

## **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 G. Meyer

**Affiliation:** Hawaii Institute of Marine Biology

**Permit Category:** Research

**Proposed Activity Dates:** Aug 25 2012 - Aug 31 2013

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

**Proposed Locations:** Necker, Nihoa, French Frigate Shoals, Gardner Pinnacles, Maro Reef, Lisianski, Laysan, Pearl & Hermes Reef, Midway, Kure

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

8

**Estimated number of days in the Monument:** 70

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

a.) The proposed activity would...

Quantify the movements and trophic ecology of top predators (sharks and large fishes) in the Monument to: (1) improve our broad understanding of Monument ecology, (2) provide further specific insight into shark predation on Hawaiian monk seals at French Frigate Shoals Atoll, and (3) elucidate the role of deep reefs in the ecology of Monument predators.

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

Capture and equip top predators with electronic tags, and monitor their movements using acoustic receivers (deployed on the sea floor). Collect small, non-lethal tissue samples from top predators for chemical analysis to determine feeding habits. Collect reference isotopic samples from deep and shallow reefs by: (1) lethal sampling of 120 reef fishes (collected via 3-prong pole spear), and (2) sampling benthic algae and phytoplankton. These reference samples will be used to determine the trophic position and feeding location of predators.

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

Our research will provide Monument managers with information on the movements patterns and feeding habitats of culturally and ecologically important top predators. We will quantify how deep sharks and large fishes such as ulua range, and begin to assess the depths at which these predators routinely forage to determine where competitive overlap may exist between these species and Hawaiian monk seals. We will provide Monument managers with empirical data on shark movement patterns and diet at French Frigate Shoals atoll. This information is vital for a better understanding of shark predation on Hawaiian monk seals and for selecting appropriate management strategies for mitigating predation impacts on monk seals. We will also provide new information on the importance of a key habitat type (mesophotic deep reefs) in the Monument, to the ecology of top predators.

**Other information or background:** Our research has minimal impact on monument resources. Sharks and other predators are captured, tagged and released at their capture locations. Our listening stations (acoustic receiver + moorings) are designed to have minimal substrate impact and leave nothing behind when they are removed. We are requesting to lethally sample only 120 of the most common reef fishes. Principal Investigator Carl Meyer has previously consulted with William Aila about the cultural implications of this research. Mr Aila is very familiar with our research, having both observed and assisted us during shark tagging activities conducted at French Frigate Shoals in June 2010. This provided a valuable opportunity for Carl Meyer to discuss at length with Mr Aila the challenges associated with balancing cultural concerns against the need for directed management of Monument resources, including the gathering of scientific knowledge.