

**Papahānaumokuākea Marine National Monument**  
RESEARCH Permit Application

**NOTE: *This Permit Application (and associated Instructions) are to propose activities to be conducted in the Papahānaumokuākea Marine National Monument. The Co-Trustees are required to determine that issuing the requested permit is compatible with the findings of Presidential Proclamation 8031. Within this Application, provide all information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Papahānaumokuākea Marine National Monument (Monument).***

**ADDITIONAL IMPORTANT INFORMATION:**

- Any or all of the information within this application may be posted to the Monument website informing the public on projects proposed to occur in the Monument.
- In addition to the permit application, the Applicant must either download the Monument Compliance Information Sheet from the Monument website OR request a hard copy from the Monument Permit Coordinator (contact information below). The Monument Compliance Information Sheet must be submitted to the Monument Permit Coordinator after initial application consultation.
- Issuance of a Monument permit is dependent upon the completion and review of the application and Compliance Information Sheet.

**INCOMPLETE APPLICATIONS WILL NOT BE CONSIDERED**

Send Permit Applications to:

Papahānaumokuākea Marine National Monument Permit Coordinator  
6600 Kalaniana'ole Hwy. # 300  
Honolulu, HI 96825  
nwhipermit@noaa.gov  
PHONE: (808) 397-2660      FAX: (808) 397-2662

**SUBMITTAL VIA ELECTRONIC MAIL IS PREFERRED BUT NOT REQUIRED. FOR ADDITIONAL SUBMITTAL INSTRUCTIONS, SEE THE LAST PAGE.**

## **Papahānaumokuākea Marine National Monument Permit Application Cover Sheet**

This Permit Application Cover Sheet is intended to provide summary information and status to the public on permit applications for activities proposed to be conducted in the Papahānaumokuākea Marine National Monument. While a permit application has been received, it has not been fully reviewed nor approved by the Monument Management Board to date. The Monument permit process also ensures that all environmental reviews are conducted prior to the issuance of a Monument permit.

### **Summary Information**

**Applicant Name:** Erin Oleson

**Affiliation:** NOAA NMFS PIFSC

**Permit Category:** Research

**Proposed Activity Dates:** August 2010

**Proposed Method of Entry (Vessel/Plane):** Vessel

**Proposed Locations:** Kure, Pearl & Hermes Reef, and Ladd Seamount

**Estimated number of individuals (including Applicant) to be covered under this permit:**

3

**Estimated number of days in the Monument:** 15

**Description of proposed activities:** (complete these sentences):

a.) The proposed activity would...  
provide a year-round measure of the occurrence and behavior of cetacean species within the Monument, including information on which species use Monument waters and for how long. At Pearl & Hermes Reef and at Kure, the proposed activity will also provide specific information on whether humpback and right whales use these waters as winter calving grounds.

b.) To accomplish this activity we would ....  
deploy one High-Frequency Acoustic Recording Package (HARP) for year-round monitoring at each of the proposed locations- Kure, Pearl & Hermes Reef, and Ladd Seamount.

c.) This activity would help the Monument by ...  
providing a cetacean species inventory, information on each species seasonal occurrence, and the role of each species in the Monument, thereby providing baseline biological information needed to manage cetacean species within Monument waters, particularly endangered baleen whale species and others that are impacted by commercial fishing outside the Monument (i.e. false killer whales).

**Other information or background:**

The spatial and temporal distribution of cetaceans in the Northwest Hawaiian Islands has only once been assessed, and as part of the large-scale HICEAS (Hawaiian Island Cetacean and Seabird Survey) survey in 2002. Very few track lines were surveyed within the Monument and none occurred close to shore. Very little information exists on cetacean occurrence or the population structure of cetaceans within Monument waters. With the exception of island-associated spinner dolphins at a few selected islands and atolls, no directed studies of cetaceans have occurred near the islands. Recent data have been collected demonstrating that humpback whales use the Northwest Hawaiian Islands, either as a breeding area or en route to breeding areas in the Main Hawaiian Islands (Johnston et al. 2007). Modeling studies of NWHI habitat also indicate that this region would be suitable for use as a breeding ground by critically endangered right whales (Johnston unpubl. data), though it has been nearly impossible to evaluate this because it is very difficult to conduct surveys during the winter. In addition, opportunistic sighting of other species, including false killer whales and beaked whales suggest that Monument waters support a diverse array of cetacean species.

Advancements in low-power and high-data-capacity consumer computer technology during the past decade have been adapted to autonomously record sounds from marine mammals over long periods. Acoustic monitoring has advantages over traditional visual surveys, including greater detection ranges, continuous long-term monitoring in remote locations under various weather conditions independent of daylight, and lower cost. However, until recently, the technology required to autonomously record whale sounds over long durations as been limited to low-frequency (< 1000 Hz) baleen whales. The need for a broader-band, higher-data capacity system capable of autonomously recording toothed whales and other marine mammals for long periods has prompted the development of a High-frequency Acoustic Recording Package (HARP) capable of sample rates up to 200 kHz. Currently, HARPs accumulate data at a rate of almost 2 TB per instrument deployment. HARPs are currently in use worldwide to acoustically monitor marine mammals for behavioral and ecological long-term studies.

## **Section A - Applicant Information**

### **1. Applicant**

Name (last, first, middle initial): Oleson, Erin M.

Title: Cetacean Research Program Leader

#### **1a. Intended field Principal Investigator (See instructions for more information):**

Chad Yoshinaga

#### **2. Mailing address (street/P.O. box, city, state, country, zip):**

[REDACTED]

[REDACTED]

Phone:

[REDACTED]

Fax:

[REDACTED]

Email:

[REDACTED]

For students, major professor's name, telephone and email address:

#### **3. Affiliation (institution/agency/organization directly related to the proposed project):**

NOAA, NMFS, Pacific Islands Fisheries Science Center, Protected Species Division

#### **4. Additional persons to be covered by permit. List all personnel roles and names (if known at time of application) here (e.g. John Doe, Research Diver; Jane Doe, Field Technician):**

TBN- HARP Technician

John Hildebrand, field logistic support, Scripps Institution of Oceanography

**Section B: Project Information**

**5a. Project location(s):**

<input type="checkbox"/> Nihoa Island	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> Necker Island (Mokumanamana)	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> French Frigate Shoals	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> Gardner Pinnacles	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> Maro Reef			
<input type="checkbox"/> Laysan Island	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> Lisianski Island, Neva Shoal	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Pearl and Hermes Atoll	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input checked="" type="checkbox"/> Deep water
<input type="checkbox"/> Midway Atoll	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Kure Atoll	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input checked="" type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Other			

**Ocean Based**

NOTE: There is a fee schedule for people visiting Midway Atoll National Wildlife Refuge via vessel and aircraft.

Location Description:

All HARPs will be deployed at depths of 500-1000m in region of relatively flat bathymetry if possible . Site at Pearl & Hermes will be ~ 10 nmi southwest of the atoll. Site at Kure is to be determined, but will probably be 5-10 nmi north of the atoll. Site at Ladd will be on the slope of the seamount.

**5b. Check all applicable regulated activities proposed to be conducted in the Monument:**

- Removing, moving, taking, harvesting, possessing, injuring, disturbing, or damaging any living or nonliving Monument resource
- Drilling into, dredging, or otherwise altering the submerged lands other than by anchoring a vessel; or constructing, placing, or abandoning any structure, material, or other matter on the submerged lands
- Anchoring a vessel
- Deserting a vessel aground, at anchor, or adrift
- Discharging or depositing any material or matter into the Monument
- Touching coral, living or dead
- Possessing fishing gear except when stowed and not available for immediate use during passage without interruption through the Monument
- Attracting any living Monument resource
- Sustenance fishing (Federal waters only, outside of Special Preservation Areas, Ecological Reserves and Special Management Areas)
- Subsistence fishing (State waters only)
- Swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area

**6 Purpose/Need/Scope *State purpose of proposed activities:***

Over 20 species of cetaceans inhabit the waters of the Hawaiian Archipelago, the majority of which are poorly studied, if studied at all, within the Northwestern Hawaiian Islands. This includes several species currently listed as endangered under the Endangered Species Act or as strategic stocks under the Marine Mammal Protection Act.

Surveys of cetaceans have occurred almost exclusively in and around the Main Hawaiian Islands, and a single NMFS large vessel cruise in 2002 remains the only comprehensive survey effort for pelagic cetaceans in the NWHI. An abbreviated cetacean research cruise during March/April 2007 in the Monument identified for the first time that humpback whales use significant portions of the shallow regions as wintering habitat.

**Purpose:** The primary purpose of the proposed work is to use passive acoustic recorders within offshore portions of the Monument to monitor the presence of cetaceans, ship traffic and fishing activities. These recorders, known as HARPs, have been used to provide detailed information on the seasonal and daily patterns of cetacean species, both within the Monument and at a number of diverse sites throughout the Pacific.

**Need:** This research is required to meet stock assessment mandates as set out under the U.S. MMPA, by which NMFS is responsible for conducting population assessments for each stock of cetaceans inhabiting the waters of the U.S. EEZ. This research will gather information on the long term patterns of presence and seasonality of cetaceans within the Monument through passive acoustics. These data will be integral for managing human effects on cetaceans within the Monument. Finally, due to the remote nature of the Monument, monitoring for unpermitted/unregulated ship and fishing vessel traffic will also occur.

**Scope:** The scope of the research includes the placement of one HARP to the southwest of Pearl & Hermes Reef and maintenance of that HARP twice per year. Additional HARPs may be deployed at Ladd Seamount, a site previously monitored using HARPs, and near Kure Atoll. A ship is required to deploy and recover the HARPs, but otherwise no other disturbance will occur during this research. We intend to piggy-back on existing and planned ship transits to accomplish this project.

**7. Answer the Findings below by providing information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Monument:**

The Findings are as follows:

a. How can the activity be conducted with adequate safeguards for the cultural, natural and historic resources and ecological integrity of the Monument?

A small anchor is used to moor the HARP in place. Two stacks of 175 lbs. of barbell weights, assembled onto a steel eyebolt and connected to approximately 4m of chain are all that will remain on the seafloor once the HARP has been removed.

b. How will the activity be conducted in a manner compatible with the management direction of this proclamation, considering the extent to which the conduct of the activity may diminish or enhance Monument cultural, natural and historic resources, qualities, and ecological integrity, any indirect, secondary, or cumulative effects of the activity, and the duration of such effects? The cetacean research proposed for this cruise will pose no threats to the ecological integrity of the Monument and can be conducted safely, for both humans and animals. Indeed, very little is known about the seasonality of cetaceans within the Monument, including endangered species such as blue whales, fin whales, sperm whales and north Pacific right whales. Research conducted in the Monument last season identified the presence of breeding humpbacks in Monument waters. This research will provide valuable information for the future management of human activities within the Monument and is consistent with Presidential Proclamation 8031 and the President's Ocean Action Plan.

c. Is there a practicable alternative to conducting the activity within the Monument? If not, explain why your activities must be conducted in the Monument.

NOAA must account for and assess each of the cetacean species within its jurisdiction, including assessment within the Monument. Vessel surveys may be conducted but are generally cost-prohibitive and therefore have occurred only once to date. Continuous acoustic monitoring provides a reliable method for detecting cetacean occurrence and providing a measure of relative abundance to other regions that are also monitored acoustically. Considering the lack of knowledge regarding cetaceans in the NWHI, and the current needs for remote vessel monitoring within the Monument, no practical alternatives exist for conducting this research outside of the Monument.

d. How does the end value of the activity outweigh its adverse impacts on Monument cultural, natural and historic resources, qualities, and ecological integrity?

Very little is known about cetacean occurrence near Monument islands and atolls, such that every period of acoustic monitoring provides additional information of what species occur in those areas and when they occur there, whether seasonally, year-round, or just sporadically. Acoustic monitoring will also provide much needed information on island-associated cetacean species within the Monument in order to inform future study on the movements and population-identity of those species. The proposed research will not occur in the vicinity of any known western or Native Hawaiian archaeological sites within the Monument, and thus is unlikely to impact any such resources.

e. Explain how the duration of the activity is no longer than necessary to achieve its stated purpose.

One year duration is the minimum needed to characterize basic patterns of cetacean seasonal occurrence within the Monument. We propose 2-3 year monitoring at each site in order to

capture the a greater portion of the natural variability in animal movements and oceanographic conditions. Monitoring for a shorter period may miss important events, such as the sporadic occurrence of endangered baleen whale species in the winter and spring, or the occasional use of island and atolls by pelagic species.

f. Provide information demonstrating that you are qualified to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.

The Chief Scientist and cetacean research PI (Oleson) is highly qualified to conduct and complete the proposed research activities. Dr. Oleson has significant expertise in long-term acoustic monitoring of cetacean occurrence (and has published several papers on these topics in the primary literature) and has acted as Chief Scientist or Cruise Leader on several NOAA cruises as well as on cruises conducted aboard research vessels run by academic institutions. The HARP deployments are fully funded and have been conducted successfully on previous occasions in locations inside and outside of the Monument.

g. Provide information demonstrating that you have adequate financial resources available to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.

The Cetacean Research Program has received approximately \$250,000 dedicated to the study of cetaceans within the Marine National Monuments in 2010. Only a portion of these funds are needed to support this study.

h. Explain how your methods and procedures are appropriate to achieve the proposed activity's goals in relation to their impacts to Monument cultural, natural and historic resources, qualities, and ecological integrity.

I. Has your vessel has been outfitted with a mobile transceiver unit approved by OLE and complies with the requirements of Presidential Proclamation 8031?

Yes, R/V Oscar Elton Sette will be used for this work.

j. Demonstrate that there are no other factors that would make the issuance of a permit for the activity inappropriate.

### **8. Procedures/Methods:**

High frequency acoustic recording package (HARP) deployment will occur approximately 10 miles south of Pearl & Hermes Reef in roughly 600m of water, at least 5 miles away from Kure Atoll (probably to the north) also at approximately 600m depth, and on the slope of Ladd Seamount at approximately 600m depth. These devices have an extremely high sampling rate (up to 200 kHz) along with large data storage capacity (over 1 terabyte of data storage) and an extremely long deployment life (over a year). The package will be deployed over the side of the ship. Communications with the HARP are conducted through an acoustic modem. The unit is recovered at the surface by triggering an acoustic release to drop ballast (barbell weights) and will be

recovered on a subsequent cruise. Recordings of cetacean sounds will be examined to provide details on when marine mammals are in the region, as well as assessing the effects of time of day and season on cetacean calling rates in the region. Analysis will be conducted with a variety of software packages designed for acoustic analysis (e.g. Raven from Cornell University) as well as MATLAB routines for automatically identifying species of cetaceans. The same instrument configuration and deployment logistics will be used at all sites.

**NOTE: If land or marine archeological activities are involved, contact the Monument Permit Coordinator at the address on the general application form before proceeding, as a customized application will be needed. For more information, contact the Monument office on the first page of this application.**

**9a. Collection of specimens - collecting activities (would apply to any activity): organisms or objects (List of species, if applicable, attach additional sheets if necessary):**

Common name:

No specimen collections will occur

Scientific name:

# & size of specimens:

Collection location:

Whole Organism  Partial Organism

**9b. What will be done with the specimens after the project has ended?**

**9c. Will the organisms be kept alive after collection?**  Yes  No

• General site/location for collections:

• Is it an open or closed system?  Open  Closed

• Is there an outfall?  Yes  No

• Will these organisms be housed with other organisms? If so, what are the other organisms?

- Will organisms be released?

**10. If applicable, how will the collected samples or specimens be transported out of the Monument?**

No specimens will be collected.

**11. Describe collaborative activities to share samples, reduce duplicative sampling, or duplicative research:**

Researchers at HIMB (Marc Lammers, Whitlow Au) are proposing deployment of Ecological Acoustic Recorders (EARs) for use in monitoring cetaceans and testing real-time vessel detection within the Monument. Deployment locations for EARs will be different than those proposed for HARPs in order to create a network of acoustic monitoring throughout the Monument.

**12a. List all specialized gear and materials to be used in this activity:**

HARPs are specialized acoustic recorders designed and built by Scripps Institution of Oceanography. They are capable of acoustic sampling at 200kHz sample rate with ample storage capacity and battery life to maintain a low duty-cycle (i.e. shorter periods of not recording) for one year, making them the most capable instrument for monitoring the full range of vocalization types by all anticipated cetacean species compared to other available instrument types.

**12b. List all Hazardous Materials you propose to take to and use within the Monument:**

No hazardous material will be used in this project.

**13. Describe any fixed installations and instrumentation proposed to be set in the Monument:**

HARPs will be anchored to the seafloor using a total of 350 lbs. of weight connected by acoustic release to the remainder of the mooring. At the time of mooring recovery, the release is triggered, and the weight is disconnected from the mooring allowing the recorder to return to the surface. Two stacks of barbell weights and approximately 4m of chain are left on the seafloor following the recovery of the HARP.

**14. Provide a time line for sample analysis, data analysis, write-up and publication of information:**

The HARP will record until spring 2011 at which time it will be recovered for placement of new disks and batteries, then redeployed until fall 2011. Data analysis generally takes 2-6 months depending on the number of cetacean detections within the data set. Publication of results would follow shortly after the data has been analyzed.

**15. List all Applicants' publications directly related to the proposed project:**

McDonald, Mark A., Hildebrand, John A., Wiggins, Sean M., Johnston, David W., Polovina, Jeffrey J. An acoustic survey of beaked whales at Cross Seamount near Hawaii. *J. Acous. Soc. Am.* Vol 125, No 2, 624-627. 2009.

Johnston, D. W., M. McDonald, J. Polovina, R. Domokos, S. Wiggins and J. Hildebrand. Temporal patterns in the acoustic signals of beaked whales at Cross Seamount. *Biology Letters*, 4:208-211. 2008.

Oleson, E.M., J. Calambokidis, W.C. Burgess, M.A. McDonald, C.A. LeDuc, and J.A. Hildebrand. Behavioral context of call production by eastern North Pacific blue whale. *Marine Ecology Progress Series*, 330 269-284. 2007.

Oleson, E.M., J. Calambokidis, J. Barlow, and J.A. Hildebrand. Blue Whale Visual and Acoustic Encounter Rates in the Southern California Bight. *Marine Mammal Science* 23: 574-597. 2007.

Oleson, Erin M., Sean M. Wiggins, John A Hildebrand. Temporal separation of blue whale call types on a southern California feeding ground. *Animal Behaviour* 74: 881-894. 2007.

Wiggins, S.M. and J.A. Hildebrand. High-frequency Acoustic Recording Package (HARP) for broad-band, long-term marine mammal monitoring. Pages 551-557, *International Symposium on Underwater Technology 2007 and International Workshop on Scientific Use of Submarine Cables & Related Technologies 2007*. Institute of Electrical and Electronics Engineers, Tokyo, Japan. 2007.

With knowledge of the penalties for false or incomplete statements, as provided by 18 U.S.C. 1001, and for perjury, as provided by 18 U.S.C. 1621, I hereby certify to the best of my abilities under penalty of perjury of that the information I have provided on this application form is true and correct. I agree that the Co-Trustees may post this application in its entirety on the Internet. I understand that the Co-Trustees will consider deleting all information that I have identified as “confidential” prior to posting the application.

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Signature

Date

**SEND ONE SIGNED APPLICATION VIA MAIL TO THE MONUMENT OFFICE  
BELOW:**

Papahānaumokuākea Marine National Monument Permit Coordinator  
6600 Kalaniana'ole Hwy. # 300  
Honolulu, HI 96825  
FAX: (808) 397-2662

**DID YOU INCLUDE THESE?**

- Applicant CV/Resume/Biography
- Intended field Principal Investigator CV/Resume/Biography
- Electronic and Hard Copy of Application with Signature
- Statement of information you wish to be kept confidential
- Material Safety Data Sheets for Hazardous Materials