thighed curlews from preferred beach areas if refuge visitor guidelines regarding beach use are not followed. Since no seabird or Laysan duck nesting occurs in the areas used for this activity, no impacts to albatross, shearwaters, Laysan ducks or other birds are expected.

Methods to reduce adverse effects

- Visitors will be advised not to trample native vegetation and avoid approaching bristle-thighed curlews.
- Closed beach areas will be posted and regulations strictly enforced. Residents and visitors will be informed about closed area restrictions through orientation sessions and posted notices. A 50 m approach restriction for sea turtles will be strictly enforced.

6) Nonwildlife-related sports

These activities include swimming, biking, jogging, volleyball, tennis, and other sports inside of the gym. These activities will present little or no impact to listed species. Visitors could accidentally run over a Laysan duck or short-tailed albatross with a bicycle. This is more likely to occur with ducks at night, when they freeze when a light is shown on them.

Occasional disturbance to nesting albatross or albatross chicks may occur around the outdoor volleyball court, but the court has a nest-free margin of 10 m giving the birds an adequate buffer from court activity and stray balls. The court area is free of petrel or shearwater burrows, so no impacts will occur to those ground nesting birds. Bicycling and jogging will also result in little or no impact on wildlife because bikers and joggers will remain on paved roads or marked trails. Joggers will be directed to stay on the paved/gravel roads due to the high risk of stepping on a duck, seabird, nest or burrow.

Methods to reduce adverse effects

- Closed areas will be posted and regulations strictly enforced. Residents and visitors will be informed about closed area restrictions through orientation sessions and posted notices.
- Bicycling and jogging will be limited to paved and gravel roads and trails during daylight hours only (sunrise to sunset). Bicycles will stay at least 50-m away from Laysan ducks, short-tailed albatross, and will not enter the 50-m buffer areas around the wetlands. A stationary bike and treadmill will be installed in the gym so visitors can exercise during nighttime hours.
- A 50 m approach restriction for short-tailed albatross will be strictly enforced. If a Laysan duck or short-tailed albatross moved to within this distance of the volleyball court, the area would not be used (or the game stopped) until the animal voluntarily left the area.
- The volleyball net will be taken down and stored when not in use to eliminate the threat of injuring a bird in flight.

7) Ham radio operation

Ham radio operation will not occur near areas used by Laysan ducks, short-tailed albatrosses, or green sea turtles. Antennas will be flexible in nature and less than 2-m in length so a bird will not be injured if they collide with it. In August 2006 a Laysan duck was killed after it crashed into power lines on the refuge (Service, unpub. data).

The antennae for transmitting the radio signal is the only aspect of this use that has potential for impacting refuge resources. The high density of nesting seabirds on Sand Island makes installation of additional tall antennae, even for a short period, a concern as they are a strike hazard for flying birds. Shorter antennae, locations away from primary flight lanes, attachment to large objects avoided by the birds (e.g., the water tower) and time of year are all means to reduce this impact. With proper use of the above techniques, minimal or no impacts are expected to refuge resources.

Methods to reduce adverse effects

- Use of freestanding antennae greater than 2 m will be allowed only during the months of August, September, and October when albatross are off-island. Even during this period,

location must be approved by the refuge manager to ensure that other species (curlews, Laysan ducks, plovers, and Christmas shearwaters) are not affected.

- Use of freestanding antennae during the period from November through July will be allowed only if advance discussion with the refuge manager has clearly shown that the location and antennae type will not be a flight obstacle to birds.

VII. Literature Cited

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VIII. Effect determination and response requested:

A. Listed species/designated critical habitat:

| <u>Determination</u> | <u>Response requested</u> |
|---|---------------------------|
| no effect/no adverse modification (species: _____) | ___Concurrence |
| may affect, but is not likely to adversely affect: (species: short-tailed albatross, Laysan duck, green sea turtle, <i>Cenchrus agriminoides</i> var. <i>laysanensis</i>) | <u> X </u> Concurrence |
| may affect, and is likely to adversely affect species/adversely modify critical habitat (species: _____) | ___Formal Consultation |

B. Proposed species/proposed critical habitat:

| <u>Determination</u> | <u>Response requested</u> |
|---|---------------------------|
| Not applicable | |
| no effect on proposed species/no adverse modification of proposed critical habitat (species: _____) | ___Concurrence |
| is likely to jeopardize proposed species/adversely modify proposed critical habitat (species: _____) | ___Conference |

C. Candidate species:

| <u>Determination</u> | <u>Response requested</u> |
|--|---------------------------|
| no effect/no adverse modification (species: _____) | ___Concurrence |
| may affect, but is not likely to adversely affect (species:, popolo,) | <u> X </u> Concurrence |

is likely to jeopardize candidate species

(species: _____) _____ Conference

Initiating Office:

John Klavitt

Wildlife Biologist
Midway Atoll National Wildlife Refuge

3/16/07

Date

Attachments

Reviewing Evaluation:

- A. Concurrence Nonconcurrency _____
- B. Formal consultation required _____
- C. Conference required _____
- D. Informal conference required _____
- E. Remarks (attach additional pages as needed):

Barry Christensen

Refuge Manager
Midway Atoll National Wildlife Refuge

3-16-2007

Date

DRAFT INTERAGENCY SECTION 7 BIOLOGICAL EVALUATION FORM
for
the Interim Visitor Services Plan for Midway Atoll National Wildlife Refuge,
Battle of Midway National Memorial,
and Papahānaumokuākea Marine National Monument

Notes:

- 1) Staff from the U.S. Fish and Wildlife Service (John Klavitter and Barry Christenson) have met several times to discuss this plan Biological Evaluation with National Marine Fisheries Service (NOAA-Fisheries) Section 7 staff (Arlene Pangelinan). Meetings were initiated during late August 2006. Multiple emails and phone calls have also been exchanged between the two agencies to answer questions and make improvement to this document.
- 2) Only marine species were evaluated in this document. Terrestrial species were evaluated in separate Intra-Service Section 7 Biological Evaluation.

Originating Persons: Barry Stieglitz, Barry Christenson, John Klavitter, Barbara Maxfield

Telephone Number: (808) 792-9540, (808) 674-8237

Date: May 13, 2007

I. Region: 1 - Hawaiian and Pacific Islands National Wildlife Refuge Complex, Honolulu, Hawaii

II. U.S. Fish and Wildlife Service (FWS) Activity:

FWS is proposing to implement an interim visitor services plan at Midway Atoll National Wildlife Refuge, Battle of Midway National Memorial (Midway Atoll), which are now part of the Papahānaumokuākea Marine National Monument. This action will aid in satisfying requirements of the National Wildlife Refuge System Administration Act of 1966, as amended, and will allow the public the opportunity for education and interpretation of wildlife and historic resources and compatible wildlife-dependent recreation at Midway Atoll.

III. Species and Habitat:

A. Listed species and/or their critical habitat within the action area:

1. Green sea turtle (*Chelonia mydas*), threatened

Green sea turtles occur at Midway Atoll. They are seen in the waters of the lagoon, along certain shorelines, in and around surrounding coral reefs, and in deeper pelagic waters. No turtle nesting had been documented until successfully hatched eggs were discovered on Spit Islet in July 2006 (FWS unpub. data). High surf uncovered the eggs which probably hatched the previous year.

2. Hawksbill sea turtle (*Eretmochelys imbricata*), endangered

Hawksbill sea turtles are infrequently seen in the lagoon.

3. Leatherback sea turtle (*Dermochelys coriacea*), endangered

One leatherback sea turtle washed up dead at Midway Atoll in the early 1990s (D. Williams, FWS, pers. comm.).

4. Loggerhead sea turtle (*Caretta caretta*), threatened

At least one loggerhead sea turtle with a satellite tag spent time in refuge waters in 2003 (G. Balazs, NOAA-Fisheries, pers. comm.).

5. Hawaiian monk seals (*Monachus schauinslandi*), endangered

About 65 endangered Hawaiian monk seals are usually present at Midway Atoll at any one time, and pupping levels have increased significantly since 1996, with a record number of 17 in 2004 (NOAA-Fisheries unpub. data). However, survivorship of juveniles is low and the species is highly endangered.

Portions of Midway Atoll have been designated as critical habitat for the Hawaiian monk seal, including all beach areas, sand spits and islets, all beach crest vegetation to its deepest extent inland, lagoon waters, inner reef waters, and ocean waters out to a depth of 20 fathoms (except for Sand Island and its harbor) (50 CFR, Part 226, Vol. 53, No. 102, May 28, 1988).

6. Humpback whale (*Megaptera novaeangliae*), endangered

Humpback whales are infrequently seen in deeper pelagic waters.

7. Sperm whale (*Physeter macrocephalus*), endangered

Only one sighting has been recorded at Midway Atoll. A sperm whale washed up dead on the surrounding coral reef in the late 1990s (N. Hoffman, FWS, pers. comm.). The skeleton is currently on display outside the visitor center at Midway Atoll.

B. Proposed species and/or proposed critical habitat within the action area:

No proposed listed species or critical habitat occurs at Midway Atoll.

C. Candidate species within the action area:

No marine candidate species have been observed at Midway Atoll.

D. Species/habitat occurrence

1. Green sea turtle

FWS is the principal agency responsible for the management and protection of green and other sea turtles while they are on land, and NOAA-Fisheries is responsible when these species are found in waters. FWS has addressed its responsibilities for sea turtles in the Intra-agency Section 7 Biological Evaluation Form for the Interim Visitor Services Plan for Midway Atoll (FWS 2006c).

Green sea turtles have been observed in nearshore and offshore waters of Midway Atoll, so all marine waters are potential habitat, but most turtles are found swimming, foraging, nesting and basking in a few main areas (Fig. 2, FWS unpub. data). Turtles use these areas consistently throughout the year, except for nesting which is most likely limited to March through October. The first and only documented nest was found on the southeastern shores of Spit Island (Figs. 1, 2). The highest concentration of basking green sea turtles occurs on a 140-m section of beach on Sand Island called "Turtle Beach" (Fig. 2). The maximum number of turtles observed at one time was 28 (J. Klavitter, FWS, pers. obs.). The following information is from incidental green sea turtle observations made by FWS personnel. The maximum number of turtles seen basking by the Eastern Pier is approximately 7, although usually about 2 are seen at any one time. Approximately once a week, 1 turtle is seen basking on the boat ramp in the inner harbor. The maximum number of turtles swimming and foraging between Turtle Beach and the Inner Harbor is 7. This is about the same maximum number of turtles seen in the water around the Eastern Island at any one time.

The following is derived from Balazs et al. (2001). Juvenile turtles regularly feed on algae such as *Spyridia filamentosa* and *Centoceras clavulatum* growing on the iron seawalls and on wind-driven pelagic invertebrates that accumulated along the seawalls. Foraging on *Codium cuneatum* by subadults and adults takes place outside the atoll along the southern side. A small seagrass foraging pasture of *Halophila hawaiiiana* occurs inside the atoll adjacent to the Cargo Pier. Turtles are routinely sighted between the Inner Harbor and the Cargo Pier. A sonic tag placed on an adult male revealed long periods of resting at 6-8 m, probably under the Fuel and Cargo Piers.

2. Hawksbill sea turtle

Hawksbill sea turtles are infrequently seen in the lagoon. No hawksbill sea turtles have been observed at Midway in the last 5 years (FWS unpub. data).

3. Leatherback sea turtle

Since only one leatherback has ever been observed at Midway Atoll, the species is most likely very uncommon within the refuge, probably only occasionally migrating through deep, pelagic waters. Recent satellite tagging studies show that leatherback turtles tagged on coast of California coast migrated through the Hawaiian archipelago on their way to an area just north of Australasia (TOPP 2006).

4. Loggerhead sea turtle

Very little information is known about loggerhead sea turtles within Midway Atoll refuge waters. Since only one loggerhead has been recorded in the vicinity of Midway Atoll through satellite tagging studies, the species is most likely very uncommon within the refuge, probably only occasionally found in deep pelagic waters.

5. Hawaiian monk seals

Hawaiian monk seals are found resting (hauled out) on the beaches of Sand, Eastern, and Spit Islands as well as portions of the emergent coral reef (Fig. 3). The seals forage within the atoll, near the fringing reef, and outside the reef (Stewart 2004). Pupping has increased dramatically at Midway Atoll since the early 1990s (Fig. 4, NOAA-Fisheries unpub. data). This increase may be in part due to an expanding monk seal population at Kure with adult females immigrating to

Midway and the management action of restricting human access to beaches on Spit, Eastern, and a portion of Sand Island. The majority of the pups are born on Eastern and Spit Islands (Fig. 3), but 3 pups were born on Sand Island in 2006 (NOAA-Fisheries unpub. data). The births on Sand Island occurred at Frigate Point, the middle of West Beach, and at Rusty Bucket. Pups have also been born at Turtle Beach and one was born on the boat ramp in the Inner Harbor in 2002. This female had been recently attacked by a large shark and had severe gaping wounds throughout her mid section. She gave birth to a still-born pup on the boat ramp. She remained on or near the boat ramp for several weeks while she healed. Pupping on Sand Island has been rare, especially prior to 2002, and may be related to the fact that humans live on Sand Island and are not allowed access to Spit or Eastern except for scientific research or FWS guided visits. Since 2002 there have been 12 to 65 people stationed at Midway Atoll, down from approximately 150 people between 1996 and 2002.

Reef Hotel, a popular snorkeling location, appears to be an important reef haul out location for monk seals (Fig. 3). At least one monk seal is seen resting or swimming at this location on nearly every visit (FWS unpub. data).

Monk seals are often observed swimming adjacent to haul out and pupping beaches (Fig. 3). Recent deployment of satellite tags on six 2-year-old seals will provide additional information on marine habitat use inside and outside the atoll (Fig. 5).

Critical habitat was designated at Midway Atoll for Hawaiian monk seals and includes all beach areas, sand spits and islets, all beach crest vegetation to its deepest extent inland, lagoon waters, inner reef waters, and ocean waters out to a depth of 20 fathoms (except for Sand Island and its harbor) (50 CFR, Part 226, Vol. 53, No. 102, May 28, 1988).

6. Humpback whale

Very little information is known about humpback whale within Midway Atoll refuge waters. All of the infrequent sightings have been in deep pelagic waters of the refuge.

7. Sperm whale

Since only one (dead) Sperm whale has ever been recorded at Midway Atoll, they are most likely only occasional visitors as they pass through refuge waters during migration. They most likely occur in deep pelagic waters.

IV. Geographic area and location:

Midway Atoll is an insular possession of the United States administered by FWS as a national wildlife refuge, and is part of the Hawaiian Islands archipelago that lies to the northwest of the seven main Hawaiian Islands. It is also part of the Papahānaumokuākea Marine National Monument. The refuge encompasses a total of 235,473 ha (581,864 acres, Fig. 1) and consists of three islands: Sand 452 ha (1,117 acres), Eastern 136 ha (336 acres), and Spit Island 6 ha (15 acres, Klavitter 2004). The total submerged area (everything underwater, including areas inside the atoll) is 234,877 ha (580,394 acres). Of this amount, approximately 245 ha (605 acres) are emergent reef. Total upland area (all the dry land inside the atoll) is 594 ha (1,468 acres).

The refuge boundaries are circular in nature and extend 22.2 km (12 nautical miles) out from the fringing coral reef. The airfield (58 ha, 143 acres) is located on Sand Island.

For purposes of this assessment, the proposed action area Sand Island except the south and west beaches, the Inner Harbor, the Eastern Island Pier, terrestrial portions of Eastern Island excluding the beaches, portions of the lagoon, and an anchorage area for cruise ships located 1.5 miles outside of atoll entrance.

A. Ecoregion Number and Name:

Region 1, Pacific Islands Ecoregion.

B. County and State:

Midway Atoll is not part of any State.

C. Section, township, and range (or latitude and longitude):

Midway Atoll is at latitude 28.2° N, longitude 177.3° W.

D. Distance and direction to nearest town:

Midway Atoll is located approximately 2,012 km (1,250 miles) northwest of Honolulu, Hawaii.

V. Description of proposed action:

FWS is proposing to implement an interim visitor services plan at Midway Atoll to allow the public the opportunity for education and interpretation of wildlife and historic resources and compatible wildlife-dependent recreation.

The interim visitor services plan would be overseen by the Service. It was developed by visitor services specialists in close coordination with refuge managers and biologists. The objective of the visitor services plan at Midway Atoll is to provide high quality, compatible wildlife-or historic-related education and recreational experiences. The visitor services plan would include the following activities:

- (1) Wildlife observation and photography
- (2) Participatory management/research program
- (3) Environmental education and interpretation
- (4) Airport operation (for non-administrative purposes)
- (5) Nonwildlife-dependent beach use
- (6) Non-wildlife-related sports
- (7) Amateur radio operation

For the next 5 years (2007-2011), visitor programs will operate from November through July, which coincides with the albatross season on Midway Atoll. The months of August through

October are reserved for planned construction activities. Very few rooms will be available during these months due to the number of contractors on island, and aircraft capacity will be needed both for contractors and supplies. To ensure the safety of visitors and enhance their experience on Midway Atoll, visitor programs will be concentrated in this 9-month time frame.

All construction activities will be restricted to the terrestrial environment on Sand Island and include replacing the existing fuel farm and airport building with newer and significantly smaller versions, replacing the runway lights, resurfacing portions of the runway and taxiway, and repainting the runway. No impacts should occur to listed marine species. The majority of materials for construction will be shipped on 1-2 barges each year. Barges will be less than 100 m in length and towed by an appropriate tug boat. Barges and tugs will proceed at < 10 km/h inside the atoll and be escorted by a FWS vessel that will survey for sea turtles and marine mammals to avoid any negative impacts. Vessels will have hull inspections and be clean of seeds, insects, and rodents.

In order to ensure protection of wildlife and a safe and enjoyable visitor experience, the total number of overnight visitors allowed on the refuge at any one time will be limited to 30 people in 2007 and 40 people in 2008 and beyond. This number may be exceeded for short duration (less than a day) on prearranged visits by ocean vessels or aircraft. In these cases, visitor activities are closely supervised and primarily consist of guided tours or participation in commemorative events.

No public use activities will extend from Midway Atoll to other nearby parts of the Monument, such as Kure or Pearl and Hermes Reef.

The goals and objectives for the visitor services program at Midway Atoll National Wildlife Refuge/Battle of Midway National Memorial are summarized in the table below. More detailed information, including strategies, is discussed in the visitor services plan (FWS 2006a). Unless otherwise stated, the objectives and strategies will be completed by FWS staff and begin upon plan approval.

| Management Goals | Objectives |
|---|--|
| <p><i>Goal 1.</i> Conserve and restore the natural diversity and abundance of native plants and animals, both terrestrial and marine, at Midway Atoll, emphasizing seabirds and shorebirds, threatened and endangered species, and coastal and marine communities within the Northwestern Hawaiian Islands ecosystem.</p> | <p><i>Objective 1.1</i> Incorporate at least 75 percent of visitors staying 3 days or longer into the volunteer program for habitat restoration.</p> |
| | <p><i>Objective 1.2</i> Provide 25 percent of visitors staying 3 days or longer opportunities to assist with wildlife population monitoring as volunteers.</p> |
| | <p><i>Objective 1.3</i> Continue efforts to support the habitat restoration program sponsored by the Friends of Midway Atoll National Wildlife Refuge.</p> |

| Management Goals | Objectives |
|--|--|
| <p><i>Goal 2.</i> Offer visitors, residents, and people afar opportunities to discover, enjoy, and appreciate the Northwestern Hawaiian Islands ecosystem through wildlife-dependent activities.</p> | <p><i>Objective 2.1</i> During 2007, provide visitor opportunities for at least 50 overnight visitors, with no more than 30 overnight visitors at any one time.</p> |
| | <p><i>Objective 2.2</i> During 2008, reestablish a regularly scheduled visitor services program for at least 300 overnight visitors, with no more than 40 overnight visitors at any one time.</p> |
| | <p><i>Objective 2.3</i> Provide visitor opportunities for private sailboats and up to three individual cruise ship visits per year.</p> |
| | <p><i>Objective 2.4</i> Ensure all visitors feel welcome, enjoy a safe experience, and understand refuge and monument rules and regulations during their stay on Midway Atoll.</p> |
| | <p><i>Objective 2.5</i> Within 3 years, improve wildlife viewing and photography opportunities for all visitors to Midway Atoll.</p> |
| | <p><i>Objective 2.6</i> Work with and encourage qualified groups or individuals to develop specialized wildlife-dependent programs such as wildlife monitoring, photography, and art in 2008 and beyond.</p> |
| | <p><i>Objective 2.7</i> Develop and provide biennial wildlife-dependent teacher workshops targeting a mix of science teachers and teachers who do not have a strong science background or interest.</p> |
| | <p><i>Objective 2.8:</i> Beginning in 2008, facilitate at least two opportunities per year for accredited colleges, universities, or private/nonprofit environmental or historical organizations to conduct wildlife-dependent college level courses or administer informal educational camps.</p> |
| | <p><i>Objective 2.9:</i> In 2008, initiate a distance learning program from Midway Atoll to bring the Papahānaumokuākea Marine National Monument to classrooms across the Nation.</p> |
| | <p><i>Objective 2.10</i> By 2008, improve onsite interpretation and interpretive facilities to better educate visitors about Midway Atoll and the Northwestern Hawaiian Islands.</p> |
| | <p><i>Objective 2.11</i> By 2008, develop at least two offsite exhibits and programs to educate the general public about the Northwestern Hawaiian Islands and Midway Atoll in particular.</p> |
| | <p><i>Objective 2.12</i> Allow residents and visitors to engage in other recreational uses on Midway that have been determined to be compatible.</p> |

| Management Goals | Objectives |
|---|--|
| | <i>Objective 2.13</i> On a continuing basis, maintain outreach efforts to Midway's diverse audiences to update them on the visitor program and wildlife-oriented news stories. |
| | <i>Objective 2.14</i> By March 2008, evaluate the effectiveness of the visitor program marketing effort. |
| | <i>Objective 2.15.</i> Seek long-term well qualified volunteers to assist monument staff with the operation of the visitor services program. |
| <i>Goal 3.</i> Honor, maintain, and interpret the unique historical resources of Midway Atoll, with emphasis on its status as the Battle of Midway National Memorial. | <i>Objective 3.1</i> By 2008, improve onsite interpretation and interpretive facilities to better educate visitors about the Battle of Midway National Memorial and Midway's human history. |
| | <i>Objective 3.2</i> By 2009, develop at least two offsite exhibits to educate the general public about the Battle of Midway National Memorial. |
| | <i>Objective 3.3</i> Work with and encourage qualified groups or individuals to develop specialized historical programs that honor the Battle of Midway. |
| | <i>Objective 3.4</i> Working with partners, offer special events on Midway and at other offsite locations that honor its history. |
| | <i>Objective 3.5</i> Seek grant funds to bring at least two groups of volunteers to Midway each year to work on historic restoration projects under the guidance of FWS cultural resources staff and/or historic preservation specialists. |
| | <i>Objective 3.6</i> Provide at least 15 percent of visitors staying 3 days or longer opportunities to assist with historic preservation tasks and activities. |

Military activities and training have previously occurred on Midway. Due to the status of Midway as a national wildlife refuge, memorial, and monument, future military activity is not likely.

In addition, Midway will not be used as a base for visitor excursions to other places in the monument (i.e., Pearl and Hermes Reef, Kure Atoll).

VI. Explanations of impacts of Action and methods to reduce adverse effects:

A number of means to avoid adverse effects to Refuge natural resources were designed into the visitor services plan. Many of these are described in the environmental assessment and refuge compatibility determinations (FWS 2006a, b). FWS would provide the necessary resources to implement the visitor services plan and ensure that the program is environmentally sensitive and minimizes human disturbances to wildlife and their habitat, with emphasis on avoiding impacts

in critical habitat areas for Hawaiian monk seals defined earlier in this document. This would be done by: (1) providing sufficient staffing; (2) defining permitted activities; (3) providing guidelines for uses; (4) designating open and closed areas; (5) providing a high level of public information (pre-visit packets, staff and visitor orientations, lectures, brochures, guided tours and static displays); (6) restricting access to and within sensitive wildlife areas; (7) systematically monitoring visitor impacts on wildlife and implementing visitor program changes as determined necessary by the refuge manager; and (8) coordinating with other natural resource agencies in the development and implementation of the visitor program.

Gilmartin and Antonelis (1998) made recommendations for Hawaiian monk seal management and recovery at Midway Atoll. Those recommendations that are applicable to the visitor program are summarized below. FWS will plan to incorporate all of these recommendations to reduce adverse effects to monk seals, sea turtles, and other listed marine species.

- Analyze beach census data for haul out changes related to human activities (tours, aircraft, clean-up, research, etc.).
- Survey beaches for any direct evidence of noncompliance (e.g., footprints) with restrictions on human access. Where appropriate, use seal haul out data to recommend adjustment of human beach use.
- Document activities allowed at public use sites that may be detrimental to monk seals.
- Develop long-term habitat quality monitoring program, which should include testing prey for anthropogenic pollutants.
- Document apparent links between human activities and seal disturbance for FWS management actions.
- Develop an education program to prevent interactions between humans and monk seals.
 - Conduct frequent educational presentations to Midway residents and visitors on the conservation of Hawaiian monk seal and the importance of abiding by approach regulations to enhance the recovery of the species.
 - Develop a brochure for distribution on flights to Midway addressing the above.
 - Evaluate whether public viewing of monk seals can be managed in restricted areas at Midway, under supervision if necessary, so that disturbance does not occur.

1) Wildlife observation and photography

Description of Use(s):

Compatible wildlife observation and photography are priority general public uses as designated in the National Wildlife Refuge System Improvement Act of 1997. As such, most refuges, including Midway Atoll, seek means to allow these uses in an appropriate and compatible manner.

The abundance of wildlife at Midway Atoll will allow the public endless opportunities to observe and photograph many different species in their natural habitat. The seasonal activity of species such as the Laysan albatross (*Phoebastria immutabilis*) may drive increased visitor interest

during certain seasons. However, the diversity of fauna and flora, both marine and terrestrial, should encourage year- round public access.

On Sand Island, land-based observation and photography are enabled by trails, access to open beach areas, and observation towers. A stationary wildlife viewing blind will be erected to facilitate viewing Laysan ducks and migratory birds. Additional native vegetation will be added near Turtle Beach to serve as an observational screen. The possibility of a portable viewing blind for other species remains open for future visitor use.

On Eastern Island, wildlife observation and photography will occur under the guidance of FWS-approved staff and/or guides during walking tours of the island (excluding the beaches).

On land, most wildlife observation and photography would be conducted on foot, by bicycle, or by golf cart. Means to observe marine wildlife species will include snorkeling, diving, kayaking, and by power boat. Snorkeling and diving observation tours will be led by experienced FWS-approved staff and/or guides under tightly controlled group tours to specific locations. These locations will include known reef locations with safe swimming conditions, interesting coral formations, and abundant reef fish, but not sites of particular importance to endangered Hawaiian monk seals or threatened Hawaiian green sea turtles. Known shallow depth submerged artifacts such as World War II-era aircraft or vessels may be included as dive sites as they typically harbor abundant reef fish. Kayak tours will also be led by qualified personnel with groups limited to six kayaks or fewer traveling to specific locations. Wildlife observation from power boats will only be opportunistic as the boats are used to ferry visitors to and from snorkel/dive locations or Eastern Island. This will be the most frequent means for visitors to observe spinner dolphins. Hawaiian monk seals and Hawaiian green sea turtles may also be observed from a distance on refuge beaches where they frequently haul out to rest.

Anticipated Impacts of the Use(s):

Hawaiian monk seals and/or green sea turtles swimming, resting on beaches, and laying eggs or taking care of pups may be accidentally disturbed by visitors. Visitor programs will be designed and managed to minimize or eliminate these impacts. However, even with proper management and execution of a well run program, certain behavioral responses may occur that are not easily observable (Lavigne 1999).

Increased use of refuge waters also increases the potential for interaction/disturbance by boats, kayaks, or snorkelers/divers with monk seals, sea turtles, and spinner dolphins. Any action of pursuit or annoyance from boats potentially disturbs marine mammals in the wild by causing disruption of their behavioral patterns or displacement from essential habitat areas, especially if the dolphins or seals are in a rest phase. Snorkel or dive operations also include the added risk of damage to living coral on the refuge. Improper boat operation or visitor behavior could result in localized impacts to the coral reef from repeated anchoring, touching, standing, or other avoidable physical disturbance to the coral. Boats could run over turtles especially between Inner Harbor and the Fuel Pier.

Methods to reduce adverse effects

- All visitors and new residents are required to go through orientation immediately upon arrival or immediately the next day in the case of an unusual late arrival. Visitors and residents are provided orientation materials and related information to minimize disturbance to wildlife (“wildlife viewing etiquette”). Specific restrictions (e.g., 150-foot (50 m)) approach distance for seals and turtles, prohibition of access to Spit and Eastern Islands and portions of Sand Island are strictly enforced. The orientation materials include specific indicators of wildlife behavioral responses to disturbance, especially for the Hawaiian monk seal and green sea turtle, as well as appropriate visitor response to being approached by wildlife. The orientation also includes a visual demonstration of a 150-foot distance.
- The beaches on Spit and Eastern Island will be closed to visitors as well as the southern and western beaches on Sand Island (Fig. 1). Power boats will not be allowed to travel closer than 500 feet from these closed beaches, except for guided tours to tie up to the pier on Eastern Island (see Figure 3.1.2). Guided kayak tours may only travel more than 150 feet from closed beaches from Rusty Bucket counterclockwise to Frigate Point as described in the interim visitor services plan.
- Professional photographers who desire access to areas not generally open to the public will be required to obtain the appropriate monument permit type (i.e., education or special ocean use). These permits stipulate more detailed access restrictions and regulations to protect wildlife. At the discretion of the refuge manager, FWS-approved staff and/or guides will be assigned to accompany professional photographers into particularly sensitive areas.
- All trips to Eastern Island for wildlife observation and/or photography will be closely supervised by FWS-approved staff and/or guides. Visitor tours of Eastern Island will be offered no more than once a week, unless specifically authorized by the refuge manager, and generally will be completed within a 3-hour period. Boats will tether to either side of the ocean end of the 150-foot pier, and disembarking passengers will be briefed on proper behavior to minimize disturbance to Hawaiian monk seals or green sea turtles that may be present. Spit Island will be off limits for wildlife observers and photographers unless they accompany FWS-approved staff and/or guides or permitted researchers during authorized project visits.
- Kayaking tours will be closely supervised by FWS-approved staff and/or guides. Buffer zones using the NOAA Watchable Wildlife suggested distance of 150 feet will be enforced as well as closures of selected lagoon areas to minimize disturbance of marine life, for example, a monk seal with pup. Visitors will be advised of proper actions to avoid disturbance and specific indicators of wildlife behavioral responses to disturbance, and all tours will follow planned routes designed to minimize disturbance and avoid sensitive areas. Kayak guides will be trained at estimating the 150-foot minimum viewing distance and will be responsible for keeping the entire group together. Since West Beach, Rusty Bucket, and Frigate Point are known pupping areas, the buffer zone around these areas will be increased to 500 feet when there is a mother/pup pair present. The NOAA-Fisheries seal biologist on Midway will keep refuge staff informed of new

mother/pup pairs and their known locations. No kayaking will be allowed near Eastern or Spit Islands.

- Vessels involved in visitor activities will be required to return to dock at least 1 hour before sunset, which will also enhance boat operators' ability to avoid collisions with marine life. Visitors planning to engage in water-related activities during the albatross fledging season (June-July) will be thoroughly briefed on watching for shark activity, and water-related activities are not permitted during peak shark foraging times (½ hour before dusk to ½ hour after sunrise).
- Power boat operators may slow to allow visitor observation of approaching spinner dolphins, but will neither pursue the dolphins nor specifically seek them out. If dolphins are encountered during transit between two points, we will allow the boat to slow and/or stop for visitor observation, but entering the water will not be allowed. Routes to and from snorkeling/dive sites will be plotted to avoid known resting areas of spinner dolphins in the lagoon (Fig. 7), as well as preferred Hawaiian monk seal haul out, swimming/foraging, and pupping sites (Figs. 3, 5). Power boats will travel at less than 10 km/h in the Inner Harbor and from the Inner Harbor to the Cargo Pier so turtles are not accidentally run over.
- To eliminate anchoring impacts on coral, boat operators will be required to anchor in known sand areas. If a selected visitor use area has no suitable sand for anchoring, then a mooring buoy will be set in a manner to prevent the boat from damaging any living or dead coral.
- Power boats taking visitors to Eastern Island or snorkeling or diving may encounter spinner dolphins or, less frequently, green sea turtles while traversing the lagoon. Hawaiian monk seals are only rarely observed swimming in the lagoon. Boat operators will be fully briefed on known resting areas of spinner dolphins in the lagoon (Fig. 7) and routes to and from snorkel and dive sites will be plotted to avoid these areas as well as preferred Hawaiian monk seal haul out, swimming/foraging, and pupping sites.
- Snorkel and diving observational tours will be led by experienced FWS-approved staff and/or guides under tightly controlled group tours to specific locations. These locations will include known reef locations with safe swimming conditions, interesting coral formations, and abundant reef fish, but not sites of particular importance to endangered Hawaiian monk seals or threatened Hawaiian green sea turtles. Snorkel trips will be limited to 8 persons per guide and diving trips to 6 persons per guide. This will help ensure that the group stays together for safety reasons and to prevent visitors from straying into sensitive areas or approaching swimming monk seals or turtles. Selected snorkel locations will be chosen to offer good wildlife viewing and a safe anchor point for the visitor boat. These sites will be marked with a buoy to ensure that boats do not stray into sensitive areas. Total time visitors will be in the water for each trip will not exceed 120 minutes. The maximum number of people allowed in the water at any one time for snorkel trips would be 16 persons plus guides. The maximum number of people allowed diving at any one time would be 12 plus guides. Snorkel and dive trips would not exceed 4 each per week (144 each per year).

- Visitors and their luggage will go through an inspection for insects and plants prior to departing Honolulu and again when leaving Midway Atoll to reduce the possibility of alien species introductions. Visitors will be asked to bring either new shoes and clothing or clean their shoes and other clothing before coming to Midway Atoll through advance introductory materials.
- Only four-stroke outboard motors will be used for visitor program boats. These motors are quieter than two-stroke motors and will not exceed the Level A or Level B acoustic threshold for disturbance to marine mammals. No other loud sounds will be associated with this program. To further minimize possible acoustic impacts, boat operators will be advised to slow when approached by dolphins and proceed without stopping via the most direct route around the main body to their destination.
- Wildlife observation from power boats will only be opportunistic as the boats are used to ferry visitors to and from snorkel/dive locations or Eastern Island. Boats taking visitors to Eastern Island or snorkeling may encounter spinner dolphins or, less frequently, green sea turtles while traversing the lagoon. Hawaiian monk seals are only rarely observed swimming in the lagoon. Boat operators will be fully briefed on known resting areas of spinner dolphins in the lagoon (Fig. 6) and routes to and from snorkel sites will be plotted to avoid these areas.
- Additional native vegetation will be added near Turtle Beach to serve as an observation screen. The possibility of a portable viewing blind for other species remains open for future visitor use.
- Refuge biological staff will work with the NOAA-Fisheries seal biologist stationed on Midway to fine tune the monitoring plan described below to assess impacts to Hawaiian monk seals, sea turtles, and other listed species from the visitor program. This plan will be based on the existing data set of seal sightings on Sand Island over the past 10 years and available for public review. This monitoring plan will be drafted after approval of the Midway Atoll Interim Visitor Services Plan but prior to implementation of the full scale visitor services program. Long term trend analysis of use of the Sand Island beaches by monk seals should allow biologists to determine if there is a noticeable change (geographic shift or decrease) in seal beach use over time.
- Refuge rangers will have a data sheet for all organized activities (terrestrial and marine) and at a minimum will record type of activity, number of visitors, duration of the activity, and any disturbance to listed species. Refuge biological staff will work with \ NOAA-Fisheries to assess impacts to Hawaiian monk seals, sea turtles, and other listed marine species from the visitor program. This will consist of the NOAA-Fisheries Honolulu lab summarizing and interpreting two sets of data. The first set of data will be the intensive census and behavioral data that NOAA-Fisheries staff annually collects from April to August each year at Midway. The second set of data will be collected by refuge rangers and given to NOAA-Fisheries for analysis and interpretation. Refuge rangers guiding the visitors will be required to fill out a monk seal/sea turtle data form for all tour periods (Johanos and Ragen 1999, Appendix 1, 2) from November through July. If transients are involved in recreational activities during the August through October, they will be monitored by monument staff as needed. The purpose of this form is record seal and

turtle locations, numbers, and whether or not the animals were disturbed. FWS will request that NOAA-Fisheries give each refuge ranger training on how to complete the census form. It is important to note that refuge rangers will not approach the seals/turtles any closer than 150 feet and will not attempt to read tags. Rangers will record: date, observer, type of activity, number of visitors, duration and location of the activity, weather information, animal location, animal size, gender, bleach number, and level of disturbance if it occurs.

FWS will request that NOAA-Fisheries add a section to their annual Hawaiian monk seal report that summarizes the impacts of the visitor program using the two data sets. It will be important in the report to include the total number of disturbances, shifts in beach use for pupping and resting, and changes in abundance that may be related to the visitor program.

- FWS will request that NOAA-Fisheries seal biologist stationed on Midway carry out the recommendations made previously in this document (Gilmartin and Antonelis 1998) that are not covered by the data collection described above for refuge rangers and approved guides. They include but are not limited to:
 - Survey beaches for any direct evidence of noncompliance (e.g., footprints) with restrictions on human access (at least every other day). Where appropriate, use seal haul out data to recommend adjustment of human beach use.
 - Document activities allowed at public use sites that may be detrimental to monk seals.
 - Place temporary seal and/or turtle signs 150 feet from seals hauled out in non-restricted areas of Midway Atoll to alert visitors of a seal or turtle to avoid disturbance (daily).
- A review of files documenting past visitor violations of closed beaches and/or monk seal disturbance shows that many of the violators had not received orientation to the refuge and closed areas. Strict compliance with the orientation policy will address many of those types of violations in the planned visitor program. Some of the documented violations were clearly due to poor or nonexistent signing. A new sign plan will be developed by refuge staff and all signs put in place in 2008. Temporary signs may be used prior to that time. However, records also clearly show the need for a law enforcement officer who works in the field ensuring that refuge regulations are enforced. If adequate funding is appropriated, an officer will be stationed at Midway prior to implementation of the full scale visitor program. Prior to that time, law enforcement needs will be met through periodic use of officers on short-term details. Documented violations that occur during periods without an officer in place will be handled through an affidavit process by which the officer is provided specific details of the incident that are legally necessary for issuance of a Notice of Violation.

2) Participatory management/research program

Description of Use(s):

Specific visitor programs at Midway Atoll NWR will be designed to have visitors participate in a variety of wildlife monitoring and/or research activities, habitat management projects, and historic resource protection projects. Projects include (1) seabird population monitoring (e.g., nest abundance, nesting chronology, nesting success/chick survival, banding, etc.), (2) habitat restoration (e.g., clearing exotic vegetation, planting native vegetation, etc.), and (3) historic site preservation/restoration (e.g., rehabilitation of historic buildings or gun emplacements). All projects are conducted under the close supervision of FWS-approved staff and/or guides.

Anticipated Impacts of the Use(s):

This activity is planned mostly for the terrestrial environment, but some beach cleanups are planned on the beaches. Seals or turtles, especially those resting in the thick vegetation, could be disturbed.

Methods to reduce adverse effects

- All participating visitors will attend the initial orientation and will be thoroughly briefed by FWS-approved staff and/or guides on approved and prohibited activities.
- Participants involved in beach cleanup will be supervised by FWS-approved staff and/or guides and focus on the “open” beaches. “Closed” beaches will be cleaned only when monk seals are not present. No tow board cleanups of reefs will be conducted by visitor/participants.
- Refuge rangers will record all organized visitor activities a data sheet (appendices 1,2) and document any disturbances to listed species. Based on regular reviews of this data (at least yearly) by staff, the refuge manager will make modifications to the activity to further reduce or eliminate wildlife and habitat disturbances.

3) Environmental education and interpretation

Description of Use(s):

Both environmental education (EE) and interpretation strive to convey an understanding and appreciation of refuge resources and the issues that affect them

Due to Midway’s remote location and limited accessibility, onsite EE programs will be limited. However, with new technology, we will be able to offer offsite programs through satellite transmissions to schools around the world. Recognizing the role of teachers and educators in conveying EE to their students, refuge staff and partners will develop biennial teachers’ workshops to be held on Midway. These workshops will be linked to existing curriculums such as Navigating Change (Northwestern Hawaiian Islands multi-agency education project). Refuge

staff will also facilitate opportunities for cooperative organizations to conduct college level courses or education camps on Midway.

Interpretation of the natural and historic resources on Midway Atoll NWR and cultural resources of the Northwestern Hawaiian Islands will take many forms, including (1) guided walks and bicycle tours with FWS-approved staff and/or guides, (2) self-guided interpretive walks to selected historical sites, (3) regularly scheduled “field talks” with FWS-approved staff and/or guides who will demonstrate research techniques or natural history phenomena (e.g., evening petrel flights), and (4) indoor evening programs on various topics relative to Midway’s cultural, historic, and natural history. Visitors will also be able to participate on scheduled 3-hour field trips to Eastern Island, where they will be led on guided walks by FWS-approved staff and/or guides.

Visitors will be encouraged to come to the visitor center for further interpretation of refuge resources, environmental issues, and the Battle of Midway National Memorial. New exhibits will be developed that highlight the new Papahānaumokuākea Marine National Monument.

This use also includes visitors who arrive via cruise ship and are led on 2-hour interpretive tours by FWS-approved staff and/or guides.

Anticipated Impacts of the Use(s):

Environmental Education

Impacts from visitors attending scheduled workshops, participating in walking or biking interpretive tours, or self-guided tours on Sand Island will be minimal. All of these activities will occur on hard surfaced roads with very limited wildlife disturbance.

Minimal to no impact on refuge purposes is anticipated from off-site programs, since educational demonstrations will be conducted or supervised by trained FWS-approved staff and/or guides.

Interpretation

Minimal impact to refuge purposes is anticipated as described in the above “guided walks and bicycle tours” section. Additional potential impact to monk seals and green sea turtles may occur if visitors and residents wander off self-guided interpretive walks.

Cruise ships that visit Midway Atoll are required to anchor outside the harbor entrance channel and to ferry their passengers to shore via ship’s tenders (Fig. 7). Possible damage to coral could occur if the ship anchored in shallow water or drifted into coral areas. Tenders could run over turtles in the Inner Harbor. Gray or black water discharge from cruise ships could adversely affect coral or possibly monk seals or green sea turtles.

Evening programs at various indoor locations.

No anticipated impacts are anticipated due to indoor locations.

Eastern Island tours.

Impacts may also be associated with the increased number of boat landings on the island. Boat landings (boat and people noise) may occasionally disturb resting endangered Hawaiian monk seals and threatened green sea turtles on Eastern Island beaches as well as those that are prospecting safe haul out locations (Kenyon 1972). All trips to Eastern Island will be closely supervised by FWS-approved staff and/or guides. Visitor tours of Eastern Island will be offered no more than once a week, unless specifically authorized by the refuge manager, and generally will be completed within a 3-hour period. Boats will tether to either side at the ocean end of the 150-foot pier, and disembarking passengers will be briefed on proper behavior to minimize disturbance to Hawaiian monk seals or green sea turtles that may be present.

Launching boats down the Sand Island boat ramp could disturb seals that often haul out and rest there.

Methods to reduce adverse effects

- All onsite EE will be closely supervised by FWS-approved staff and/or guides, as well as by accompanying teachers.
- All students will be subject to the same restrictions (e.g., beach closures, distances from monk seals, etc.) as other visitors.
- All guided Sand Island tours will be led by FWS-approved staff and/or guides and will be adjusted on the spot to avoid disturbance of seals and turtles.
- No more than 25 people will be led at one time on guided walks and bicycle tours.
- All visitors will attend an orientation before or upon arrival (immediately, or within 12 hours for extremely late arrivals) and be given appropriate narrative and graphic material to clearly indicate which areas are open for visitor use and to clarify regulations in force to protect wildlife and habitat. Cruise ship visitors receive an orientation from a FWS-approved staff and/or guide onboard ship or by handouts specific to their visit to Midway Atoll.
- Signing along self-guided trails will identify approved areas for beach access, wildlife observation, *etc.* FWS-approved staff and/or guides will monitor visitor use to assess and respond to incidents of noncompliance with refuge regulations. Vegetative screening will be used to ensure that visitors do not walk off trails.
- Interpreters will clearly explain the rationale for access restrictions and the actions that will be taken to enforce regulations.
- The frequency, duration, and route of guided Eastern Island tours will be modified, as needed, to avoid disturbance to seals and turtles.

- Boats will not be launched on the Sand Island ramp if an injured seal or pup is present or if a seal is in the middle of the ramp.
- Cruise ships will be given a specific location for safe anchorage outside the channel entrance. FWS personnel will work with NOAA to identify the best location for this anchorage prior to the first cruise ship arrival under the new monument regulations. Shuttle boats will be instructed to drive 10 km/h or less in the Inner Harbor and watch for turtles and seals.
- Cruise ships will be prohibited from discharging of any gray or black water during their anchorage period and for the entire period they are within monument waters. They will be advised of this requirement during event planning and reminded again just prior to arrival. Any detected violation of this requirement may be cause for barring of this cruise line from any future stops at Midway Atoll NWR and will be pursued as a violation of refuge regulations. Refuge staff will seek assistance from NOAA to use currently available sonar or other technology to assess the suitability for anchoring cruise ships 1.5 miles (2.4 km) south of the atoll entrance and in approximately 250 feet (76.2 m, 41.6 fathoms) (Fig. 7). This proposed site occurs outside Hawaiian monk seal critical habitat which extends out to a depth of 20 fathoms (120 feet, 36.6 m). A site will be chosen that will not negatively impact live coral and foraging areas for seals and turtles. The site determined to be suitable will be marked by GPS and transmitted to visiting ships. Cruise ship tenders will also be advised that due to possible impacts to monk seals and sea turtles, the speed limit within the harbor is 18.5 km/h (10 knots or 12 mph). FWS will request that cruise ships record in writing and with photographs all sightings of sea turtles and marine mammals while inside the monument.
- Due to concern over the introduction of invasive marine species into Midway Atoll and the monument, all cruise ships and sailboats must meet the hull inspection and all other requirements of Presidential Proclamation 8031. In addition, these vessels must comply with all other conditions specified in their monument permits.
- The last comprehensive marine alien species survey occurred in 1999 (FWS 1999). It is recommended that future marine alien species surveys take place every 5 years. If new alien species are discovered, FWS will immediately bring out a invasive species Invasive Species Strike Team to control and or eradicate these species.

4) Airport operation (for nonadministrative purposes)

Description of Use(s):

Although not a specific refuge purpose, Midway Atoll has been charged by Congress with the continued operation of Henderson Airfield for use as a Part 139 airport for twin-engine jets flying over the Pacific. In cooperation with the FAA, FWS, through its contractor, operates Henderson Airfield to meet appropriate Part 139 Standards.

Modern large passenger airplanes are extremely safe and reliable so use of Henderson Airfield for this purpose is very rare. In fact, in the past 3 years only one large passenger airliner has landed at Midway due to an in-flight emergency. However, many other aircraft use Henderson Airfield on a regular basis. Non-refuge administrative/management flights that would be covered by this use include FAA required navigational aid flight checks, flights by other agencies that have business or equipment on Midway, and visitor program flights. For the period of this plan (less than 5 years), non-administrative flights are estimated at 50 per year. This is a maximum figure based on 4 visitor flights per month for 9 months and 14 other agency flights.

Use also includes operation of a fuel truck to fuel a limited number of non-FWS related aircraft. At the present time this includes the U.S. Coast Guard but not general transient aircraft as FWS has issued a Notice to Airmen that fuel sales at Midway have been discontinued.

Anticipated Impacts of the Use(s):

Seals located at Frigate Point have been observed to lift their heads and look up when airplanes fly over just before landing or take off. The seals return to their previous behavior (mostly resting) within minutes (FWS unpub. data). This effect seems minimal and would be difficult to eliminate. No other species listed above are affected.

Methods to reduce adverse effects

- Maintain and enhance native vegetation along the ocean side of the runways to shield seals and turtles from airport activity.

5) Nonwildlife-dependent beach use

Description of Use(s):

Midway Atoll NWR residents and visitors use North Beach for nonwildlife-dependent beach activities such as sunbathing and swimming. Although all of North Beach is open for visitor use, most activities occur in the small area between Captain Brooks and the Clipper House. The entire North Beach is open as a "trail" for wildlife observation and receives use from refuge residents and visitors. Impacts to refuge resources under that use are covered in the Wildlife Observation Compatibility Determination.

A small number (6) of heavy, plastic lounge chairs will be set out for visitor use. This type of solid chair with no openings has been in use on North Beach for nearly 10 years and has caused no negative impacts on nearby seabirds or monk seals. Visitors and residents typically spend only a small part of a day on the beach (less than 1 hour), usually to relax and swim during the afternoon. Swimming is typically of short duration and is restricted to areas close to shore. In the interest of public safety, a pole with a throw line and life saving ring are mounted in the center of this use area. Beach users will be advised that swimming will be allowed from ½ hour after sunrise until ½ hour before sunset. Sunrise/sunset tables will be posted in the Captain Brooks beach facility.

Anticipated Impacts of the Use(s):

Minimal to no negative impacts to refuge resources are expected from this activity. Visitors could displace resting monk seals from preferred beach areas if refuge visitor guidelines regarding beach use are not followed. Sea turtles have not been seen on North Beach, but should one choose to haul out there, the standard 150-foot viewing distance would be required.

Methods to reduce adverse effects

- As part of their orientation, visitors will receive information on how to avoid disturbance to wildlife, especially Hawaiian monk seals and green sea turtles, and how to recognize behavioral indicators of disturbance.
- Beach areas occupied by resting monk seals will be signed with small portable seal shaped placards placed 150 feet from the seals to advise visitors of the seals' presence so they do not inadvertently cause disturbance.
- Swimmers will be advised to leave the water if a monk seal or sea turtle approaches them in the water.
- Beach users will be advised how to respond if approached on the beach by a monk seal or sea turtle.

6) Nonwildlife-related sports

Description of Use(s):

Several forms of nonwildlife-dependent recreation will be permitted at Midway Atoll for visitors and residents. Permitted outdoor recreation will include bicycling, jogging, volleyball, and tennis. Most sports will continue to be concentrated within the most developed areas of Sand Island. Volleyball will be allowed only in the designated sand court area adjacent to the Captain Brooks facility. Jogging and exercise bicycling will be restricted to hard surface roads in the town and industrial/historical area of Sand Island during daylight hours only (sunrise to sunset) to avoid wildlife collisions and promote safety. The tennis court is located on concrete under the roofline of the airport hangar.

Anticipated Impacts of the Use(s):

These activities will present little or no impact to listed species. Swimmers could accidentally swim close to monk seals and turtles. The volleyball court area is at the extreme edge of the typical beach use area by monk seals (300 feet (100 m) from the water's edge) so direct or even indirect impacts to seals from volleyball in this location is unlikely. No sea turtles have been observed on North Beach.

Methods to reduce adverse effects

- Closed areas will be posted and regulations strictly enforced. Residents and visitors will be informed about closed area restrictions through orientation sessions and posted notices.
- Exercise bicycling and jogging will be limited to paved and gravel roads and trails during daylight hours only (sunrise to sunset).
- A 150-foot approach restriction for seals and turtles will be strictly enforced. If a seal moved to within this distance of the volleyball court, the area would not be used (or the game stopped) until the seal voluntarily left the area.
- Lights at the volleyball court will not be turned on at night if disturbance is documented to occur to sea turtles (and their nestlings) and monk seals along with seabirds which are addressed separately in the Intra-agency Biological Evaluation Form (FWS 2006c).

7) Amateur radio operation

Description of Use(s):

Midway Atoll NWR receives occasional requests from amateur radio enthusiasts for permission to travel to the refuge for the purpose of broadcasting. Amateur radio operators use radio transmitters and receivers to communicate with other amateur radio operators as a hobby. The demand for this use at Midway Atoll NWR stems from a list of geographic locations which are designated as "countries." It is an objective of these amateur radio enthusiasts to receive and/or transmit from these "countries" and certain remote, uninhabited, or otherwise difficult to reach sites become desirable sites from which to broadcast and receive due to the rarity of transmissions from those sites.

At Midway, amateur radio operators are able to set up and transmit from inside existing buildings. In the past, the airport hangar has been used for this purpose. In most cases, the operators would set up temporary antennas for transmission, usually on the roof of the building. Newer technology allows transmissions with smaller antennae (typically less than 30 feet) than previously possible. Since the goal of the individual or group is to maximize transmissions, the station is normally operated 24 hours a day during the visit period. These visitors are primarily

interested in operating their radios, but their proximity to Midway's wildlife ensures they also spend time observing and learning about our nesting seabirds and marine life.

Anticipated Impacts of the Use(s):

Amateur radio operation will not occur on the beaches or in the marine environment, so no species listed in this document should be affected.

VII. Cumulative Affects Analysis

After reviewing each of 7 proposed activities one by one, the methods proposed to reduce adverse affects are appropriate for individual activities over a short (1-year) time frame.

It becomes increasingly difficult to assess the cumulative effects of these activities when analyzed together over a longer time period (> 5 years). For example, during the first year of the visitor program, seals may continue to pup at beaches on Sand Island and tolerate disturbances from a mix of all 7 proposed activities because they have already pupped at that particular location that year and have no choice but to remain. Over several seasons of disturbance, the seals may decide to no longer pup on Sand Island. Other cumulative effects may include trail erosion, coral reef degradation, animal stress and behavior changes, and invasive species introductions causing loss of native biodiversity and quality native habitat (Wallace 1994, Farrell and Marion 2002).

The solution is to regularly evaluate (weekly, monthly, and annually) visitor program activities and implement adaptive management as described below. It will also be important to continually learn from other visitor programs in similar environments such as the Galapagos Islands and implement appropriate management before cumulative affects become significant.

VIII. Adaptive Management

In order to implement adaptive management to limit disturbance of threatened and endangered species on the refuge and their habitats, especially critical habitat for Hawaiian monk seals, the Midway Atoll refuge manager will meet with refuge rangers and approved guides on a weekly basis during the 9-month visitor season. All data forms will be reviewed to assess impacts and the refuge manager will have the ability to direct positive changes to visitor activities when appropriate to most effectively manage listed species and their habitat.

In addition, a Midway Atoll NWR Wildlife Monitoring Work Group (MAWMWG) will be formed to assess impacts to listed species and their habitat. The group should be prepared to function as an unbiased biologically oriented entity with the underlying theme of "Wildlife First." This group could function according to recommendations advocated by Farrell and Marion (2002) who proposed a decisionmaking framework for protected areas in Chile, Costa Rica, Belize, and Mexico to manage visitor-related impacts. MAWMWG would (at a minimum) be composed of the Midway refuge manager and wildlife biologist, NOAA-Fisheries Hawaiian monk seal manager and wildlife biologist, NOAA-Fisheries sea turtle manager and wildlife biologist, and the State of Hawaii Kure Atoll manager and wildlife biologist. The group should

be in contact monthly by phone or email to discuss any visitor impacts and appropriate action. At least every 12 months the group would meet in person and present their findings to the Papahānaumokuākea Marine National Monument managers. The monument management board will make their report available to the public.

Adaptive Management Triggers and Responses:

One of MAWMWG’s initial tasks will be to refine the following draft list of management triggers and responses as a means of addressing negative impacts to species in an expedient manner.

| TRIGGER | RESPONSE |
|--|--|
| New invasive species found on refuge. | Invasive Species Strike Team travels to Midway as soon as possible to control or eradicate the species. |
| A visitor services program boat is responsible for death of a listed species. | Visitor boating activities will be suspended until appropriate management can be implemented. |
| Monk seal pupping no longer occurs on Sand Island. | Increase watchable wildlife distance for monk seals. Close West Beach to Kayaking. Close Rusty Bucket Area. |
| Sea turtle use at Turtle Beach declines by 25% or more from the long-term average. | Increase watchable wildlife distance for sea turtles. |
| Monk seal use of Reef Hotel declines by 25% or more from the long-term average. | Visitor snorkeling at Reef Hotel will be discontinued. |
| Obvious significant coral damage occurs at Reef Hotel from visitor snorkelers. | Visitor snorkeling at Reef Hotel will be discontinued. |
| Seals and turtles are regularly disturbed and flee into the water when boats transporting visitors tie up at the pier on Eastern Island. | Establish and be prepared to use an alternative beach landing site to offload visitors when seals and turtles are present at the pier. |
| Noncompliance with refuge regulations (purposefully going into closed areas or approaching monk seals, turtles, and dolphins). | Depending on the severity of the offense, visitors and residents will be warned and/or fined. |

IX. Public Review and Comment:

The Draft Interim Visitor Services Plan was issued for public review and comment from the period of December 8, 2006, through February 6, 2007. The plan and associated compatibility determinations were made available through printed copies upon request and through the FWS Website at <http://www.fws.gov/midway>. This level of review and comment was selected to meet FWS requirements under the National Wildlife Refuge System Administration Act of 1966, as amended.

A total of 6,282 letters (by letter, e-mail, or telephone call) were received by FWS in response to our request for comments on the Draft Interim Visitor Services Plan for Midway Atoll. This large response to the draft plan reflects the significant interest in the Papahānaumokuākea Marine National Monument, which was established during development of this plan.

In general, most commenters expressed support for operating a small-scale visitor program on Midway Atoll, however, many expressed concern about the potential impacts of those visitors on Papahānaumokuākea Marine National Monument resources. Several commenters expressed support for the visitor program outlined in the Draft Interim Visitor Services Plan, stating that a well-managed visitor program can be compatible with wildlife protection.

A few comments opposed provisions within Presidential Proclamation 8031, particularly to those requirements that preclude sport fishing at Midway Atoll. The monument co-trustees must implement the requirements contained within the Proclamation and have no authority to alter them. Some commenters expressed confusion about the multiple jurisdictions within the monument.

Many comments were received that did not apply to the Draft Interim Visitor Services Plan, but rather to the broader-scale Papahānaumokuākea Marine National Monument Management Plan. That plan is now under development and will address such issues as wilderness designation, habitat management, designation of historic resources, infrastructure development and maintenance at Midway Atoll, special ocean uses outside the Midway Atoll Special Management Area, and subsistence fishing. The monument management plan will incorporate the requirements of a national wildlife refuge comprehensive conservation plan, which normally would have been approved before development of a visitor services plan. For that reason, this document is an interim plan that may be modified during or after the development of the monument management plan.

Many commenters requested greater public involvement in monument management planning, monument permitting, and development of the visitor services plan. The first two topics are outside the purview of the visitor services plan and will be addressed in the monument management plan.

Specific visitor services-related issues raised include:

- visitor services plan development
- enforcement of rules
- permitting
- human safety
- staffing
- visitor carrying capacity
- independent visitors
- introduction of invasive species
- visitor orientation
- visitor impacts on wildlife
- interpretation

- snorkeling and diving
- kayaking
- trails
- volunteers
- use of amateur radios
- means of transportation
- adequacy of funding to implement the program
- costs to the visitor
- miscellaneous comments.

This biological evaluation was revised in May 2007 to address those pertinent comments that applied to endangered and threatened marine species.

X. Lists of Figures

Figure 1. Sand, Eastern, and Spit islands within Midway Atoll NWR.

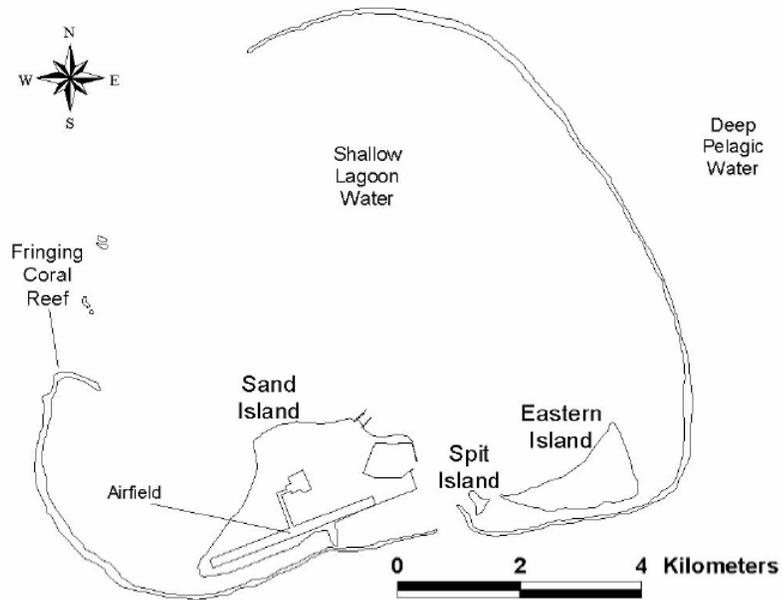


Figure 2. Green sea turtle habitat use at Midway Atoll (FWS unpub. data).

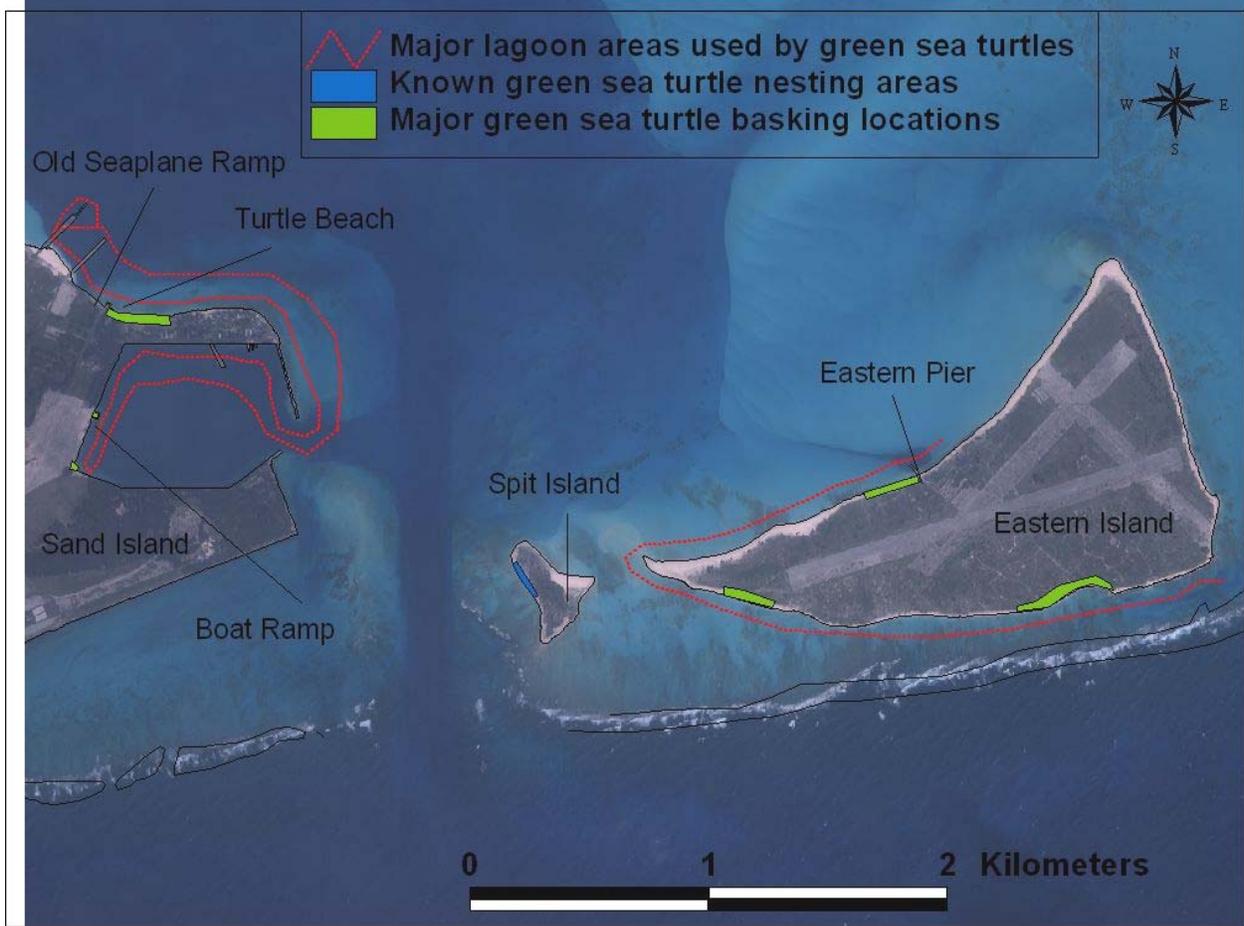


Figure 3. Major Hawaiian monk seal pupping and haul out areas at Midway Atoll NWR (compiled from FWS unpub. data, NOAA-Fisheries unpub. data from 2002 – 2007, and Johanos and Baker 2005). Major lagoon areas used by seals around Sand, Eastern, and Spit Islands are included. Data have been limited on lagoon and pelagic areas used by seals until the recent deployment of satellite tags on 6, 1-year-old females (Fig. 5).

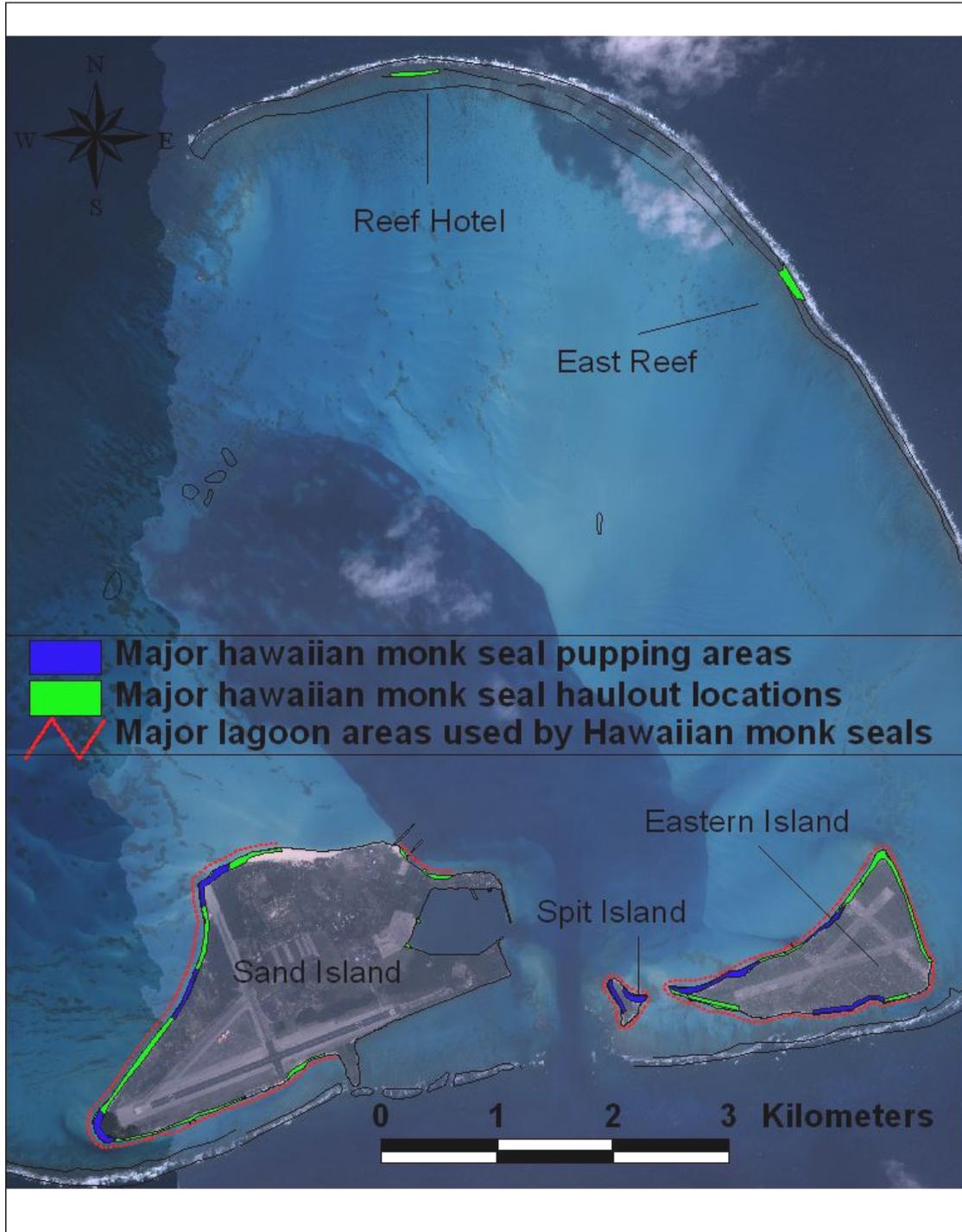


Figure 4. Hawaiian monk seal births at Midway Atoll from 1981 to 2006 (NOAA-Fisheries unpub. data).

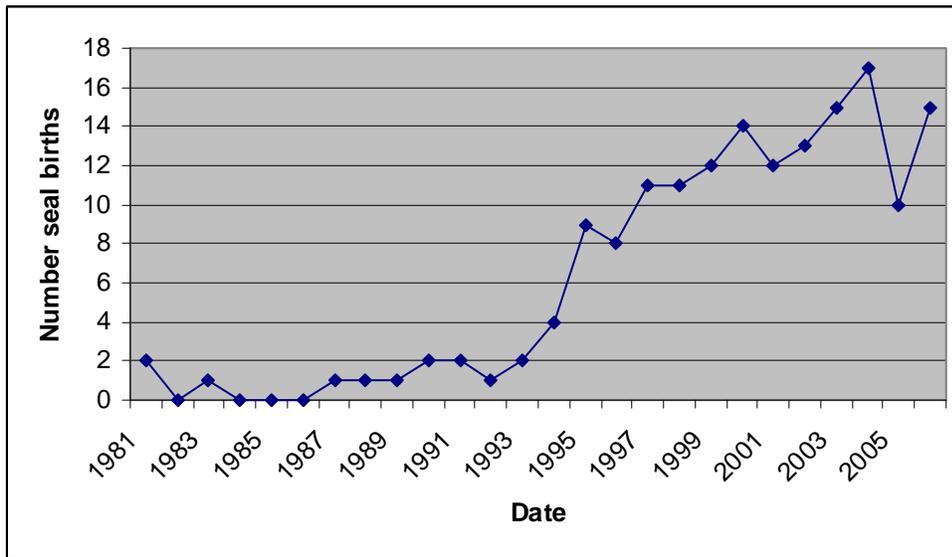


Figure 5. Hawaiian monk seal habitat use at Midway Atoll from 6 satellite tagged 1-year-old females (PO48, PO22, PO26, PO40, PO42, PO46) (April 18 – 27, 2007) (NOAA-Fisheries 2007). The monk seals were held in captivity at Midway Atoll from October 2006 to April 2007 and fed to increase their weight and hopefully their chances of survival in the wild after release.

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Figure 6. Occurrence, movements, and area use by Hawaiian spinner dolphins at Midway Atoll (courtesy of Dr. Leszek Karczmarkski).

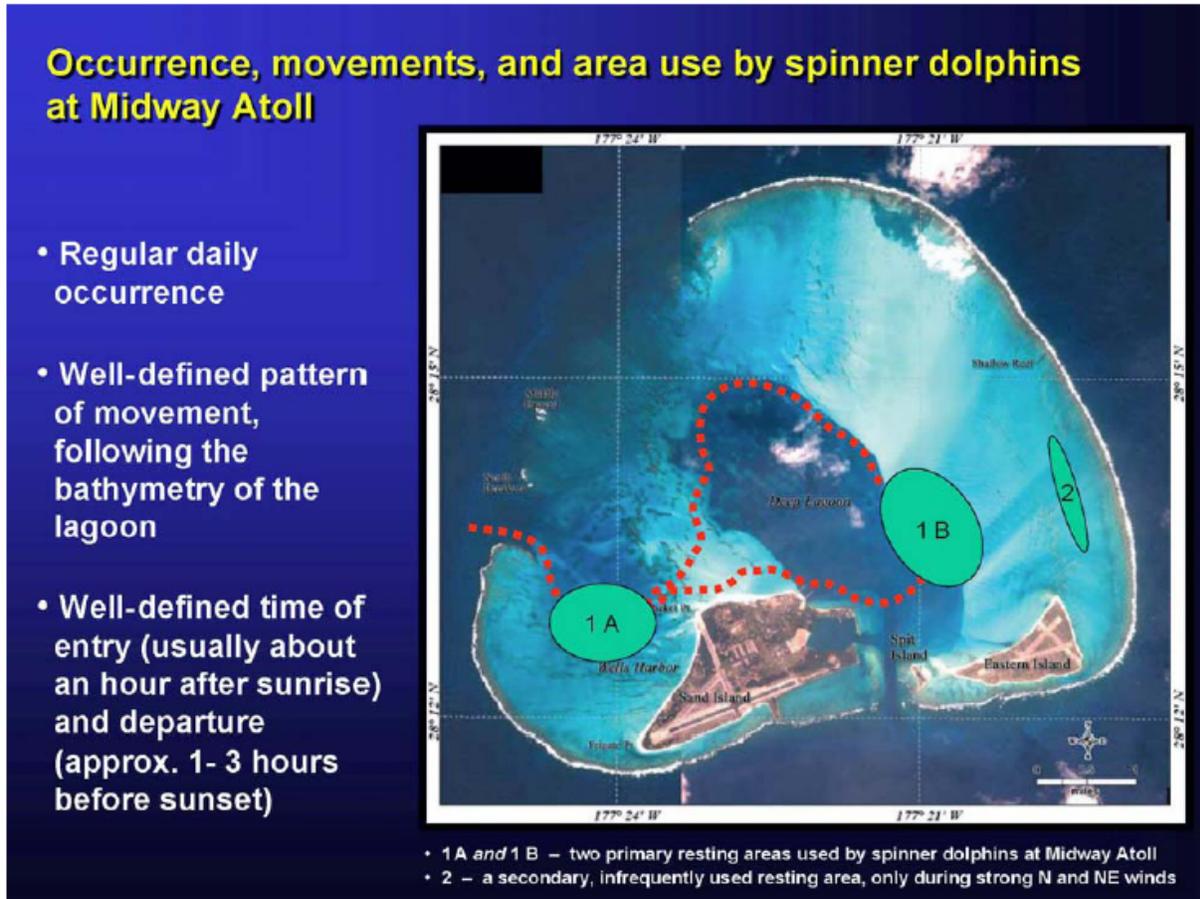
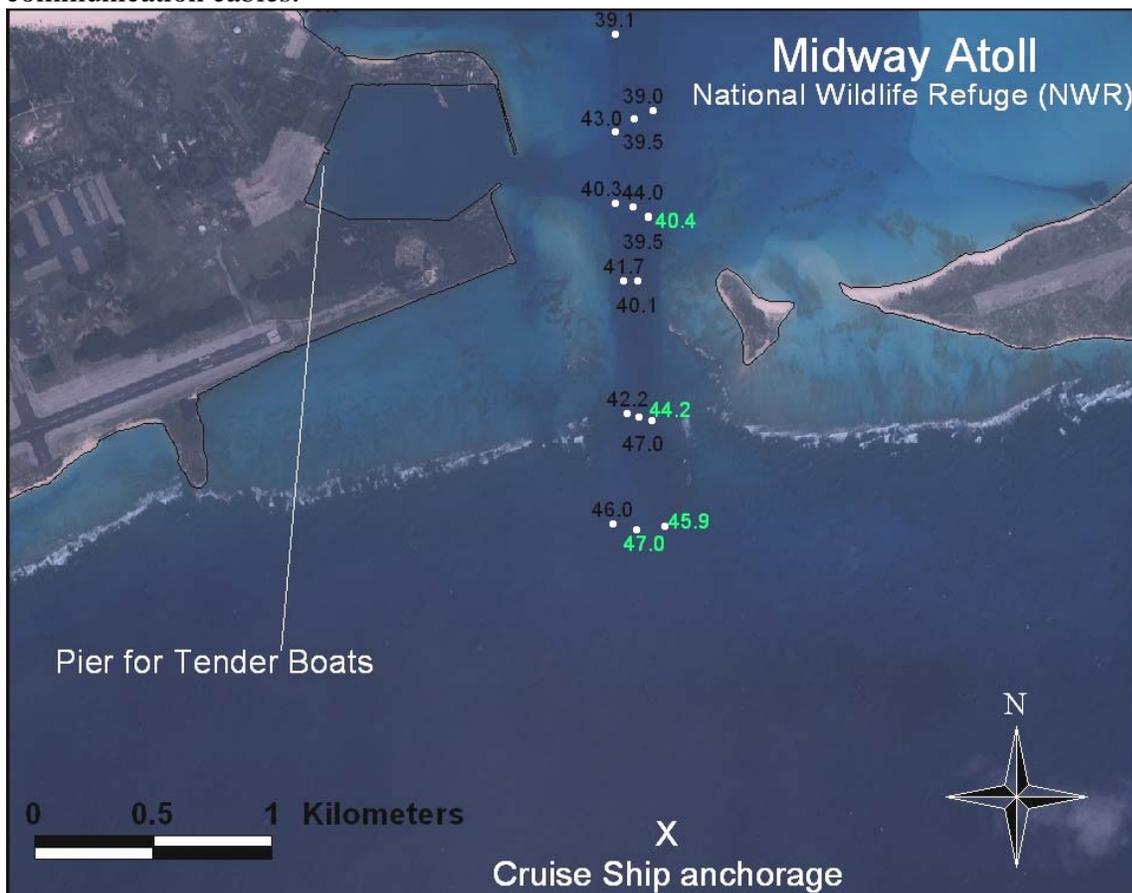


Figure 7. Proposed anchorage location for visiting cruise ships. The numbers shown on the map are channel soundings measured in feet. The proposed anchorage point is approximately 250 feet deep and 1.5 miles from the entrance to the atoll. The site is approximately 0.8 km (0.5 miles) from a previously used underwater Navy dumping ground and old submerged communication cables.



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XII. Appendices

Appendix 1. Hawaiian monk seal census form for recording monk seal observations at Midway Atoll NWR (Johanos and Ragen 1999).

117
SEAL CENSUS FORM

ENTERED

DATA TYPE _____ COMPUTER PAGE NO. PAGE _____ OF _____

ISLAND _____ OBSERVER TIME BEGIN END

DATE _____ NUMBER _____ TEMP. WIND CLOUD Prec.

| Line No. Continues | Time | Sector | Size | Sex | Beach Pos | Condition | ID | | TAG | | | MOLT | | Disturb | ASSOCIATION | | | Notes | Notes | EVENT | | |
|-----------------------|------|--------|------|-----|-----------|-----------|-----|---|-----|-----|-----|------|---|---------|-------------|----------|------|-------|-------|----------|------|-------|
| | | | | | | | No. | ? | No. | L/R | Col | ? | % | | ? | Line No. | Dist | | | Behavior | Type | Codes |
| 1 | | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | | | | |

NOTES:

Appendix 2. Directions for monk seal census form (Johanos and Ragen 1999). Information such as type of activity, number of visitors, duration and location of the activity, will be recorded in the notes section of the form.

1996
CENSUS FORM DIRECTIONS

DATA TYPE

C = Census: A complete, timed count on an island begun around 1300. Census is conducted as quickly as possible (while gathering all information).

A = Atoll-wide census (must be completed within 2 days)

B = Behavior patrol: A complete, untimed count where size, sex, ID, and disturbance are recorded. Associations are coded if they involve adult or subadult seals (Laysan and Lisianski Islands only in 1996).

P = Patrol: A complete, untimed count where size, sex, ID, and disturbance are recorded.

I = Incidental observ. (limit these, FWS data, etc).

T = Tag status entry for non-active tags (tags not currently on a seal). Record tag status in notes columns.)

COMPUTER PAGE NO. Leave this blank during data collection. It will be assigned and displayed on the screen when you enter the data. At that time, be sure to fill in the computer page number on your census form, as this number is needed for data retrieval.

PAGE Page number within a census or patrol. For example, if the census (or patrol) requires three pages, then mark the first page as "page 1 of 3" and so on. If more than one person conducts the census, then combine page numbers; person A has pages 1 and 2, while person B has pages 3 and 4 of a four-page census day.

ISLAND Name of island and atoll, e.g., East, FFS

OBSERVER Three initials. If no middle initial, use the first and last block.

TIME BEGIN and END On a 24-hour clock, e.g., 6 p.m. = 1800, for the group of pages.

DATE The date that data are collected (in YYYYMMDD format).

NUMBER Censuses, Atoll counts, Behavior patrols, and Patrols must be numbered. Each data type will have its own three-digit number series, starting with 001.

TEMP. Temperature in degrees Celsius at beginning of census or patrol.

WIND Speed: 0 = no wind, calm (<5 knots)
1 = light breeze (5-15 knots)
2 = strong wind (>15 knots)

Direction: NN, NE, EE, SE, SS, SW, WW, NW
Thus, 2 N N = strong wind from north

CLOUD Cloud cover: 00 = no clouds
01-09 = 10 to 90% cover
10 = 100% cover

PREC. Precipitation: 0 = no precipitation or trace
1 = mist/drizzle
2 = rain
3 = intermittent rain

CONTINUE If the same seal sighting is recorded on several lines for any reason (e.g., additional tag or association, behavior at a later

time, change of beach position), put the original line number you are continuing from here. Lines may be continued only within the same page. All fields from SECTOR through MOLT will be copied from the original line if left blank on the continuation line. Several lines can have the same continuation line number.

TIME The time should be recorded for each seal sighting, on a 24-hour clock

SECTOR Location on island (e.g., 1-20 on Laysan)
Special codes as follows:
00 = unknown sector
77 = pen
88 = offshore spit
99 = island not present

SIZE Size is estimated using a classification scheme from Stone (1984), using the following terminology:

Juvenile Sort, slight seals from the length of a weaned pup (about 138 cm) to 20-30 cm longer, including yearlings, and perhaps younger seals, up to perhaps 3 years. Distinguished from pups by thinness and pelage color.

Subadults Seals perceptibly longer than juveniles up to breeding size; less robust than adults, generally with lighter pelage. Immature seals likely from 3 or 4 to 5 or 6 years.

Adult Reproductively active or breeding size seals at least as long as known breeders. Mature or probably mature seals. Adult females often have extensive back scars or wounds; adult males usually dark, including venter, and extensively scarred.

Code size as follows

Nursing pups

P = Nursing pup
P1 = Nursing pup, wrinkles
P2 = Nursing pup, no wrinkles
P3 = Nursing pup, blimp, black
P4 = Nursing pup, molting
P5 = Nursing pup, molted
PW = Prematurely weaned/undersized weaned pup (weaned ≤ 2 wks ago and < 90 cm girth)
W = Weaned pup

Immatures

I = Immature
J = Juvenile
J1 = Juvenile I
J2 = Juvenile II
S = Subadult
S3 = Subadult III
S4 = Subadult IV

Adults

A = Adult

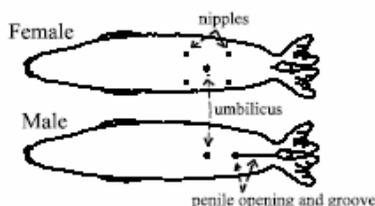
Unknowns

U = Seal of unknown size

Turtles

T = Turtle
 T1 = Turtle, juvenile (<65 cm)
 T2 = Turtle, subadult (65-80 cm)
 T3 = Turtle, adult (>80 cm)

SEX M = Male
 F = Female
 U = Unknown



BEACH POS. Location of seal or turtle when observer comes abreast of animal (e.g., if seal is seen in the water from a distance and yet is on the beach when the observer comes abreast, the seal is recorded as being on the beach). When recording male-male interactions (at Laysan and Lisianski Islands in 1996), make a continuation line previous to the original line to indicate that the seal changed beach position before you come abreast of it.

0 = animal floating or swimming in water (not included in census tally but may be used for behavioral data or other analysis)
 1 = on the beach
 9 = on an offshore rock (not included in census tally)
 X = data not taken

CONDITION It is assumed that condition is recorded for all seals (except nursing pups) on census or atoll count. Always record the condition of the mom and pup on their first sighting post-partum and post-weaning, regardless of data type. Always note condition when recording a survival factor.

Condition codes:

M = medium
 P = probably pregnant
 F = fat
 T = thin
 X = data not taken
 If the condition code is left blank, condition is assumed to be medium.

ID DATA These fields can be used to record either a temporary or permanent ID number. Use continuation lines to record both a temporary and permanent number, or two temporary numbers.

T/P Indicate whether the number in the subsequent field is a temporary or permanent ID number.

T = temporary ID number (or bleach number)
 P = permanent ID number

TEMPORARY ID NO. Record the temporary ID number (or bleach number) of seal if known; right justified. This field may be used for any temporary number. Use separate number series for bleach and various types of temporary numbers. If a number is incompletely read, use dashes as place-holders within the number to indicate missing digits (e.g., incompletely read bleach 152 may be coded -52, 1-2, or 15-).

? column:

- 0 = seal is definitely unmarked; can coexist with a temporary number, or with a bleach number if bleach hasn't taken yet or the number has molted off
- 1 = bleach is present, but the number is questionable
- 4 = partially read bleach number completed from other data
- 5 = incompletely read bleach number, but partial data are certain (if seal can't be identified by ID or Tag #)
- 6 = temporary number valid for this survey only, use for data types C, A, B, or P (for unident. cruisers moving ahead of you on census, etc.).
- blank = number is certain and complete if present

PERMANENT ID NO. Record the four-digit permanent ID number of seal if known (put both the island-specific prefix and next digit in the first box provided).

? column:

- 0 = seal is definitely not an IDed animal
- 1 = ID number is questionable
- blank = ID number is certain and complete if present

TAG NO. Tag number if known; right justified. If a number is incompletely read, use dashes as place-holders within the number to indicate missing digits. Put the alpha prefix of the temple tag (combined with tag ? column code = 5) if you can determine the hole drilling pattern, but can't decipher the number (e.g. A--RT5 for a right tan tag with a 1983 drill pattern). Record the last five digits of a 10-digit PIT tag (put all 10 digits in the notes).

L/R: Tag position

- L = tag on left flipper
- R = tag on right flipper
- B = tags on both flippers (enter one tag number)

COL:

Color code -see the Tag Sample Kit if unsure of the colors

| Temple tags | Other tag types |
|---|--------------------|
| Y = yellow (FFS) | M = metal, Monel |
| T = tan/brown (Laysan) | P = plastic, Riese |
| G = green (Lisianski) | C = clear, PIT tag |
| B = blue (Pearl & Hermes) | |
| K = silver/gray (Kure) | |
| R = red (Midway, Necker, Nihoa, Main Islands) | |

? column:

- 0 = seal is definitely not tagged
- 1 = seal is tagged, but the number is questionable
- 4 = partially read tag completed from other data
- 5 = incompletely read tag, but partial data are certain (if seal can't be identified by ID or Temporary #)
- 8 = Tag lost/unreadable. Fill out tag position (L/R) and the tag condition event with codes L or U. Complete the tag number and color from other data before entry.
- blank = tag information is certain if present. Partial data (either Tag #, position, or color not filled) are OK and will be completed by computer if the seal is identified by ID, Temporary #, or Tag #. The computer will only fill blank fields, so an incomplete Tag #

must be completed by hand (use a "4" in the tag ? column).

- MOLT** Percentage of old pelage lost, optional for nursing pups
- blank = no molting evident
 - 0-9 = 1 to 99% molted:
 - 0 = molting, but less than 10%; 1 = 10-19%; ... 9 = 90-99%. The first record of a ≥ 2 molt is considered the first day of true molt.
 - 10 = 100% molted, freshly molted, required for the first month after molt. Put both digits of the 10 in the single box provided.
- ? column:
- 0 = seal is definitely not molting
 - 1 = seal is molting, but % molt estimate is questionable. May or may not include an estimate in the molt column
- DISTURB** The degree to which the seal may have been disturbed by observer
- 0 = no disturbance, or seal merely raised its head or looked at observer - If column blank, 0 is assumed
 - 1 = seal vocalized, gestured, or moved ≤ 2 body lengths
 - 2 = seal alerted to observer and moved > 2 body lengths
 - 3 = seal alerted to observer and fled into water
- ASSOCIATION DATA** Use continuation lines to record more than one association. Don't record associations involving turtles. Record detailed association data at Laysan and Lisianski Islands in 1996. At other locations, record mother-pup pairs and unusual events. At all locations except Laysan and Lisianski Islands, the X code will be filled in by computer to indicate that standard association data was not recorded on Census or Atoll Count.
- Active associations
- 1) noted for all except behaviors between mother and nursing pup
 - 2) must take place within 30 m of observer
 - 3) subjects may be any distance apart
- Spatial associations
- 1) noted as observer comes abreast of the subject
 - 2) individual seals
 - mother-pup pair (N): any distance
 - all others (L): distances ≤ 10 m away, record two nearest neighbors in straight line of sight, can be on opposite sides of a log.
- LINE NO.** Identity of the other seal in the association. Put its line number here (note line number refers to within same census page only).
- DIST.** Closest distance during behavior
- 0 = body contact

- 1 = <2 m
- 2 = 2-5 m
- 3 = >5 m (>5 m but ≤ 10 m in the case of L behavior code)

BEHAVIOR Up to four behaviors may be recorded for each association, but N, X, and Q should not appear together with other behaviors. Behaviors B and M require distance = 0. With the exception of Chases, Jousts, and Mounts, only record repetitive, sequential behaviors once (for example, if an animal approaches three times in a row, code one A). If vocalizations occur, only code V once (whether or not they are sequential).

1) individual seal

a) active behavior

- A = approach/investigate/sniff/nudge
- B = bite
 - B1 = bite, nip
 - B2 = bite, draws blood/breaks skin
- C = chase
 - C1 = chase, ≤ 2 body lengths*
 - C2 = chase, > 2 body lengths*
- D = seal displaces another (see CONTEST RULES)*
- F = flee
 - F1 = flee/move away, ≤ 2 body lengths
 - F2 = flee/move away, > 2 body lengths move away
- J = joust
 - J1 = joust ≤ 30 s*
 - J2 = joust > 30 s* spar/fight*
- M = mount/attempted
 - M1 = mount/attempted mount ≤ 30 s
 - M2 = mount/attempted mount > 30 s
- P = play*
- R = submissive roll/present ventral
- V = vocalize
- Z = cruising. A/S4 male only behavior (actual sex may be unknown). Does not require a line number reference to another seal, but may have one)

b) spatial association

- N = mother-pup pair (any distance), does not imply actual nursing behavior. This is the only association recorded between mother-pup pairs.
- L = association by location only (distance ≤ 10 m apart, for all except mother-pup pairs)

c) optional codes

- L1 = pair assoc.* A/S4 male actively defends an adult female or immature of either sex (actual sex may be unknown), or establishes a pair relationship with a female or immature after displacing another male. Code the L1 relationship before and after contest if displacement occurs.
- Q = loser*
- W = winner*
- Y = tie*

Note: codes Q, W, and Y are used for A/S4 male-male contests only, although the actual sexes may be unknown (in which case record as though they were known to be males); see the attached CONTEST RULES.

* requires a corresponding code on the line of the associated seal

| Code | Corresponding code |
|----------------|--------------------|
| C, C1, C2..... | F, F1, or F2 |
| D..... | F, F1, or F2 |

J, J1, J2.....J, J1, and J2 respectively
P.....P
L1.....L1
Q.....W
W.....Q
Y.....Y

- 2) nothing nearby
O = no behavior or association
- 3) no data
X = no association data recorded on Census or Atoll Count

NOTES--There is room to code 2 different notes. Always use the first column first. Code an H if you have handwritten notes on the observation. Put handwritten notes on the bottom of the census form, labeled by line number. If more than two note codes apply, use continuation lines.

A = artwork (scars drawn)
B = birth, 1st sighting post-partum (mom and pup)
G = seal is green with algae
H = handwritten notes
M = marked, bleach number 1st applied/reapplied post-molt
W = weaning, 1st sighting postweaning (pup)
X = pup exchange, 1st sighting after exchange (mom and pup)
Y = disturbance is to "bystander" seal during non-survey activity such as tagging.

FOR DATA TYPE "T", STATUS OF NON-ACTIVE TAGS:
F = found
R = recovered from seal in hand

EVENT These columns are used to record a variety of data. The codes used will depend upon the type of event that you wish to record. Left justify your coding:

| TYPE | CODES COLUMN | CONTENT |
|---------------------|--------------|--|
| F = survival factor | | ONLY RECORD RESIGHT OF A SURVIVAL FACTOR AS AN EVENT IF THERE ARE IMPORTANT CHANGES TO DOCUMENT, SUCH AS A NEW WOUND, HEALING, DEATH, ETC. |
| | 1-3 | Survival Factor number |
| | 4 | Factor Type. If seal is dead, always record factor type "D" on ORIGINAL LINE. For mobbings/harassments, always code a census entry with factor type "M" for the victim at the beginning and end of the incident. Otherwise, you only need to record the most appropriate factor type if more than one applies. D = death W = wound E = entanglement V = very thin (emaciated) I = illness/abnormal M = mobbing/harassment O = other |
| | 5 | Participant type (for mobbings/ |

Additional notes:

1. All original monk seal data should be coded in pencil. Never erase data once you have left the recording site. Instead, cross errors out with a single line. Field editing is editing before running the data entry and checking program. All field editing by the data collector should be in blue, and field editing by others should be in red. As soon as you begin the entry and checking program, the computer will assign the computer page number and display it on the screen. At this point, be sure to fill it in on your census form. All editing after this point should be in orange. After completing the entry and checking program, check off and initial the ENTERED box on the census form.
2. A separate data sheet should be filled out for each date, observer, data type, and island within an atoll. If no seals are present, you should still fill out the information at the top of the census form and write "No seals" in the data area (only enter the header information). If the island itself is not present, indicate this by using 99 for the sector code, leaving the rest of the (first) line blank. To save paper, you should use a census form with multiple headers if you only have a few seals to record (i.e., at some islands within an atoll, or when recording incidental sightings before or after census or patrol). In essence, on a census form with multiple headers, each header and its associated lines represents a separate data sheet.
4. Weather information (except temperature) should be a summary of the entire day up until the end of the census or patrol, not merely an instantaneous observation.
6. Only code the sex as known if the ventral is seen or if the seal is the mother in a mother/pup pair, even if you "know" the sex because of the tag, bleach, scars, or behavior.
9. **Always record disturbance.** You must be honest about this! Fill out a census form to document disturbance if you disturb a seal when you are not otherwise collecting data. On a census or atoll count, it is also assumed that condition and molt data will be taken. At locations other than Laysan and Lisianski Islands, it is not assumed that association data will be taken on census or atoll count in 1996. Thus, on a census or atoll count sheet from these other locations, no code in any of the association columns means that data was not taken, and an X code will be filled in by computer. If you wish to indicate that a seal was alone, use the 0 behavior code. At Laysan and Lisianski Islands in 1996, it is assumed that behavioral data will be taken on census (and during behavior patrol). Thus, on a census or behavior patrol data sheet from Laysan or Lisianski Island, no code in any of the association columns means that the seal was alone, whereas on a regular patrol data sheet from the same location, no code may simply mean that no data were taken. It is not necessary to put an 0 code for each unassociated animal on census or during behavior patrol at these locations because it will be filled in by computer. If you are unable to record association data on a census or behavior patrol at Laysan or Lisianski Island for any reason, indicate this with an X for the behavior code.
13. Do not make up additional codes. If the need for an additional code arises, contact Honolulu.

XIII. Effect Determination and Response Requested: [* = optional]

A. Listed species/designated critical habitat:

| <u>Determination</u> | <u>Response requested</u> |
|---|---------------------------|
| no effect/no adverse modification (species: _____) | ___*Concurrence |
| may affect, but is not likely to adversely affect species/adversely modify critical habitat (species: threatened green sea turtle; endangered hawksbill sea turtle, endangered leatherback sea turtle threatened loggerhead sea turtle, endangered Hawaiian monk seal, endangered humpback whale, endangered sperm whale) | <u>X</u> Concurrence |
| may affect, and is likely to adversely affect species/adversely modify critical habitat (species: _____) | ___ Formal Consultation |

B. Proposed species/proposed critical habitat:

| <u>Determination</u> | <u>Response requested</u> |
|---|---------------------------|
| Not applicable | |
| no effect on proposed species/no adverse modification of proposed critical habitat (species: _____) | ___*Concurrence |
| is likely to jeopardize proposed species/ adversely modify proposed critical habitat (species: _____) | ___ Conference |

C. Candidate species:

| <u>Determination</u> | <u>Response requested</u> |
|---|---------------------------|
| Not applicable | |
| no effect (species: _____) | ___*Concurrence |
| is likely to jeopardize candidate species (species: _____) | ___ Conference |

Initiating Office:

Barry Christensen
Refuge Manager, Midway Atoll National Wildlife Refuge

May 21, 2007
Date

Barry W. Sleight
Project Leader, Hawaiian and Pacific Islands
National Wildlife Refuge Complex

5/21/2007
Date

Reviewing ESO Evaluation:

- A. Concurrence _____ Nonconcurrency _____
- B. Formal consultation required _____
- C. Conference required _____
- D. Informal conference required _____
- E. Remarks (attach additional pages as needed):

To be Completed

Pacific Islands Regional Office, NOAA-Fisheries

Date