

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: Robert J. Toonen

Affiliation: Hawaii Institute of Marine Biology, University of Hawaii at Manoa

Permit Category: Research

Proposed Activity Dates: 05/15/09 through 11/15/09

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

Proposed Locations: Shallow water habitats (< 100 feet depth), focused on completing connectivity sampling in locations that were excluded due to weather conditions, cruise constraints or time in previous years. Our Particular focus will be: 1) the center of the NWHI chain between French Frigate Shoals and Pearl and Hermes Atolls and 2) the near NWHI between Kauai and French Frigate Shoals. However, as with previous years, we request latitude to sample other regions as weather and opportunity dictate. There may also be the potential for some deep water sampling (>100ft) via technical diving operations but all shallower than 500ft.

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

5 berthing positions for my research team spread across up to 3 different research cruises, plus available members of crew from other permitted activities who can collect opportunistically on our behalf.

Estimated number of days in the Monument: Up to approximately 90 days spread across 3 research cruises

Description of proposed activities: (complete these sentences):

a.) The proposed activity would...

collect non-lethal tissue biopsy samples of common reef invertebrates to conduct a population genetic survey. This survey is an attempt to complete the on-going effort to determine patterns of connectivity or isolation among each reef ecosystem throughout the Hawaiian Archipelago with a focus on locations with little previous sampling effort. The primary goal of this work is to determine patterns of connectivity and identify regions of limited exchange throughout Papahānaumokuākea Marine National Monument and between the Monument and the Main Eight Hawaiian Islands.

b.) To accomplish this activity we would
collect target invertebrates by hand and take tiny tissue biopsy samples prior to release of the live animals back to the environment. These samples are identified in a sample database and tissues are preserved for future DNA analyses to determine patterns of genetic structure among locations and infer the level and magnitude of exchange among those populations.

c.) This activity would help the Monument by ...
determining the degree of connectivity or isolation among each atoll, reef or bank across the Monument. Preliminary results from this study indicate that there are regions of both high exchange and of strong isolation within the Archipelago that need to be considered in management strategies. We seek to complete the sampling of areas of interest to determine the specific locations of genetic breaks throughout the archipelago to determine which portions of the Monument are isolated ecosystems that must each stand or fall on their own (i.e., a series of relatively fragile units) and which portions are individual components of a larger meta-population that can draw on individuals and resources at other locations in times of stress (i.e., a more robust ecosystem). Additionally, this study will address the long-standing question of whether or not the populations in the Monument will serve as a source of recruits to replenish exploited stocks in the Main Hawaiian Islands.

Other information or background: Virtually every management agency on the planet is seeking to better understand patterns of connectivity because assays such as those outlined here increase decision-making capacity, and provide critical management information with solid statistical basis and great scientific credibility.