

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: Dr. Barbara Block

Permit Category: Research

Proposed Activity Dates: January 1- May 31, 2020, 2021 and 2022

Proposed Method of Entry (Vessel/Plane): Vessel, MY WILD HOOKER

Proposed Locations: Deepwater habitat, Nihoa to Gardner Pinnacles, outside State waters (3 miles), within the original Monument boundaries and in the Monument expansion area.

Estimated number of individuals (including Applicant) to be covered under this permit:
10

Estimated number of days in the Monument: 45 days per calendar year

Description of proposed activities: (complete these sentences):

- a.) The proposed activity seeks to answer the following questions: How do billfishes and tunas utilize the MPA? What residency time do these animals have in the MPA waters? What environmental conditions and oceanographic preferences are they utilizing in the MPA? What areas outside the MPA provide critical habitat in state and international waters?

To answer these questions we propose to undertake electronic and conventional tagging of yellowfin tunas (yellowfin and bigeye) and billfishes (blue marlin, black marlin, sailfish, and spearfish) caught by trolling, on hook and line in order to track the movements of these important pelagic species within and perhaps outside the Monument. While trolling for these species we would also tag and release any bycatch species such as blue, mako, thresher and other shark species encountered in the region and captured on hook and line. Satellite and archival tags provide detailed knowledge of location and tuna and billfish diving behaviors collected simultaneously with oceanographic data. Together these data provide in situ knowledge on how animals use these habitats.

- b.) To accomplish this activity we would use trolled lures to attract fish to the boat. Fish will be captured on J or circle hooks, and released post tagging using standard recreational fishing techniques (hook removal post tagging).
- c.) This trip with the team being proposed promises to provide unique opportunities to tag pelagic fish and track their travels in and out of the NWHI and a large Marine Protected Area.

Other information or background:

The project represents a collaboration of an accomplished recreational fishing team with the Block Lab of Stanford University. Dr. Block has been tagging in the North Pacific for 25 years and has put over 3000 tags (TOPP, IGMR, HIBT) inclusive of pop up satellite and archival tags on Pacific bluefin, yellowfin, big-eye, albacore tunas, lamnid sharks such as white, salmon and mako sharks, threshers, blue sharks, swordfish, and blue and black marlin, sailfish and spearfish. She is the scientific lead on the TAG a Giant project to tag tunas, and the IGFA efforts to enable citizen science tagging of billfish which is similar to this project (fishers wanting to help tag in the MPA). In this unique MPA to date, there is little data except some tracks from white sharks that were tagged in California and use areas in the PMNM. Given the team will be offered the platform of an excellent ship to conduct sportfishing it is most likely that blue marlin and yellowfin tunas will be the most likely catches that will be tagged. To discern the role of the large MPA for protecting pelagic species in US waters we propose to provide the vessel with up to 25 tags a year prepared for deployment on any species they catch and release.

We will meet our objectives by tagging from an accomplished sportfisher involving a team working together wherein tag and release protocols will be as followed. Fish will be caught via trolling using heavy 130 pound test fishing tackle and heavy test leaders. Upon reeling in the fish to the stern of the boat, satellite tags will be placed into the fish using established techniques with Wildlife Computer or Microwave Telemetry tags. Satellite tags will be tethered with a custom 4-layer attachment tether and custom titanium dart. Whenever possible, scientists experienced with tagging will be onboard and will train the owner, Captain and mates in tagging. Genetic samples will be taken with a biopsy tube on the tagging stick-stored in ethanol and then sent back to the lab for further analyses. For billfish and tunas all efforts to release the fish without hooks will be made. Hook removal tools will be utilized when the fish is alongside the vessel for tagging. If the hook cannot be removed quickly and safely, the leader will be cut as close to the hook as possible before the fish is released. In addition, any bycatch of sharks hooked during these efforts will be released with electronic archival or conventional tags, depending on the species and availability of tag-types at the time of encounter.

When near the boat, fish will be carefully handled, and tag placement will be 12 cm into the animal. The titanium dart will be rinsed with an alcohol pad, or with betadine and

inserted with a titanium applicator tip on a specially-designed tagging pole fitted to the custom tag dart. Attachments with these techniques have been proven. Upon release billfish and tunas will be irrigated and revived to help insure survivorship. Sharks are more durable and will be released readily using methods that ensure the animal's survival.

Pop-up satellite archival tags (PSATs) track movements of large migratory marine animals. A PSAT is an archival tag (or data logger) that is equipped with a means to transmit the collected data via the Argos satellite system. The major advantage is that it does not have to be physically retrieved like an archival tag for the data to be available making it a viable, fishery independent tool for animal behavior and migration studies. Location, depth, temperature, oxygen levels, and body movement data are used to answer questions about migratory patterns, seasonal feeding movements, daily habits, and survival after catch and release, for examples.

A satellite tag is generally constructed of several components: a data-logging microprocessor, a nose cone with a metallic release section, a float, and an antenna. The release sections include a corrosive pin that is actively corroded with electrolysis on a preset date or after a specified period of time. Some limitations of using satellite tags are their depth limitations (2000m), their costs (\$3000–\$4000+), their vulnerability to loss by environmental issues (biofouling), or premature release through ingestion by a predator. The Block lab has had high success to date with both tunas and billfish and will put all data into a public database via the Animal telemetry network (IOOS) cite and our own TOPP website (www.topp.org).

This activity will benefit the Monument by determining how highly migratory species utilize the PNMN. The Block lab has extensively tagged off Kona with over 75 tracks of blue and black marlin and spearfish recorded. Tracks up to 243 days have been recorded over a decade of tagging in Hawaii. This citizen science effort in coordination with the International Game Fish Association (IGFA) has yielded over 18,000 days of data to date. The data is held in a public repository where it can be download by scientists, anglers and the general public. See also: <https://igfa.org/the-great-marlin-race/>

While pop-up satellite tags do release from the fish they are implanted in, based on years of previous experience in the Main Hawaiian Islands, we expect that all of these tags will be “discharged” outside the monument, because they will be attached to the billfish for 180 days or more, during which time we fully expect that the fish will have swum well outside the Monument boundaries. Should any of the pop-up tags release within the Monument it is possible to track their location from the location signal they emit, and recover the tag.

All other tags will remain with the fish until it is recaptured and they will not be “discharged” within the Monument.