

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: Megan Donahue

Affiliation: Hawaii Institute of Marine Biology

Permit Category: Research

Proposed Activity Dates: 06/01/14-11/15/14

Proposed Method of Entry (Vessel/Plane): R/V Hi'ialakai

Proposed Locations: Shallow water reef (<100 ft depth) focused on Pocillopora colonies in forereef and pinnacle habitats. Specific locations for the study will depend on cruise logistics but ideally will include sites around French Frigate Shoals, Midway, Lisianski, Pearl & Hermes, and/or Kure.

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

4

Estimated number of days in the Monument: 30

Description of proposed activities: (complete these sentences):

a.) The proposed activity would...

(i) characterize the cryptic fish and invertebrate communities that live within Pocillopora meandrina (POME) colonies across the Hawaiian Archipelago, including the (ii) within-species genetic diversity and between-species community diversity. This study merges genetic connectivity and ecological dynamics, helping PMNM managers to relate Archipelago-wide connectivity to local-scale community connectivity and resilience. By focusing genetic and ecological survey efforts on a fairly discrete community unit, this project will provide Monument management with information regarding connectivity, cryptic species diversity, and species interactions within PMNM coral reefs at scales that are not being addressed by ongoing surveys. These results will enable us to develop models of reef metacommunities that can be used to predict community responses to global change at local and regional spatial scales, thereby strengthening our ability to establish effective ecosystem-based marine management strategies.

b.) To accomplish this activity we would

(i) visually survey the communities (fish and mobile invertebrates) living within the structure created by POME colonies at forereef sites spanning a depth range of 30 to 100 feet at several sites at each atoll. The size and health status of POME colonies will be assessed in situ and in photographs.

(ii) place video cameras to record species interactions in 3 POME colonies at each site for 30 to 60 minutes. The interactions recorded on these videos will be scored to improve our understanding of community dynamics, and evaluate differences in community dynamics between the MHI and NWHI.

(iii) collect tissue samples and analyze genetic data (in coordination with Drs Brian Bowen and Rob Toonen) to assess intraspecific genetic diversity and connectivity between sites. In particular, we would survey for 4 fish species and 7 invertebrate species at all visual survey sites, using small polespears and handnets to collect fish, nonlethal tissue biopsies for invertebrates, and DNA sequencing to assess genetic diversity and connectivity among reef habitats.

(iv) relate community composition, diversity, and behavior to remotely sensed and in situ environmental data from NASA and NOAA CRED (including pH, temperature, salinity, and chlorophyll).

c.) This activity would help the Monument by ... characterizing a community that is not captured by current survey efforts, including several Hawai'i endemics. Although POME colony size and density are assessed in current benthic RAMP surveys, the specialist semi-cryptic community of invertebrates and fishes that live within POME colonies have not been systematically assessed. Therefore, this study will provide a baseline for these semi-cryptic POME communities within the NWHI. This study will also document within species genetic variability and connectivity at smaller scales than those evaluated by Drs Toonen and Bowen providing Monument managers details on natural barriers to connectivity at the individual island scale. At the nexus of genetic connectivity and ecological dynamics, this study will combine these measures of diversity and connectivity with the relative strength of species interactions (from video footage) to develop metacommunity models. These models will be used to assess community resilience at local and regional scales.

Other information or background: To the extent practicable, forereef sites will be co-located with NOAA-CRED sites to minimize impact and ease collaboration of data resources. We are actively coordinating with Drs. Toonen and Bowen to ensure that there is not a duplication of effort in the genetic sampling. These POME communities have not been targeted in previous surveys for genetic connectivity by Bowen and Toonen, and Field PI Chelsie Counsell will work closely with them on the collection and analysis of samples. Our active coordination and collaboration with Drs. Bowen and Toonen will minimize the take of individuals from the Monument.