

State of Hawai'i
DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Aquatic Resources
Honolulu, Hawai'i 96813

July 28, 2017

Board of Land and Natural Resources
Honolulu, Hawai'i

Request for Authorization and Approval to Issue a Papahānaumokuākea Marine National
Monument Research Permit to Dr. Carl Meyer, Hawai'i Institute of Marine Biology,
University of Hawai'i, for Access to State Waters to Conduct Research Activities to Quantify the
Movements and Ecology of Top Predators

The Division of Aquatic Resources (DAR) hereby submits a request for your authorization and approval for issuance of a Papahānaumokuākea Marine National Monument research permit to Applicant Dr. Carl Meyer, Hawai'i Institute of Marine Biology, University of Hawai'i, pursuant to § 187A-6, Hawai'i Revised Statutes (HRS), Chapter 13-60.5, Hawai'i Administrative Rules (HAR), and all other applicable laws and regulations.

The research permit, as described below, would allow entry and management activities to occur in Papahānaumokuākea Marine National Monument, including the NWHI State Marine Refuge and the waters (0-3 nautical miles) surrounding the following site:

- Nihoa Island
- Mokumanamana Island
- French Frigate Shoals
- Gardner Pinnacles
- Maro Reef
- Laysan Island
- Lisianski Island
- Pearl and Hermes Atoll
- Midway Atoll
- Kure Atoll

The activities covered under this permit would occur between August 1, 2017 thru July 31, 2018. The proposed activities are largely a continuation of work previously permitted and conducted in the Monument.

INTENDED ACTIVITIES

The applicant proposes to conduct renewal activities to study the foraging ecology, movement, and distribution patterns of top marine predators (shark and large fish species). Up to eight (8) individuals (including the applicant) would conduct proposed activities and access the Monument via a separately permitted vessel. For 2017, the applicant intends to conduct research activities during a research cruise aboard NOAA Ship HI'IALAKAI (separately permitted under

permit number PMNM-2017-002) for up to 30 days in September 2017. Proposed activity locations include marine areas within all Special Preservation Areas (SPAs) and the Midway Atoll Special Management Area.

Activities will be carried out from small boats launched from NOAA Ship HI'IALAKAI. Servicing of receivers will be done by snorkelers and SCUBA divers, and from small boats via an acoustic release system. This long-term monitoring method (remote acoustic monitoring) is ideal for quantifying animal movements in remote, environmentally-sensitive locations because it has minimal environmental impact and requires only occasional, brief access by researchers to individual study sites, yet provides continuous monitoring of animal movements at those sites.

Shallow (<30 m) receiver deployments: The applicant will continue to use a temporary receiver mooring system that has previously been empirically demonstrated to successfully withstand seasonal high surf. Moorings, installed by snorkelers or SCUBA divers will consist of sand screws in areas of soft sediment, and chain around uncolonized substrate in hard bottom areas (live substrates will be avoided). Personnel will completely remove these moorings when acoustic monitoring is completed (receivers will be in place for at least 2 years). The receivers will be anchored to the moorings and suspended 1-4 m above the ocean floor. The receivers will identify and record the presence of any acoustic transmitters within range (up to 500 m). The transmitter number, time of arrival and departure and the date will be recorded and stored until the data are downloaded from the receivers to a computer. The receivers have a battery life of approximately 15 months and will be serviced at 12 month intervals.

Deep (mesophotic >50m) receiver deployments: recover and redeploy 6 underwater receivers at existing mesophotic sites at Pearl and Hermes Reef and French Frigate Shoals atoll. Receivers will be attached to weighted (with concrete block) moorings, and dropped to the sea floor so that they land on the flat habitat. The moorings will incorporate an acoustic release to allow for surface recovery. Use of an acoustic release means the end weights and lower 30cm of the mooring (chain, polypro and twine) are sacrificial and will be left in situ when the receivers are recovered. As with shallow units, the mesophotic zone receivers will be suspended 4 m above the ocean floor and will be serviced at 12 month intervals.

Data retrieval, reduction and analysis: Personnel will download receivers currently deployed in Monument waters. Data downloading consists of interfacing the receiver to a computer via a wireless 'bluetooth' connection, and can be accomplished in the field. Preliminary data reduction and analyses will commence after downloading.

To safeguard Monument resources the applicant would abide by the following PMNM Best Management Practices (BMPs) while conducting the aforementioned activities within the PMNM: Best Management Practices for Boat Operations and Diving Activities (BMP #004); Marine Wildlife Viewing Guidelines (BMP #010); and Disease and Introduced Species Prevention Protocol for Permitted Activities in the Marine Environment (BMP #011).

The activity would provide empirical data on top predator's spawning habits, population sizes and movement patterns in the Monument. The applicant's proposed activities directly support the Monument Management Plan (MMP) Marine Conservation Science (MCS) Action Plan Strategy

MCS-1: Continue and enhance research, characterization and monitoring of marine ecosystems (PMNM MMP Vol. I, p. 122, 2008).

The activities described above may require the following regulated activities to occur in State waters:

- ☒ 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 submerged lands
- ☒ Discharging or depositing any material or matter into the Monument
- ☒ Possessing fishing gear except when stowed and not available for immediate use during passage without interruption through the Monument
- ☒ Attracting any living Monument resources
- ☒ Swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area

REVIEW PROCESS

The permit application was sent out for review and comment to the following scientific and cultural entities: Hawai'i Division of Aquatic Resources, Hawai'i Division of Forestry and Wildlife, Papahānaumokuākea Marine National Monument (NOAA/NOS), NOAA Pacific Islands Regional Office (NOAA-PIRO), United States Fish and Wildlife Service Hawaiian and Pacific Islands National Wildlife Refuge Complex Office, and the Office of Hawaiian Affairs (OHA). In addition, the permit application has been posted on the Monument Web site since February 15, 2017, giving the public an opportunity to comment. The application was posted within 40 days of its receipt, in accordance with the Monument's Public Notification Policy.

Comments received from the scientific community are summarized as follows:

QUESTIONS:

1. The permit applicant's proposed work seems to be compatible with the Monument's management goals. The applicant has adequately addressed all questions in the application, except for specifics on biosecurity safeguards. For example, if any gear has to be replaced, will they make certain that the new equipment is new and/or properly quarantined?

Yes. We will follow all existing PMNM Best Management Protocols to ensure biosecurity safeguard. Specifically, we will follow BMP #006: General Storage & Transport of Collected Samples; BMP #007: Moving and Packing Between Field Camps and Islands & Atolls; and BMP #011: Disease & Introduced Species Prevention Protocol in addition to our typical biosecurity protocols detailed below.

Recovery: *Receivers with or without moorings are brought to the surface by divers (operating from small boats) and placed in heavy duty garbage sacks. Garbage sacks are sealed until the equipment is brought onboard the ship. Reusable components (receivers, hard floats, metal hardware) are first soaked in a bleach solution for 24h to kill all live material, and then transferred to a vinegar bath for 48h to dissolve any remnant calcium carbonate. After this process, components are factory clean. Non reusable components (e.g. heavily fouled rope) are placed in ship-board garbage dumpsters for incineration.*

Deployment: *We only use new or sanitized components when swapping receivers. If the existing mooring is serviceable, a new/clean receiver is swapped with the in situ unit. If mooring needs replacing, or deployment is at a new station, then new mooring components are used to replace the old mooring (which is recovered and incinerated).*

Dive gear protocols: *We observe the dive gear sanitation protocols required under permit, including cleaning gear and inspecting pockets to ensure no invasive alga or other organisms are present, rinsing/soaking in a diluted beach solution, and bleach soak/rinsing between atoll/islands/reef within the Monument.*

2. If equipment needs to be replaced, will replacements be new and/or quarantined?

Yes, please see response to #1 above.

COMMENTS / RECOMMENDATIONS:

1. NMFS requests that the applicant and research staff adhere to the Boating and Diving guidelines in place for the Monument.

Noted.

2. Make sure the applicant preforms good biosecurity measures for marine aquatic invasive spp. Introduction. They need to clean their gear and inspect their pockets to ensure they don't have any invasive alga or other organism. Clean their gear by rinsing/soaking in a diluted beach solution. They also need to do a bleach soak/rinse between atoll/islands/reef within the Monument.

Noted.

Comments received from the Native Hawaiian community are summarized as follows:

Cultural reviews support the acceptance of this application. No concerns were raised.

Comments received from the public are summarized as follows:

No comments were received from the public on this application.

Additional reviews and permit history:

Are there other relevant/necessary permits or environmental reviews that have or will be issued with regard to this project? (e.g., MMPA, ESA, EA) Yes ☒ No ☐

If so, please list or explain:

- The proposed activities are in compliance with the National Environmental Policy Act.
- The proposed activities are in compliance with the National Historic Preservation Act.
- An informal consultation pursuant to section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. §1531 et seq.) was conducted on 7 May 2014 with the National Marine Fisheries Service (NMFS). NMFS concurred with NOS ONMS determination that the proposed action (fishing activities associated with top-predator tagging; swimming, snorkeling and SCUBA diving as necessary to conduct research activities in the marine environment; and associated small boat activities); are not likely to adversely affect Hawaiian monk seals (*Monachus schauinslandi*), green sea turtles (*Chelonia mydas*), hawksbill sea turtles (*Eretmochelys imbricata*), North Pacific distinct

population segment of loggerhead sea turtles (*Caretta caretta*), olive ridley sea turtles (*Lepidochelys olivacea*), leatherback sea turtles (*Dermochelys coriacea*), Main Hawaiian Islands false killer whale distinct population segment (*Pseudorca crassidens*), humpback whales (*Megaptera novaeangliae*), sperm whales (*Physeter macrocephalus*), fin whales (*Balaenoptera physalus*), blue whales (*Balaenoptera musculus*), sei whales (*Balaenoptera borealis*), north pacific right whales (*Eubalaena japonica*); and is unlikely to destroy or adversely modify designated Hawaiian monk seal critical habitat (Letter of concurrence dated 16 May 2014). The NMFS determination was based on the finding that the effects of the proposed action are expected to be insignificant, discountable, or beneficial as defined in the joint USFWS-NMFS Endangered Species Consultation Handbook

- An informal review of all aforementioned activities following section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA; 16 U.S.C. 1855(b)) is currently underway. The outcome of this review may require the applicant to adhere to other NMFS-prescribed conditions. Such conditions would be reflected in the PMNM permit, prior to issuance. An informal consultation pursuant to section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. §1531 *et seq.*) was conducted on 7 May 2014 with the National Marine Fisheries Service (NMFS) to analyze the effects of conducting fishing activities within the Monument on protected species and Hawaiian monk seal critical habitat. The consultation is valid through May 2018.
- The Department has made an exemption determination for this permit in accordance chapter 343, HRS, and Chapter 11-200, HAR. See Attachment ("DECLARATION OF EXEMPTION FROM THE PREPARATION OF AN ENVIRONMENTAL ASSESSMENT UNDER THE AUTHORITY OF CHAPTER 343, HRS AND CHAPTER 11-200 HAR, FOR PAPA HĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT RESEARCH PERMIT TO DR. CARL MEYER, HAWAII INSTITUTE OF MARINE BIOLOGY, UNIVERSITY OF HAWAII, FOR ACCESS TO STATE WATERS TO CONDUCT TOP PREDATOR FEEDING HABITS AND MOVEMENT RESEARCH ACTIVITIES UNDER PERMIT PMNM-2017-015.")

Has Applicant been granted a permit from the State in the past? Yes ☒ No ☐

If so, please summarize past permits:

- The Applicant was granted permits between 2008 through 2012 for similar work (PMNM-2008-027, PMNM-2009-009, PMNM-2009-036, PMNM-2009-037, PMNM-2010-019, PMNM-2011-018, PMNM-2012-050 and PMNM-2014-014.)
- Bud Antonelis was granted permit no. PMNM-2009-002 in 2009 for similar work.

Have there been any a) violations: Yes ☐ No ☒
 b) Late/incomplete post-activity reports: Yes ☐ No ☒

Are there any other relevant concerns from previous permits? Yes ☐ No ☒

STAFF OPINION

PMNM staff is of the opinion that the Applicant has properly demonstrated valid justification for their application and should be allowed to enter the NWHI State waters and conduct the

activities therein as specified in the application with certain special instructions and conditions, which are in addition to the Papahānaumokuākea Marine National Monument Research Permit General Conditions. All suggested special conditions have been vetted through the legal counsel of the Co-Trustee agencies (see Recommendation section).

MONUMENT MANAGEMENT BOARD OPINION

The MMB is of the opinion that the Applicant has met the findings of Presidential Proclamation 8031 and this activity may be conducted subject to completion of all compliance requirements. The MMB concurs with the special conditions recommended by PMNM staff.

RECOMMENDATION:

That the Board authorize and approve a Research Permit to Dr. Carl Meyer, Hawai'i Institute of Marine Biology, University of Hawai'i, with the following special conditions:

1. This permit is not to be used for nor does it authorize the sale of collected organisms. Under this permit, the authorized activities must be for noncommercial purposes not involving the use or sale of any organism, by-products, or materials collected within the Monument for obtaining patent or intellectual property rights.
2. The permittee may not convey, transfer, or distribute, in any fashion (including, but not limited to, selling, trading, giving, or loaning) any coral, live rock, or organism collected under this permit without the express written permission of the Co-Trustees.
3. To prevent introduction of disease or the unintended transport of live organisms, the permittee must comply with the disease and transport protocols attached to this permit.
4. Tenders and small vessels must be equipped with engines that meet EPA emissions requirements.
5. Refueling of tenders and all small vessels must be done at the support ships and outside the confines of lagoons or near-shore waters in the State NWHI Marine Refuge.
6. No fishing is allowed in State Waters except as authorized under State law for subsistence, traditional and customary practices by Native Hawaiians.

Respectfully submitted,



Maria Carnevale
State Co-Manager
Papahānaumokuākea Marine National Monument

APPROVED FOR SUBMITTAL



SUZANNE CASE
Chairperson

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:
NOAA/Inouye Regional Center
NOS/ONMS/PMNM/Attn: Permit Coordinator
1845 Wasp Blvd, Building 176
Honolulu, HI 96818
nwhipermit@noaa.gov
PHONE: (808) 725-5800 FAX: (808) 455-3093

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: Carl G. Meyer

Affiliation: Hawaii Institute of Marine Biology

Permit Category: Research

Proposed Activity Dates: June 1- August 31 2017

Proposed Method of Entry (Vessel/Plane): NOAA Cruise

Proposed Locations: French Frigate Shoals, Pearl & Hermes Reef, Midway

Estimated number of individuals (including Applicant) to be covered under this permit: 4

Estimated number of days in the Monument: 25

Description of proposed activities: (complete these sentences):

a.) The proposed activity would...

Quantify the movements of top predators (sharks and large fishes) in the Monument to: (1) improve our broad understanding of Monument ecology, (2) further elucidate the role of deep reefs in the ecology of Monument predators, and (3) further clarify movements of large predators between Monument and Main Hawaiian Island (MHI) habitats.

b.) To accomplish this activity we would

Service existing acoustic receiver stations in the monument to (1) recover detection data from predators tagged in Monument and MHI waters up to early 2017, and (2) prepare the receivers for another 12 months (i.e. into 2018) of listening.

c.) This activity would help the Monument by ...

Our research will provide Monument managers with information on the movements patterns of culturally and ecologically important top predators, and further clarify the links between Monument and Main Hawaiian Island habitats. We already have a variety of Monument and Main Hawaiian Island top predators instrumented with acoustic tags and continued monitoring effort will continue to improve our understanding of the movement patterns of these animals.

Other information or background:

Our research has minimal impact on monument resources. Our listening stations (acoustic receiver + moorings) are designed to have minimal substrate impact and leave nothing behind when they are removed.

Section A - Applicant Information

1. Applicant

Name (last, first, middle initial): Meyer, Carl, G.

Title: Assistant Researcher

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

Mark Royer

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

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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

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

University of Hawaii, Hawaii Institute of Marine Biology

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):

Mark Royer, Co-collaborator, Research Diver, Field Biologist

Danny Coffey, Co-collaborator, Research Diver, Field Biologist

TBD

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 checked="" type="checkbox"/> French Frigate Shoals	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input checked="" 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 checked="" type="checkbox"/> Shallow water	<input checked="" type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Midway Atoll	<input type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input checked="" type="checkbox"/> Deep water
<input type="checkbox"/> Kure Atoll	<input type="checkbox"/> Land-based	<input type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> Other			

Ocean Based

☐ Remaining ashore on any island or atoll (with the exception of Midway & Kure Atolls and Field Camp staff on other islands/atolls) between sunset and sunrise.

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

Location Description:

Receiver Deployment and Recovery

A total of 20 receivers are currently deployed at 3 islands/atolls in the Monument (Appendix 1). Our goal is to service and redeploy these existing receivers to provide continued monitoring coverage within the Monument.

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:*

(a) Purpose of proposed activities

The purpose of this research is to provide managers with empirical data on top predator movement patterns in Monument waters, and movements between Monument and MHI habitats. This information will provide managers with a clearer understanding of the spatial dynamics of top predators in Monument waters, and the importance of MHI habitats to predators, such as tiger sharks, that have core home ranges located within the Monument but may migrate to MHI habitats for reproductive purposes. We have the following specific goals and objectives;

1. Download 20 underwater receivers currently stationed in the Monument to retrieve stored movement data from 175 top predators tagged with acoustic transmitters from 2013 to 2017.
2. Determine how widely these animals have ranged since Summer 2016 and identify their patterns of movement.

(b) Need for proposed activities

Top predators play an important role in many ecosystems and in Monument waters this role is filled by sharks (primarily tiger, galapagos, gray reef and whitetip reef sharks) and large teleost fishes (primarily ulua) (DeCrosta, Wetherbee et al. 1997, Friedlander & DeMartini 2002, Holzwarth et al. 2006, Papastamatiou et al., 2006). Science-based management of the marine top predators of the Hawaiian archipelago requires that we know whether key species are site-attached to specific areas or, if not, how frequent and extensive are their movements. Since 2005 we have been using a combination of acoustic and satellite tags to quantify top predator movements in the Monument, and address three broad questions relevant to management zoning; (1) Do top predators move across open ocean between atolls?, (2) How extensive are their intra-atoll movements?, and (3) Do top predators exhibit predictable patterns of movement and habitat use? (4) Do predators influence the presence of herbivores on mesophotic reefs?

Using these technologies we have already made substantial progress in quantifying predator movement patterns in Monument waters and beyond (see Meyer et al. 2007a,b, Meyer et al. 2009, 2010, Papastamatiou et al. 2013, Papastamatiou et al. 2015). For example, we have shown that tiger sharks routinely swim between atolls, range along the entire Hawaiian archipelago and venture hundreds of miles beyond Monument boundaries into open-ocean. Mature female tiger sharks may travel from monument waters to the Main Hawaiian Islands for pupping during the fall (Papastamatiou et al. 2013). We also obtained the first empirical evidence that gray reef sharks swim across open-ocean between atolls. We have found other top predators (e.g. ulua, Galapagos sharks) are site-attached to individual atolls, but wide-ranging within their 'home' atoll (e.g., Meyer et al., 2007a,b, 2010). We discovered that ulua & uku have predictable patterns of movement, including diel habitat shifts and tidal & lunar rhythmicity (Meyer et al., 2007a,b). We also found that during summer full moons, ulua from all over French Frigate Shoals atoll converge on one particular location where they form large spawning aggregations (Meyer et al., 2007a).

Although we have already made substantial progress in quantifying predator movement patterns in Monument waters, important questions remain unanswered. For example, we know that female tiger sharks travel from Monument waters to MHI habitats during the fall pupping season, but we are still unclear on whether there are equivalent reverse (MHI to Monument) migrations by tiger sharks occupying core home ranges located within the MHI. We now have over 50 MHI-captured tiger sharks equipped with long-lived (10 year) transmitters, and simply by maintaining a receiver presence in the Monument, we will be able to detect movements of these sharks from the MHI to Monument waters.

(c) Scope of proposed activities

We propose to recover, download and redeploy 20 receivers already stationed in Monument waters (see Appendix 1). This will enable us to recover another 12 months of predator movement data (Summer 2016-Summer 2017) and to continue monitoring our transmitter-equipped predators in order to determine how their movement patterns vary over multi year time-scales.

*Considering the purpose of the proposed activities, do you intend to film / photograph federally protected species? Yes ☐ No ☒

For a list of terrestrial species protected under the Endangered Species Act visit:

<http://www.fws.gov/endangered/>

For a list of marine species protected under the Endangered Species Act visit:

<http://www.nmfs.noaa.gov/pr/species/esa/>

For information about species protected under the Marine Mammal Protection Act visit:

<http://www.nmfs.noaa.gov/pr/laws/mmpa/>

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?

The activity will be conducted with adequate safeguards for the resources and ecological integrity of the Monument. This project is a continuing effort to quantify top predator movements and throughout Hawaii for the purpose of informing management. Principal Investigator Carl Meyer has previously consulted with William Aila about the cultural implications of this research. Mr Aila is very familiar with our research, having both observed and assisted us during shark tagging activities conducted at French Frigate Shoals in June 2010. This provided a valuable opportunity for Carl Meyer to discuss at length with Mr Aila the

challenges associated with balancing cultural concerns against the need for directed management of Monument resources, including the gathering of scientific knowledge.

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 proposed activities will have minimal impact on the resources of the region. This year we are only asking to service existing listening devices (underwater receivers) located within Monument waters. This research is being conducted in concert with the priorities listed in Monument research plan for the Monument. The scientific knowledge provided by these activities will help managers to better understand the movement patterns of sharks and other top predators in Monument waters and beyond.

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. There is no practicable alternative to conducting activities in the Monument. We are addressing questions that are directly relevant to management of Monument resources (we are quantifying movement patterns of top predators throughout the Monument), hence the study must be carried out within 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? The management value of data produced by our research activities outweighs the minor, transient impacts on Monument resources. The methods and procedures that we are proposing will have minimal impacts on Monument resources, qualities, and ecological integrity. Our receivers are stationed on uncolonized habitats, and removal will leave no evidence of their presence in shallow habitats (see Appendix 2), and leave only a small end weight in mesophotic habitats. The scientific knowledge provided by these activities will help managers to better understand the role of sharks and other top predators in the Monument ecosystem.

e. Explain how the duration of the activity is no longer than necessary to achieve its stated purpose. The actual fieldwork component of this research involves the minimum time required to service instrumentation currently deployed in the Monument.

f. Provide information demonstrating that you are qualified to conduct and complete the activity and mitigate any potential impacts resulting from its conduct. The principle investigator has more than 20 years of experience conducting this type of research (see attached CV for details) and is well qualified to conduct and complete the activity and mitigate any potential impacts resulting from its conduct. All personnel included in this permit application have extensive experience conducting research in wildlife refuges, and in the proposed research techniques. This is a continuance of a multi-year project.

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. Our research will be supported by resources from University of Hawaii. These resources will be adequate to conduct and complete the proposed activities and mitigate any potential impacts resulting from its conduct.

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.

The methods and procedures that we are proposing are ideal for achieving our goals with minimal impacts to Monument resources, qualities, and ecological integrity. The use of passive monitoring techniques (self-contained acoustic receivers) means that we need relatively little human access to the Monument in order to achieve continuous, year-round monitoring of predator movements. Our shallow site receivers are stationed on uncolonized habitats, and removal will leave no evidence of their presence (see Appendix 2). Mesophotic receivers leave a small end-weight behind on recovery (Appendix 3).

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

We will be accessing the PMNM in a NOAA vessel

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

We have met all requirements of previously issued permits for research work in PMNM. There are no other factors that would make the issuance of a permit for our proposed activities inappropriate.

8. Procedures/Methods:

Activities will be carried out from small boats launched from a mother ship. Servicing of receivers will be done by snorkelers and SCUBA divers, and from small boats via an acoustic release system. Our chosen long-term monitoring method (remote acoustic monitoring) is ideal for quantifying animal movements in remote, environmentally-sensitive locations because it has minimal environmental impact and requires only occasional, brief access by researchers to individual study sites, yet provides continuous monitoring of animal movements at those sites.

Shallow (<30 m) receiver deployments: We will continue to use a temporary receiver mooring system that has previously been empirically demonstrated to successfully withstand seasonal high surf. Moorings, installed by snorkelers or SCUBA divers will consist of sand screws in areas of soft sediment, and chain around uncolonized substrate in hard bottom areas (live substrates will be avoided). We will completely remove these moorings when acoustic monitoring is completed (receivers will be in place for at least 2 years). The receivers will be anchored to the moorings and suspended 1-4 m above the ocean floor. The receivers will identify and record the presence of any acoustic transmitters within range (up to 500 m). The transmitter number, time of arrival and departure and the date will be recorded and stored until

the data are downloaded from the receivers to a computer. The receivers have a battery life of approximately 15 months and will be serviced at 12 month intervals.

Deep (mesophotic >50m) receiver deployments: We will recover and redeploy 6 underwater receivers at existing mesophotic sites at Pearl and Hermes Reef and French Frigate Shoals atoll. Receivers will be attached to weighted (with concrete block) moorings, and dropped to the sea floor so that they land on the flat habitat. The moorings will incorporate an acoustic release to allow for surface recovery. Use of an acoustic release means the end weights and lower 30cm of the mooring (chain, polypro and twine) are sacrificial and will be left in situ when the receivers are recovered. As with shallow units, the mesophotic zone receivers will be suspended 4 m above the ocean floor and will be serviced at 12 month intervals.

Data retrieval, reduction and analysis: We will download receivers currently deployed in Monument waters (Appendix 1). Data downloading consists of interfacing the receiver to a computer via a wireless 'bluetooth' connection, and can be accomplished in the field. Preliminary data reduction and analyses will commence after downloading.

Cited References

Friedlander AM and EE DeMartini (2002). Contrasts in density, size, and biomass of reef fishes between the northwestern and the main Hawaiian islands: the effects of fishing down apex predators. *Marine Ecology Progress Series* 230:253-264.

Holland KN, Wetherbee BM, Lowe CG and CG Meyer (1999) Movements of tiger sharks (*Galeocerdo cuvier*) in coastal Hawaiian waters. *Marine Biology* 134: 665-673.

Holzwarth SR, DeMartini EE, Zgliczynski BJ, Laughlin JL (2006) Sharks and jacks in the Northwestern Hawaiian Islands from towed-diver surveys 2000-2003. *Atoll Research Bulletin* 543: 257-280.

Meyer CG, Holland KN, Papastamatiou YP. 2007a. Seasonal and diel movements of giant trevally (*Caranx ignobilis*) at remote Hawaiian atolls: implications for the design of Marine Protected Areas. *Marine Ecology Progress Series*. 333: 13-25.

Meyer CG, Papastamatiou YP, Holland KN. 2007b. Seasonal, diel and tidal movements of green jobfish (*Aprion virescens*, Lutjanidae) at remote Hawaiian atolls: Implications for Marine Protected Area design. *Marine Biology*. 151: 2133-2143.

Meyer CG, Clark TB, Papastamatiou YP, Whitney NM, Holland KN. 2009. Long-term movements of tiger sharks (*Galeocerdo cuvier*) in Hawaii. *Marine Ecology Progress Series*. 381: 223-235.

Meyer CG, Papastamatiou YP, Holland KN. 2010. A multiple instrument approach to quantifying the movement patterns and habitat use of Tiger (*Galeocerdo cuvier*) and Galapagos

sharks (*Carcharhinus galapagensis*) at French Frigate Shoals, Hawaii. *Marine Biology*. 157:1857–1868. DOI: 10.1007/s00227-010-1457-x

Meyer CG, Meyer CG, O'Malley JM, Papastamatiou YP, Dale JJ, Hutchinson MR, et al. 2014. Growth and Maximum Size of Tiger Sharks (*Galeocerdo cuvier*) in Hawaii. *PLoS ONE* 9(1): e84799. doi:10.1371/journal.pone.0084799.

Papastamatiou YP, Wetherbee BM, Lowe CG, Crow GC. 2006. Distribution and diet of four species of carcharhinid shark in the Hawaiian Islands: evidence for resource partitioning and competitive exclusion. *Marine Ecology Progress Series* 320: 239-251

Papastamatiou YP, Meyer CG, Carvalho F, Dale JJ, Hutchinson MR, et al. 2013. Telemetry and random walk models reveal complex patterns of partial migration in a large marine predator. *Ecology* 94: 2595-2606. doi: 10.1890/12-2014.1.

Wetherbee BM, Crow GL and CG Lowe (1997). Distribution, reproduction and diet of the gray reef shark *Carcharhinus amblyrhynchos* in Hawaii. *Marine Ecology Progress Series* 151: 181-189.

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:
N/A

Scientific name:
N/A

& size of specimens:
N/A

Collection location:
N/A

☐ Whole Organism ☐ Partial Organism

9b. What will be done with the specimens after the project has ended?
N/A

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

N/A

• General site/location for collections:

N/A

• Is it an open or closed system? ☐ Open ☐ Closed

N/A

• Is there an outfall? ☐ Yes ☐ No

N/A

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

N/A

• Will organisms be released?

N/A

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

N/A

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

N/A

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

Please refer to Appendices 2 and 3

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

N/A

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

Please refer to Appendices 2 and 3

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

Analyses, interpretation and publication of data are ongoing. We already have eleven papers derived from our PMNM studies published in international peer-reviewed journals.

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

Meyer CG, Papastamatiou YP, Holland KN. 2007. Seasonal, diel and tidal movements of green jobfish (*Aprion virescens*, Lutjanidae) at remote Hawaiian atolls: Implications for Marine Protected Area design. *Marine Biology*. 151: 2133-2143.

Meyer CG, Holland KN, Papastamatiou YP. 2007. Seasonal and diel movements of giant trevally (*Caranx ignobilis*) at remote Hawaiian atolls: implications for the design of Marine Protected Areas. *Marine Ecology Progress Series*. 333: 13-25.

Meyer C.G., T.B. Clark, Y.P. Papastamatiou, N.M. Whitney, & K.N. Holland. (2009). Long-term movements of tiger sharks (*Galeocerdo cuvier*) in Hawaii. *Marine Ecology Progress Series*. 381: 223-235.

Meyer CG, Papastamatiou YP, Holland KN (2010). A multiple instrument approach to quantifying the movement patterns and habitat use of tiger and Galapagos sharks at French Frigate Shoals, Hawaii. *Marine Biology* 157: 1857-1868

Papastamatiou YP, Cartamil DP, Lowe CG, Meyer CG, Wetherbee, BM, Holland KN. 2011. Scales of orientation, directed walks, and movement path structure in sharks. *Journal of Animal Ecology*. In Press.

Dale JJ, Stankus AM, Burns MS, Meyer CG. 2011. The Shark Assemblage at French Frigate Shoals Atoll, Hawai'i: Species Composition, Abundance and Habitat Use. *PLoS ONE*. In Press.

Nakamura I, Watanabe YY, Papastamatiou YP, Sato K, Meyer CG. 2011. Yo-yo vertical movements suggest a foraging strategy for tiger sharks *Galeocerdo cuvier*. *Marine Ecology Progress Series*. In Press.

Dale JJ, Meyer CG, Clark CE. 2011. The ecology of coral reef top predators in the Papahānaumokuākea Marine National Monument. *Journal of Marine Biology*. In Press.

Iosilevskii G, Papastamatiou YP, Meyer CG, Holland KN. 2012. Energetics of the yo-yo dives of predatory sharks. *Journal of Theoretical Biology*. 294:172–181.

Meyer CG, Holland KN. 2012. Autonomous measurement of ingestion and digestion processes in free swimming sharks. *Journal of Experimental Biology*. 215, 3681-3684. doi:10.1242/jeb.075432.

Meyer C, O'Malley J, Papastamatiou Y, Dale J, Hutchinson M, Anderson J, Royer M, Holland K. 2014. Growth and maximum size of tiger sharks (*Galeocerdo cuvier*) in Hawaii. *PLoS One* 9:e84799

Papastamatiou YP, Meyer C., Carlvaho F., Dale J., Hutchinson M., Holland K. 2013. Telemetry and random walk models reveal complex patterns of partial migration in a marine predator. *Ecology*. 94: 2595-2606

Papastamatiou YP, Meyer CG, Kosaki RK, Natalie J. Wallsgrove NJ, Popp BN. 2015. Movements and foraging of predators associated with mesophotic reefs and their potential for

linking ecological habitats. Marine Ecology Progress Series. 521:155-170.
doi:10.3354/meps11110

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.

Signature

Date

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

NOAA/Inouye Regional Center
NOS/ONMS/PMNM/Attn: Permit Coordinator
1845 Wasp Blvd, Building 176
Honolulu, HI 96818
FAX: (808) 455-3093

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

Papahānaumokuākea Marine National Monument Compliance Information Sheet

1. Updated list of personnel to be covered by permit. List all personnel names and their roles here (e.g. John Doe, Diver; Jane Doe, Field Technician, Jerry Doe, Medical Assistant): Carl Meyer, Mark Royer, Danny Coffey, 1 TBD.

2. Specific Site Location(s): (Attach copies of specific collection locations): TBD

3. Other permits (list and attach documentation of all other related Federal or State permits): None

3a. For each of the permits listed, identify any permit violations or any permit that was suspended, amended, modified or revoked for cause. Explain the circumstances surrounding the violation or permit suspension, amendment, modification or revocation. N/A

4. Funding sources (Attach copies of your budget, specific to proposed activities under this permit and include funding sources. See instructions for more information):.

5. Time frame:

Activity start: September 2017

Activity completion: August 2018

Dates actively inside the Monument:

From: 9/6/2017

To: 9/30/2017

Describe any limiting factors in declaring specific dates of the proposed activity at the time of application: None

Personnel schedule in the Monument: TBD

6. Indicate (with attached documentation) what insurance policies, bonding coverage, and/or financial resources are in place to pay for or reimburse the Monument trustees for the necessary search and rescue, evacuation, and/or removal of any or all persons covered by the permit from the Monument:

7. Check the appropriate box to indicate how personnel will enter the Monument:

- ☒ Vessel
☐ Aircraft

Provide Vessel and Aircraft information:

8. The certifications/inspections (below) must be completed prior to departure for vessels (and associated tenders) entering the Monument. Fill in scheduled date (attach documentation):

- ☐ Rodent free, Date: TBD
☐ Tender vessel, Date: TBD
☐ Ballast water, Date: TBD
☐ Gear/equipment, Date: TBD
☐ Hull inspection, Date: TBD

9. Vessel information (NOTE: if you are traveling aboard a National Oceanic and Atmospheric Administration vessel, skip this question):

Vessel name:

Vessel owner:

Captain's name:

IMO#:

Vessel ID#:

Flag:

Vessel type:

Call sign:

Embarkation port:

Last port vessel will have been at prior to this embarkation:

Length:

Gross tonnage:

Total ballast water capacity volume (m3):

Total number of ballast water tanks on ship:

Total fuel capacity:

Total number of fuel tanks on ship:

Marine Sanitation Device:

Type:

Explain in detail how you will comply with the regulations regarding discharge in the Monument. Describe in detail. If applicable, attach schematics of the vessel's discharge and treatment systems:

Other fuel/hazardous materials to be carried on board and amounts:

Provide proof of a National Oceanic and Atmospheric Administration (NOAA) Office of Law Enforcement-approved Vessel Monitoring System (VMS). Provide the name and contact information of the contractor responsible for installing the VMS system. Also describe VMS unit name and type:

VMS Email:

Inmarsat ID#:

* Individuals MUST ENSURE that a type-approved VMS unit is installed and that its automatic position reports are being properly received by the NOAA OLE system prior to the issuance of a permit. To make sure your VMS is properly configured for the NOAA OLE system, please contact NOAA OLE at (808) 725-6110 or (808) 725-6100.

* PERMITS WILL NOT BE ISSUED TO INDIVIDUALS ENTERING THE MONUMENT VIA VESSEL UNTIL NOAA OLE HAS CONTACTED THE MONUMENT PERMIT COORDINATOR WITH A 'POSITIVE CHECK' READING.

10. Tender information:

On what workboats (tenders) will personnel, gear and materials be transported within the Monument? List the number of tenders/skiffs aboard and specific types of motors:

Additional Information for Land Based Operations

11. Proposed movement of personnel, gear, materials, and, if applicable, samples:

12. Room and board requirements on island:

13. Work space needs:

DID YOU INCLUDE THESE?

- ☐ Map(s) or GPS point(s) of Project Location(s), if applicable
- ☐ Funding Proposal(s)
- ☐ Funding and Award Documentation, if already received
- ☐ Documentation of Insurance, if already received
- ☐ Documentation of Inspections
- ☐ Documentation of all required Federal and State Permits or applications for permits

Papahānaumokuākea Marine National Monument Compliance Information Sheet

1. Updated list of personnel to be covered by permit. List all personnel names and their roles here (e.g. John Doe, Diver; Jane Doe, Field Technician, Jerry Doe, Medical Assistant): Carl Meyer, Mark Royer, Danny Coffey, 1 TBD.

2. Specific Site Location(s): (Attach copies of specific collection locations): TBD

3. Other permits (list and attach documentation of all other related Federal or State permits): None

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☐ Aircraft

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11. Proposed movement of personnel, gear, materials, and, if applicable, samples:

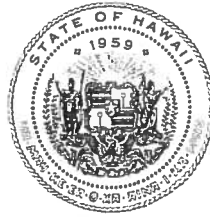
12. Room and board requirements on island:

13. Work space needs:

DID YOU INCLUDE THESE?

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- ☐ Funding Proposal(s)
- ☐ Funding and Award Documentation, if already received
- ☐ Documentation of Insurance, if already received
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- ☐ Documentation of all required Federal and State Permits or applications for permits

DAVID Y. IGE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

July 28, 2017

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY PEARSON P.E.
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

TO: Division of Aquatic Resources File

THROUGH: Suzanne D. Case, Chairperson

FROM: Maria Carnevale
Papahānaumokuākea Marine National Monument

DECLARATION OF EXEMPTION FROM THE PREPARATION OF AN ENVIRONMENTAL ASSESSMENT UNDER THE AUTHORITY OF CHAPTER 343, HRS AND CHAPTER 11-200 HAR, FOR PAPAHĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT RESEARCH PERMIT TO DR. CARL MEYER, HAWAII' I INSTITUTE OF MARINE BIOLOGY, UNIVERSITY OF HAWAII' I, FOR ACCESS TO STATE WATERS TO CONDUCT RESEARCH ACTIVITIES TO QUANTIFY THE MOVEMENTS AND ECOLOGY OF TOP PREDATORS UNDER PERMIT PMNM-2017-015

The following permitted activities are found to be exempted from preparation of an environmental assessment under the authority of Chapter 343, HRS and Chapter 11-200, HAR:

Project Title:

Papahānaumokuākea Marine National Monument Research Permit to Dr. Carl Meyer, Hawaii' i Institute of Marine Biology, University of Hawaii' i, for Access to State Waters to Conduct Research Activities to Quantify the Movements and Ecology of Top Predators.

Permit Number: PMNM-2017-015

Project Description:

The applicant proposes to conduct renewal activities to study the foraging ecology, movement, and distribution patterns of top marine predators (shark and large fish species). Up to eight (8) individuals (including the applicant) would conduct proposed activities and access the Monument via a separately permitted vessel. For 2017, the applicant intends to conduct research activities during a research cruise aboard NOAA Ship HI'IALAKAI (separately permitted under permit number PMNM-2017-002) for up to 30 days in September 2017. Proposed activity locations include marine areas within all Special Preservation Areas (SPAs) and the Midway Atoll Special Management Area.

Activities will be carried out from small boats launched from NOAA Ship HI'IALAKAI. Servicing of receivers will be done by snorkelers and SCUBA divers, and from small boats via an acoustic

release system. This long-term monitoring method (remote acoustic monitoring) is ideal for quantifying animal movements in remote, environmentally-sensitive locations because it has minimal environmental impact and requires only occasional, brief access by researchers to individual study sites, yet provides continuous monitoring of animal movements at those sites.

Shallow (<30 m) receiver deployments: The applicant will continue to use a temporary receiver mooring system that has previously been empirically demonstrated to successfully withstand seasonal high surf. Moorings, installed by snorkelers or SCUBA divers will consist of sand screws in areas of soft sediment, and chain around uncolonized substrate in hard bottom areas (live substrates will be avoided). Personnel will completely remove these moorings when acoustic monitoring is completed (receivers will be in place for at least 2 years). The receivers will be anchored to the moorings and suspended 1-4 m above the ocean floor. The receivers will identify and record the presence of any acoustic transmitters within range (up to 500 m). The transmitter number, time of arrival and departure and the date will be recorded and stored until the data are downloaded from the receivers to a computer. The receivers have a battery life of approximately 15 months and will be serviced at 12 month intervals.

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Data retrieval, reduction and analysis: Personnel will download receivers currently deployed in Monument waters. Data downloading consists of interfacing the receiver to a computer via a wireless 'bluetooth' connection, and can be accomplished in the field. Preliminary data reduction and analyses will commence after downloading.

To safeguard Monument resources the applicant would abide by the following PMNM Best Management Practices (BMPs) while conducting the aforementioned activities within the PMNM: Best Management Practices for Boat Operations and Diving Activities (BMP #004); Marine Wildlife Viewing Guidelines (BMP #010); and Disease and Introduced Species Prevention Protocol for Permitted Activities in the Marine Environment (BMP #011).

The activity would provide empirical data on top predator's spawning habits, population sizes and movement patterns in the Monument. The applicant's proposed activities directly support the Monument Management Plan (MMP) Marine Conservation Science (MCS) Action Plan Strategy MCS-1: Continue and enhance research, characterization and monitoring of marine ecosystems (PMNM MMP Vol. I, p. 122, 2008).

Consulted Parties:

The permit application was sent out for review and comment to the following scientific and cultural entities: Hawai'i Division of Aquatic Resources, Hawai'i Division of Forestry and Wildlife, Papahānaumokuākea Marine National Monument (NOAA/NOS), NOAA Pacific Islands Regional Office (NOAA-PIRO), United States Fish and Wildlife Service Hawaiian and Pacific Islands National Wildlife Refuge Complex Office, and the Office of Hawaiian Affairs (OHA). In addition, the permit application has been posted on the Monument Web site since February 15, 2017, giving the public an opportunity to comment. The application was posted within 40 days of its receipt, in accordance with the Monument's Public Notification Policy.

Exemption Determination:

After reviewing HAR § 11-200-8, including the criteria used to determine significance under HAR § 11-200-12, DLNR has concluded that the activities under this permit would have minimal or no significant effect on the environment and that issuance of the permit is categorically exempt from the requirement to prepare an environmental assessment based on the following analysis:

1. All activities associated with this permit, including the tagging of the subject sharks and fishes, collection of tissue biopsies, and recovery and redeployment of underwater acoustic receivers; have been evaluated as a single action. As a preliminary matter, multiple or phased actions, such as when a group of actions are part of a larger undertaking, or when an individual project is precedent to or represents a commitment to a larger project, must be grouped together and evaluated as a single action. HAR § 11-200-7. This permit may involve an activity that is precedent to a later planned activity, i.e. the future recovery of underwater acoustic receivers and containing predator movement data; the categorical exemption determination here will treat all planned activities as a single action.

2. The Exemption Class for Scientific Research with no Serious or Major Environmental Disturbance Appears to Apply. Chapter 343, HRS, and § 11-200-8, HAR, provide for a list of classes of actions exempt from environmental assessment requirements. HAR §11-200-8.A.5. exempts the class of actions which involve "basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource." The proposed predator feeding and tagging study activities here appear to fall squarely under the exemption class #5, exempt item #3 as described under the Division of Forestry and Wildlife exemption list published on June 12, 2008. This exemption class has been interpreted to include "affixing transmitters, markers to wild animals to record movement longevity", such as those being proposed. As discussed below, no significant disturbance to any environmental resource is anticipated in the tagging of top predators, recovery of instrumental deployment, to monitor predator movements, or collection of potential prey items including reef fish. Thus, so long as the below considerations are met, an exemption class should include the action now contemplated.

To safeguard Monument resources the Applicant would abide by the following PMNM Best Management Practices (BMPs) while conducting the aforementioned activities within the PMNM: Best Management Practices for Boat Operations and Diving Activities (BMP #004); General

Storage and Transport Protocols for Collected Samples (BMP #006); Seabird Protocols Necessary for Conducting Trolling Research and Monitoring (BMP #008); Marine Wildlife Viewing Guidelines (BMP #010); and Disease and Introduced Species Prevention Protocol for Permitted Activities in the Marine Environment (BMP #011). With respect to predator capture using trolling and handlining, if any non-target species are captured, they would be released. If bycatch becomes more than occasional, then trolling would cease in that area. To minimize fishing line entanglement with seals or seabirds, handlines would be constantly manned. Fishing would cease and lines retrieved whenever birds show an interest in fishing gear.

3. Cumulative Impacts of Actions in the Same Place and Impacts with Respect to the Potentially Particularly Sensitive Environment Will Not be Significant. Even where a categorical exemption appears to include a proposed action, the action cannot be declared exempt if “the cumulative impact of planned successive actions in the same place, over time, is significant, or when an action that is normally insignificant in its impact on the environment may be significant in a particularly sensitive environment.” HAR § 11-200-8.B. To gauge whether a significant impact or effect is probable, an exempting agency must consider every phase of a proposed action, any expected primary and secondary consequences, the long-term and short-term effects of the action, the overall and cumulative effect of the action, and the sum effects of an action on the quality of the environment. HAR § 11-200-12. Examples of actions which commonly have a significant effect on the environment are listed under HAR § 11-200-12.

Proposed activities would be a continuation of activities permitted in the Monument from 2008 to 2015. Similar predator tagging and feeding activities have also been permitted and performed within the NWHI. Past permitted projects including similar collections and techniques have shown no adverse impacts. With that mind, significant cumulative impacts are not anticipated as a result of this activity, and numerous safeguards further ensure that the potential sensitive environment of the project area will not be significantly affected. All activities will be conducted in a manner compatible with the management direction of the Monument Proclamation in that the activities do not diminish Monument resources, qualities, and ecological integrity, or have any indirect, secondary, cultural, or cumulative effects. The joint permit review process did not reveal any anticipated indirect or cumulative impacts that would occur as a result of these activities.

These activities would be conducted from the NOAA ship HI'IALAKAI (separately permitted). Interactions with sharks at FFS are also anticipated with monk seal recovery activities conducted from the NOAA monk seal field camp. There are no other known proposed projects that would be undertaken with respect to sharks at FFS during this time.

The Applicant has been conducting top predator research activities for many years with no cumulative impacts noted. Though the potential permits may occur in the same area, each project differs logistically and targets interaction with different resources. Therefore, since no significant cumulative impacts or significant impacts with respect to any particularly sensitive aspect of the project area are anticipated, the categorical exemptions identified above should remain applicable.

4. Overall Impacts will Probably be Minimal and Insignificant Any foreseeable impacts from the proposed activity will probably be minimal, and further mitigated by general and specific conditions attached to the permit. Specifically, all conservation and management activities covered by this permit will be carried out with strict safeguards for the natural, historic, and cultural resources of the Monument as required by Presidential Proclamation 8031, other applicable law and agency policies and standard operating procedures.

Conclusion. Upon consideration of the permit to be approved by the Board of Land and Natural Resources, the potential effects of the above listed project as provided by Chapter 343, HRS and Chapter 11-200 HAR, have been determined to be of probable minimal or no significant effect on the environment and exempt from the preparation of an environmental assessment.

Suzanne Case
Board of Land and Natural Resources

Date