

**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](mailto: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:** Carl Meyer

**Affiliation:** Hawaii Insitute of Marine Biology

**Permit Category:** Research

**Proposed Activity Dates:** May 1 - September 30 2009

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

**Proposed Locations:** Shallow water habitat (<100m) around French Frigate Shoals and Pearl & Hermes Reef

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

12

**Estimated number of days in the Monument:** 30

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

a.) The proposed activity would...

Quantify the population sizes of top predators (sharks and large fishes such as ulua) at French Frigate Shoals (FFS) and Pearl & Hermes Reef (PHR).

b.) To accomplish this activity we would ....

Conduct mark-release-recapture experiments at FFS and PHR. Sharks and fishes would be captured using handlines and 10 hook bottom-set lines, restrained alongside a small boat, externally tagged with numbered identification tags and then released. A second round of fishing would yield samples containing both tagged and untagged individuals that will allow calculation of predator population sizes.

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

Providing the first empirical estimates of top predator population sizes at these locations. These data will help managers to better understand the ecosystems at these atolls, and can be used to improve ecosystem modeling and management using simulation models such as ECOPATH.

**Other information or background:** Our research has minimal impact on Monument resources. Top predators are captured, tagged and released at their capture locations. No fish or sharks are removed from the Monument.

## **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):**

Carl Meyer

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

[REDACTED]

Phone:

Fax:

Email:

For students, major professor's name, telephone and email address: Not Applicable

#### **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):**

Jon Dale, Field Technician

Yannis Papastamatiou, Field Technician

Tim Clark, Field Technician

TBD, 8 Field Technicians

**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 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 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 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**

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

Location Description:

Predator tagging will be conducted in the shallow waters (<100m) around French Frigate Shoals and Pearl & Hermes Reef. The exact locations of all predator captures will be recorded using a handheld GPS.

**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 our research is to provide Monument managers with empirical estimates of top predator population sizes at French Frigate Shoals and Pearl & Hermes Reef. This information is vital for a better understanding of ecosystem function and for improving models that simulate how management actions such as shark culling are likely to impact the wider ecosystem.

(b) Need for proposed activities

We need to know how many top predators occur around atolls in order to better understand their impact on the ecosystem and to predict what may occur if their abundances change. Although a previous study estimated the biomass densities (t ha<sup>-1</sup>) of top predators along the Hawaiian archipelago (Friedlander & DeMartini 2002), we currently lack numerical estimates of predator population sizes in Monument waters (i.e., we really have no idea of how many sharks and fishes are resident at atolls in the Monument). Better empirical estimates of predator population sizes would improve output from ecosystem models such as Ecopath (Polovina 1984).” Acoustic monitoring of predators equipped with transmitters in Monument waters revealed that the majority of individuals of most species are resident at their 'home' atolls (Meyer et al. 2007a,b). Such closed populations are well suited for a classical mark recapture study to determine their abundances.

(c) Scope of proposed activities

We propose to catch, tag and release individuals from among five top predator species at FFS and PHR. We estimate that up to 500 individuals of each fish species and up to 200 individuals of each shark species will need to be tagged at each atoll to provide sufficient recaptures to estimate population sizes.

Species	Number Requested
Caranx ignobilis	1000 (500 at FFS, 500 at PHR)
Caranx melampygus	1000 (500 at FFS, 500 at PHR)
Aprion virescens	1000 (500 at FFS, 500 at PHR)
Carcharhinus galapagensis	400 (200 at FFS, 200 at PHR)
Carcharhinus amblyrhincos	400 (200 at FFS, 200 at PHR)

Cited References - see section 15

**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. We use non-lethal catch and release techniques that have minimal impact on the resources and ecological integrity of the Monument. This project is part of a continuing effort to quantify top predator ecology throughout the NWHI for the purpose of informing management. We are working with the Office of Hawaiian Affairs to seek guidance on how to mitigate potential cultural impacts associated with our research.

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. The research consists of non-lethal catch and release. This research is being conducted in concert with the priorities listed in the current draft NOAA research plan for the Monument. We are working with the Office of Hawaiian Affairs to seek guidance on how to mitigate potential cultural impacts associated with our research.

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 predator population sizes at FFS and PHR), 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. No animals will be removed from the Monument and we have empirical data showing that tagged predators resume normal patterns of behavior within hours of release (e.g., Meyer et. al. 2007a,b). We are working with the Office of Hawaiian Affairs to seek guidance on how to mitigate potential cultural impacts associated with our research.

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 reach the desired sample size of tagged predators based on historical catch rates.

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 a decade 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 the Monument, and in the use of mark-recapture techniques. We are working with the Office of Hawaiian Affairs to seek guidance on how to mitigate potential cultural impacts associated with our research.

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 is supported by an award to Hawaii Institute of Marine Biology from the National Marine Sanctuary Program (MOA 2005-008/6882), and we are provided access to the Monument on NOAA research vessels. We are also negotiating with a non-profit organization to provide additional ship support and resources for this research project. 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. No sharks or fishes will be removed from the Monument as a result of our research, and we have empirical data showing that tagged predators resume normal patterns of behavior within hours of release (e.g., Meyer et. al. 2007a,b). We are working with the Office of Hawaiian Affairs to seek guidance on how to mitigate potential cultural impacts associated with our research.

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

NOAA vessels are equipped with the NOAA OLE Vessel Monitoring System

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

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

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

Predator capture and tagging will be conducted from small boats launched from a support ship. Our predator handling & tagging activities will be carried out in accordance with the animal use protocols of the University of Hawaii (protocol #05-053). We will capture target species by trolling (towing an artificial lure) and handlining (using a single baited hook) from a small skiff, and using a bottom-set, 10 hook shark line.

Captured predators will be brought alongside the skiff, tail-rope and inverted to initiate tonic immobility. In this trance-like condition, predators remain docile while being measured and tagged. We will tag each fish or shark with an externally visible 'spaghetti' tag, bearing a reward message and unique identification number. After tagging the hook will be removed and the animal will be released. The handling process can be completed in less than 5 minutes.

#### Cited References

Friedlander AM, DeMartini EE. 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.

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.

Polovina JJ. 1984. Model of a coral reef ecosystem. I. The ECOPATH model and its application to French Frigate Shoals. *Coral reefs*. 3:1-11.

**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 Appendix 1

**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:**

N/A

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

We will begin formal analyses of the data at the conclusion of fieldwork activities. We anticipate write-up and publication of our results within 18 months of completing fieldwork.

**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.

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 9/1/08

**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