

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: Derek Smith

Affiliation: Hawai'i Institute of Marine Biology/University of Hawai'i

Permit Category: Research

Proposed Activity Dates: May 1st, 2010 - August 31st, 2010

Proposed Method of Entry (Vessel/Plane): NOAA Research Vessel Hi'ialakai

Proposed Locations: Cruise itinerary is unknown at this time and therefore this permit will cover activity for all atolls in the Monument to provide flexibility.

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...

continue studies to compare the biological community structure and diversity of maritime heritage resource sites with that of the surrounding areas to determine if there are significant differences and continue monitoring efforts to assess future changes in these communities.

b.) To accomplish this activity we would

conduct non-invasive ecological surveys using point-intercept and photo transects, deploy small remote-sensing data loggers to provide correlative environmental information, and sample coral colonies that harbor dinoflagellate symbionts.

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

increasing understanding of the community ecology of marine organisms associated with maritime heritage resource sites throughout the Monument to improve ecosystem-based management of these cultural resources.

Other information or background: Representing early Polynesian and native Hawaiian voyages through contemporary naval battles in the Pacific Theatre, the maritime heritage sites in the Monument are unique, significant historic and cultural resources. It is critically important we

properly study and interpret these resources to add an important dimension to our understanding and appreciation of our rich maritime legacy (Monument Management Plan, 2008).

On the June 2009 Hi'ialakai research cruise, a small team (Gleason, Smith, Mooney) representing the Papahānaumokuākea Marine National Monument Maritime Heritage Program and the University of Hawaii visited two shipwreck sites at French Frigate Shoals, four shipwreck sites at Pearl and Hermes Atoll, three shipwreck sites and one aircraft wreck at Midway Island, and three shipwreck sites at Kure Atoll. 24 non-invasive ecological transects (photoquadrat, fish abundance, and rugosity) were conducted at three sites (72 total), non-lethal coral biopsies were collected at five sites (135 total), the CTD data logger was deployed at three sites (130 hours total), and long-term temperature/tide data loggers were deployed at three sites (6 total). All transect and oceanographic data are currently undergoing statistical analysis and coral samples are undergoing genetic analysis at HIMB.

Our knowledge of the dynamic ocean landscape has increased greatly in recent years as a result of the multidisciplinary approach to studying the environment. Traditionally, archaeologists have focused their studies on the material remains of past human life and activities. The quantification of these remains often resembles ecological assessment in the methodology (i.e. survey transects, measurements, etc), but the subject matter does not allow for testable, hypothesis-driven science. Many archaeologists now share the desire to develop a more scientific archaeological approach, enabling researchers to assess the correctness of their conclusions (Hunt et al., 2001). In this way, archaeology can benefit from the incorporation of ecological information to their studies. Ecological science also benefits from ongoing studies of the material remains from man-made disturbances and the effects of introduced foreign materials on the community structure at those disturbance sites. Few studies have investigated these interactions on intentionally placed objects such as artificial reefs, and even fewer have looked at community dynamics surrounding unintentionally placed objects.

We are beginning to understand that conservation and preservation efforts focused on maritime heritage resources need to include not only traditional archaeological surveys, but also ongoing ecological assessment of the biological communities specifically associated with them. Using accepted assessment techniques, it is possible to determine and enhance the levels of in situ protection by monitoring the diversity and activity of marine organisms (Pournou et al. 2001).

References:

Hunt, T., Lipo, C., Sterling, L., 2001. Posing Questions for a Scientific Archaeology. In: Posing Questions for a Scientific Archaeology, pp. 1-15. Westport, CT: Bergin and Garvey.

Pournou, A., Jones, A., Moss, S., 2001. Biodeterioration dynamics of marine wreck-sites determine the need for their in situ protection. *The International Journal of Nautical Archaeology*. Volume 30.2. pp299-305. 2001.