

## **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:** Shauna Kehaunani Tom

**Affiliation:** N/A

**Permit Category:** Native Hawaiian Practices

**Proposed Activity Dates:** September – November 2011

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

**Proposed Locations:** Nihoa Island Mokumanamana Island, French Frigate Shoals (La Perouse Pinnacle), Gardner Pinnacles

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

Twelve individuals are to be covered under this permit

**Estimated number of days in the Monument:** 12 days

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

a.) The proposed activity would...

The proposed activity aims to examine the basic ecology of 'opihi populations and intertidal ecosystems within the NWHI by making keen observations of the environment and interactions by understanding connections with atmospheric and seasonal cycles from a Native Hawaiian perspective. Through a collaboration with Na Mamo o Muole'a, the Nature Conservancy, the Hawai'i Institute of Marine Biology, Friends of Papahānaumokuākea and the NOAA Papahānaumokuākea Marine National Monument; a standard 'opihi monitoring protocol which is inclusive of Hawaiian methods of monitoring, has been developed (and is continuously being refined) to monitor populations within select locales on Hawaii Island, Maui, Kaho'olawe and the NWHI. This would be the third year collecting data at locations within the NWHI. Consistent with proclamation 8031, these activities will strengthen cultural and spiritual connections to the Northwestern Hawaiian islands and foster the expansion and perpetuation of Native Hawaiian ecological knowledge. This knowledge may be critical as it is observed by local Hawaii residents that 'opihi stocks are generally diminishing in size and number in the main Hawaiian islands, therefore more data in this area may help to curb the decline. In addition, comprehensive surveys of the intertidal zone within the NWHI have never been conducted. The continuation of 'opihi data collection, and comprehensive intertidal surveys (including fishes, algae and invertebrates) using Native Hawaiian ecological knowledge coupled with western science will help to contribute to the overall health of Papahanaumokuakea.

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

To accomplish this activity we will utilize Native Hawaiian protocol and practice, based on traditional knowledge, to assess the environment, which will be integrated with the scientific ecological data. Native Hawaiian observations include using all senses to note activities in the sky, land, and ocean. Documenting activities and recording connections between these events will highlight relationships and possible dependencies between reoccurring events and activities.

- Sky observations include looking at cloud formations, noting wind direction/strength and what times it changes, visibility of the horizon, bird activity, other weather related observations such as rain or rainbows, the rising and setting of the moon and sun, the moon phase, and stars.
- Land observations include looking at any plants that are flowering, seeding or fruiting, new growth, animals reproducing, precipitation and soil moisture, bird arrival and departure and any other animal behaviors. Land observations from the main Hawaiian Islands during the expedition may also be useful to help remember activities in the NWHI during that time. For example, we notice hala fruiting here on the main islands and can relate that in the Northwestern Hawaiian Islands, this is the season when juvenile iwa are still in the nest.
- Ocean observations include noting the tide (high/low and time), waves and currents, identifying and looking at the behavior of invertebrates, limu (algae) and fish in the intertidal environments, noting any spawning or aggregation of species, and noting any juveniles and newly recruited species. (see observation datasheet).

Through these types of observations, one can discover how different the intertidal zone changes between seasons (Kau-summer/Ho'oil-o-winter). At sites in the MHI, the limu (Crustose Coralline Algae (CCA) and macroalgae) zone expands during the winter, due to the large waves that are generated by winter storms, and decrease during the calm summer months. This allows other organisms such as 'opihi and ha'uke'uke to expand their habitable zone as well. New recruits for 'opihi and ha'uke'uke were observed during the winter season about 1-2 months after a peak spawning event, but wasn't observed during the summer season. The peak spawning period was determined by conducting a gonad study for both 'opihi and ha'uke'uke. These are just a few examples that demonstrate how both western and traditional knowledge can complement each other to obtain both quantitative and qualitative data.

The scientific research methods include laying belt transects to assess class size, population density, community structure, species range, distribution, and rugosity for all organisms within the intertidal zone. A minimum of 20 'opihi population/ intertidal surveys at each island / atoll will be conducted. Statistical analysis of the data will be analyzed at the Hawai'i Institute of Marine Biology lab. Data analyzed will be useful to local and governmental managers to make effective decisions on managing the resources.

'Opihi (Limpets, or *Cellana exarata*, *Cellana sandwicensis*, and *Cellana talcosa*) and ha'uke'uke (Helmet urchin, or *Colobocentrotus atratus*) gonad studies will also be conducted in

partnership with researchers at Hawaii Institute of Marine Biology (HIMB) to gain a better understanding of reproductive cycles. Since NWHI 'opihi populations are genetically different than MHI populations, spawning cycles may also be different (Bird et al 2007). Ha'uke'uke help to maintain habitat for 'opihi to live because they graze on the macro-algae that could displace 'opihi populations. The gonad studies would give a better understanding of 'opihi and ha'uke'uke spawning in the NWHI. This involves the extraction of 50 individuals of each species from each island (Mokumanamana, Nihoa, Gardner Pinnacles, French Frigate Shoals); all collections will be conducted through the research permit application submitted by Dr. Rob Toonen at HIMB, and shared with cultural researchers. The following measurements will be taken for each 'opihi extracted (shell length, shell width, total weight, meat weight, gonad weight, shell weight, inside shell length, inside shell width and sex). Ha'uke'uke measurements will include diameter, total weight, gonad weight and sex. (see attached 'opihi and ha'uke'uke gonad data sheet).

The research team will work together to apply this integrated monitoring approach. The research team will be comprised of cultural researcher / practitioners, Western research scientists, and managers. To ensure the success of these field studies, the team will conduct appropriate protocol and offer ho'okupu (cultural offerings) to maintain the spiritual integrity of the sites that are visited.

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

This activity will not only add to the current knowledge of the marine environment in the NWHI, it will help to gain a better understanding of the resources by looking at the resources through a Native Hawaiian cultural lens ensuring a holistic approach to interaction and care. It will also help the monument by continuing to re-establish Native Hawaiian ancestral consciousness and awareness with regard to the health and condition of the marine resources. Native Hawaiian protocol and methodology is integrated with western scientific protocol and methodology to better understand the status of intertidal marine resources and helps the Monument strengthen its management of cultural resources and ensures the strong participation of Native Hawaiians in the region's long-term protection. By providing opportunities to conduct cultural research, (cultural) researchers will assist in the recovery of important Native Hawaiian marine management practices and support the use of Native Hawaiian traditional ecological knowledge. Additionally, the permitted cultural practitioners and researchers will be key to the development of an eventual cultural access and monitoring plan for the NWHI.

**Other information or background:** Additionally this project is also supported by the following activities in the Monument Management Plan, (NHCH-2.1, 2.2, 2.3, 2.5, 2.6, 3.4 and NHCI – 3.1 and 3.2) all of which call for the identification of Native Hawaiian research priorities and access opportunities.