

State of Hawai'i  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
Division of Aquatic Resources  
Honolulu, Hawai'i 96813

July 22, 2016

Board of Land and Natural Resources  
Honolulu, Hawai'i

Request for Authorization and Approval to Issue a Papahānaumokuākea Marine National Monument Research Permit to Dr. Charles Littnan, NOAA Fisheries, Pacific Islands Fisheries Science Center, for Access to State Waters to Conduct Unmanned Aerial System Monitoring Surveys of the Natural Resources of PMNM

The Division of Aquatic Resources (DAR) hereby submits a request for your authorization and approval for issuance of a Papahānaumokuākea Marine National Monument conservation and management permit to Dr. Charles Littnan, Lead Scientist, Hawaiian Monk Seal Research Program, NOAA, pursuant to § 187A-6, Hawai'i Revised Statutes (HRS), Chapter 13-60.5, Hawai'i Administrative Rules (HAR), and all other applicable laws and regulations.

The conservation and management permit, as described below, would allow entry and activities to occur in Papahānaumokuākea Marine National Monument, including the NWHI State Marine Refuge and the waters (0-3 nautical miles) surrounding the following sites:

- Nihoa Island
- Mokumanamana (Necker Island)
- French Frigate Shoals
- Laysan Island
- Lisianski Island
- Pearl and Hermes Atoll
- Midway Atoll

The activities covered under this permit would occur between August 1, 2016 and July 31, 2017. The proposed activities have previously been permitted and conducted in the Monument under a research permit. This is the first time this work would be permitted under the conservation and management permit category.

INTENDED ACTIVITIES

The Applicant proposes to conduct video camera surveys of Nihoa, Mokumanamana, French Frigate Shoals, Laysan, Lisianski, Pearl and Hermes Atoll, and Midway Atoll to for environmental monitoring and surveying activities in the Northwestern Hawaiian Islands. The Applicant has previously conducted surveys to monitor marine debris and marine mammal populations at selected areas of the NWHI.

The primary goals of this mission would include: assess the ability of the system to operate with minimal disturbance to seabird colonies and marine mammals; conduct population surveys of monk seals; conduct aerial surveys of Tern Island to assess degradation of island infrastructure; and develop techniques for body condition assessment of monk seals.

To carry out the surveys, the Applicant would deploy an APH-22 multi-rotor Unmanned Aircraft System (UAS). The APH-22 is a vertical takeoff and landing unit, electric battery powered hexacopter (contains six propellers, each 15 cm. length and 5.5 mm. width), weighing 6 lbs. with a total length of 32.4 in. It consists of a separate ground control station to provide remote control of the unit.

Deployment of the UAS would be conducted from land, aboard a separately permitted NOAA Ship (e.g. NOAA Ship OSCAR ELTON SETTE) or from its small boats. The APH-22 would be hand-launched from a level surface and retrieved from land as it cannot land in water. Only one UAS would be deployed at a time and the unit would remain within visual range and one mile of the remote operator at all times. The system would fly at altitudes below 500 feet. Each flight would be of 15-20 minutes in duration, occur only during daylight hours, in conditions with less than 25 knot winds, and operated only by NOAA certified pilots.

The UAS system has the ability to collect remote imagery and develop habitat maps for a broad range of resource protection and management issues. The UAS platform would support monitoring and surveying of natural resources and marine debris in some or all of the areas of Nihoa, Mokumanamana, French Frigate Shoals, Laysan, Lisianski, Pearl and Hermes Atoll, and Midway Atoll. Collected images would be used for Hawaiian monk seal population and health assessments, marine debris detection, and surveying Tern Island to document entrapment threats to wildlife. The applicant and up to three (3) collaborators are tentatively scheduled to conduct activities via NOAA Ship NOAA Ship OSCAR ELTON SETTE (vessel operations separately permitted under permit number PMNM-2016-005) cruise September 9-30, 2016.

The UAS would increase the monitoring and surveying capacity in the Monument and provide managers with a more comprehensive view of the state of the Monument's natural resources on the remote islands without (1) interference; (2) the potential for the introduction of invasive species; and (3) human disturbance to the natural resources. The continuing development of survey methods and data collection using UAS technology will help inform Monument adaptive management practices.

The activity will benefit the conservation and management of the Monument by supporting the following strategy and activities under the Monument Management Plan's Marine Conservation Science (MCS) and Habitat Management and Conservation (HMC) Action Plan, Activity: MCS 1: Continue and enhance research, characterization and monitoring of marine ecosystems for the life of the plan, as appropriate, HMC 3.2: Inventory and map manmade structures and changes in natural beach and reef state that may influence erosion and depositional processes at all of the beach strand units of the Monument., and HMC 9.2: Develop and implement techniques for monitoring plant and animal populations on cliff habitats in the Monument within 10 years ((PMNM MMP Vol. 1, 2008).

The activities described above may require the following regulated activities to occur in State waters:

- Anchoring a vessel
- Swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area

#### REVIEW PROCESS:

The permit application was sent out for review and comment to the following scientific and cultural entities: Hawai'i Division of Aquatic Resources, Hawai'i Division of Forestry and Wildlife, Papahānaumokuākea Marine National Monument (NOAA/NOS), NOAA Pacific Islands Regional Office (NOAA-PIRO), United States Fish and Wildlife Service Hawaiian and Pacific Islands National Wildlife Refuge Complex Office, the Office of Hawaiian Affairs (OHA), and the PMNM Native Hawaiian Cultural Working Group. In addition, the permit application has been posted on the Monument Web site since April 4, 2016 giving the public an opportunity to comment. The application was posted within 40 days of its receipt, in accordance with the Monument's Public Notification Policy.

**Comments received from the scientific community are summarized as follows:**

#### QUESTIONS:

1. Since the separately permitted support vessel should already be authorized to anchor its small boats, is it necessary to have the "anchoring a vessel" activity checked on page 6?

The Applicant responded with:

*That would be up to the PMNM Permit Coordinators to determine if that is necessary. I am unaware if the Oscar Elton Sette or Hi'ialakai requested permission to anchor their small boats.*

2. On page 12, the application mentions that UAS launches at Mokumanamana would only occur via small boat. However, land access at Mokumanamana is marked on page 6. Does the applicant intend to conduct launches on land at Mokumanamana?

The Applicant responded with:

*There will be no launches from land at Mokumanamana. In the very unlikely situation that we must land the UAS or it crashes on land then we would try to retrieve it (please see #7 below). The HMSRP has permission on the Manager's Permit to access Mokumanamana so, like Question #1 above, it may be unnecessary to include it in this application.*

3. What effect will the UAS operations have on island bird life?

The Applicant responded with:

*We have used two UAS platforms in the NWHI to date. In dozens of flights there have been no bird mortalities or bird strikes. There was one instance of a Frigate bird touching the fuselage of the*

*fixed winged plane UAS in 2014. There have been no bird contacts with the APH-22 (the platform this application covers).*

*Birds in flight do demonstrate some interest in the UAS as they fly, particularly fairy terns. However, the noise and rotor wash (air being blown off the rotors) seems to deter them when they get within several feet.*

*The primary impact is temporarily disturbing birds during takeoff and landings, but mostly takeoffs. The revving up of the motor and lifting of the platform flushes birds from the ground and nearby plants. Most of the birds settle quickly (most within a minute). They do not flush if the platform is already at altitude and flies over them (so it isn't continuous disturbance over the entire flight).*

*To mitigate the flushing of birds we don't repeatedly launch and recover from the same spot and work to find less vegetated areas when possible to launch. This will be mitigated further when launches are from the water.*

4. If damaged is caused to a resource (seabirds, strikes a monk seal, damages native or rare vegetation, nests, etc.) or a structure (some of the islands have infrastructure and historical structures), who is the responsible party? Where do the funds come from to address a situation like this, if it were to occur?

The Applicant responded with:

*This mission is being undertaken by NOAA Fisheries, so all impacts and subsequent action to remedy them are the responsibility of the US Government.*

*How many UAS operations and individual flights have been conducted by NOAA here in the Pacific? How many, if any, have had either an operator error or mechanical error?*

*NOAA has flown the APH-22 on marine mammal projects around the world including monk seals in the NWHI, leopard seals and fur seals in Antarctica, killer whales in the Pacific Northwest, Stellar sea lions in Alaska, and many more.*

*This has resulted in over 900 flights with roughly 225 hours of flight time and more than 1000 km horizontal distance surveyed. The only two reported problems were 1) overheating that caused the altitude sensor to be slightly inaccurate and 2) a bad battery that resulted in the platform being recalled before the flight was complete. There have been no serious mechanical failures or crashes.*

*This safety record is the result of a few factors. First and foremost is the quality of the machine. These are not the standard UAS that hobbyists buy off the shelf. They are specially made to conduct the missions for which they are used. The APH-22 includes a variety of control and safety features to mitigate dangers. These include default position hold – if your hands come off the controller the UAS holds its current position rather than careening off uncontrolled. Signal loss protocols – if the signal between the control unit and the UAS drops out the UAS holds in place (rather than flying off) and if the signal is lost for more than a minute will land itself or return to its original takeoff location and land itself (depending on how it is programmed). The ground station has a battery*

*monitor and there are battery power thresholds, when the battery gets too low the UAS must be brought back immediately. This is to ensure that avoidable crashes due to power loss don't occur. There are preflight checks that occur for before each flight and maintenance that is conducted every day.*

*Operator error is avoided by the safety protocols discussed above as well as the stringent training requirements discussed in the following question.*

5. How experienced are the researchers with this UAS platform? What type and level of training in UAS operations have the operators received?

The Applicant responded with:

*NOAA has strict regulations for UAS operations. All pilots must take the written exam for private pilots in order to develop basic awareness of flight rules and regulations, safe flying practices, etc. They must pass the 2nd Class Medical Examination for Airmen to ensure that hearing, vision, and physical ability allow for safe piloting.*

*Pilots must then receive training on the specific platform they are going to pilot. So all pilots of the APH-22 have taken a 4-5 day training course that includes instruction on being compliant with FAA, NOAA and other agencies flight regulations, care and maintenance of the UAS, pre- and post flight checks, programming, and, of course, flight training. Flight training includes take offs and landing (on ground and in hand), aerial photography, and general flight operations.*

*Proficiency is maintained by research in the field and training in designated flying areas. For Hawaii, proficiency flights are conducted at Bellows Air Force Station.*

*All pilots will have experience using UAS in the NWHI or on other marine mammal projects on top of the training listed above.*

6. Please provide a standard recovery protocol for our review. How will water and land recovery be handled if there is an error with the drone operation?

The Applicant responded with:

*As discussed above there are a variety of safeguards that prevent the UAS from flying up and away. Therefore, landings are going to be generally straight down and either controlled by the pilot or the UAS software (in the case of broken communication link) or a crash due to a complete power failure or impact with a bird or cliff. All surveys, other than those at Tern Island, will be along the shoreline so any landings will be in a narrow band along the shore including the shallow water or a short distance behind the vegetation line.*

*If a water landing: The UAS will float and will be recovered by the safest means possible (i.e. wading out to retrieve or using a small boat to collect it).*

*If a terrestrial landing occurs: HMSRP staff are all experienced with working in the NWHI and mitigating impacts to natural and cultural resources. They are trained and practiced in avoiding*

*collapsing bird burrows (and what to do if it happens), to watch their steps to avoid stepping on chicks or eggs, to determine paths that allow the shortest possible transit while avoiding the greatest amount of impact/disturbance to birds, and to monitor for and avoid potential cultural sites.*

*Nihoa: The team is well experienced working on Nihoa. If the UAS lands on the beach, the team will attempt to land in our usual area and follow the shoreline to the beach to recover the platform. If the team is unable to safely get staff to the island an attempt will be made to recover the platform the following day or on the return leg of the cruise.*

*Mokumanamana: Flights will be conducted over the rocky platforms that monk seals haul out on. If the UAS ends up on one of these platforms we will attempt to land one person to retrieve the platform.*

*Tern Island: Collecting aerial imagery of degrading infrastructure at Tern Island will require some flights over the interior of the island. If during these flights the UAS lands in vegetated areas (bird habitat) our French Frigate Shoals field team will determine the best path with minimal impact to retrieve the platform. One person will retrieve the UAS.*

*For any unintended landing that occurs on the islands, researchers will document any impacts to natural and cultural resources with photos and data records and report it back to the MMB as soon as possible. In most cases this should be the same day as long as ships satellite communications are working.*

7. For the future, will this be a seasonal operation or year round?

The Applicant responded with:

*We can only speak to the NOAA HMSRP's needs, but others may want to use the platforms more broadly in the future. We are generally up in the NWHI from April/May to August/September. UAS operations will likely be a regular occurrence on our pick up and drop off cruises. Some platforms may be embedded in our field camps if there is a sufficiently important science or conservation question that we feel the UAS would be valuable in addressing.*

8. What efforts have been made to work with appropriate partners to increase efficiency and reduce duplicative research efforts?

The Applicant responded with:

*NOAA Fisheries is the only agency permitted to conduct research and monitoring of monk seals using UAS so there will be no duplicative work in that regard. We brief our PMNM MMB each year about what our plans for the upcoming year in order to offer an opportunity to make use of the platforms that we will have deployed.*

COMMENTS:

1. In the event of a drone malfunction over land at Nihoa, access is at Adams Bay via a rocky step landing, not the beach. You're correct in noting that it is not an easy landing. Depending on conditions (swell, cautious boat driver), you might not be able to get on land. Drone recovery might be possible once they were on island, but it might be tough to get on the island.

The Applicant responded with:

*Yes, as mentioned above, the team is well experienced working on Nihoa. If the UAS lands on the beach, the team will attempt to land in our usual area and follow the shoreline to the beach to recover the platform. If the team is unable to safely get staff to the island an attempt will be made to recover the platform the following day or on the return leg of the cruise.*

2. Few resources would be impacted in the intended survey areas along the coast. Flights overland could harass seabirds or crash into sensitive resources.

The Applicant responded with:

*That is our hope. Interactions with birds and other wildlife will be closely monitored and should significant interactions occur operations will be halted. Previous observations have demonstrated that while some birds are temporarily disturbed by launching of the platforms they return to roost shortly afterwards. We will minimize repeat launches near areas of birds so as to not repeatedly disturb the same individuals. Birds have demonstrated curiosity in the APH-22 during flight but have not come into contact with it. We will continue to avoid large groups of birds.*

*For any unintended landing that occurs on the islands, researchers will document any impacts to natural and cultural resources with photos and data records and report it back to the MMB as soon as possible. In most cases this should be the same day as long as ships satellite communications are working.*

**Comments received from the Native Hawaiian community are summarized as follows:**

Cultural reviews support the acceptance of this application. No concerns were raised.

**Comments received from the public are summarized as follows:**

No comments were received from the public on this application.

**Additional reviews and permit history:**

Are there other relevant/necessary permits or environmental reviews that have or will be issued with regard to this project? (e.g. MMPA, ESA, EA)      Yes       No

If so, please list or explain:

- An informal review of all aforementioned activities following section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA; 16 U.S.C. 1855(b)) was initiated on June 7, 2016 by NOAA National Marine Fisheries Service (NMFS) Pacific

Islands Regional Office (PIRO) for Essential Fish Habitat (EFH). NMFS concurs with the ONMS determination that activities to be carried out under the PMNM permit 2016-019 Littnan are not likely to adversely affect ESA-listed marine species. The outcome of this consultation may require the applicant to adhere to other NMFS-prescribed conditions. Such conditions would be reflected in the PMNM permit, prior to issuance.

- An informal consultation pursuant to section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. §1531et seq.) was initiated on June 21, 2016 with the National Marine Fisheries Service (NMFS). NMFS concurred with NOS ONMS determination that the proposed action may affect, but is not likely to adversely affect ESA-listed marine species, including Hawaiian monk seals (*Monachus schauinslandi*), green sea turtles (*Chelona mydas*), hawksbill sea turtles (*Eretmochelys imbricata*), North Pacific loggerhead sea turtles (*Caretta caretta*), olive ridley sea turtles (*Lepidochelys olivacea*), leatherback sea turtles (*Dermochelys coriacea*), humpback whales (*Megaptera novaeangliae*), sperm whales (*Physeter macrocephalus*), fin whales (*Balaenoptera physalus*), blue whales (*Balaenoptera musculus*), sei whales (*Balaenoptera borealis*), north pacific right whales (*Eubalaena japonica*), and proposed and designated Hawaiian monk seal critical habitat (NMFS letter of concurrence received July 5, 2016).
- MMPA research permit no. 16632-00 issued to the Hawaiian Monk Seal Research Program National Marine Fisheries Service
- FAA Certificate of Authorization (COA) to the Hawaiian Monk Seal Research Program
- The Department has made an exemption determination for this permit in accordance chapter 343, HRS, and Chapter 11-200, HAR. See Attachment (“DECLARATION OF EXEMPTION FROM THE PREPARATION OF AN ENVIRONMENTAL ASSESSMENT UNDER THE AUTHORITY OF CHAPTER 343, HRS AND CHAPTER 11-200 HAR, FOR PAPAHAŌNAUMOKUĀKEA MARINE NATIONAL MONUMENT CONSERVATION AND MANAGEMENT PERMIT TO DR. CHARLES LITNAN, NOAA FISHERIES, PACIFIC ISLANDS FISHERIES SCIENCE CENTER, FOR ACCESS TO STATE WATERS TO CONDUCT UNMANNED AERIAL SYSTEM MONITORING SURVEYS OF THE NATURAL RESOURCES OF PMNM UNDER PERMIT PMNM-2016-019”)

Has Applicant been granted a permit from the State in the past? Yes  No

If so, please summarize past permits:

- The Applicant was granted permit PMNM-2010-030 to conduct similar activities. The Applicant was also granted permits PMNM-2008-016, PMNM-2010-018, PMNM-2009-030, PMNM-2011-029, to conduct associated Hawaiian monk seal recovery work in 2008, 2009, 2011, and PMNM-2015-019 to conduct UAS surveys in 2015.

Have there been any a) violations: Yes  No

b) Late/incomplete post-activity reports: Yes  No

Are there any other relevant concerns from previous permits? Yes  No

STAFF OPINION:

PMNM staff is of the opinion that Applicant has properly demonstrated valid justifications for his application and should be allowed to enter the NWHI State waters and to conduct the activities

therein as specified in the application with certain special instructions and conditions, which are in addition to the Papahānaumokuākea Marine National Monument Research Permit General Conditions. All suggested special conditions have been vetted through the legal counsel of the Co-Trustee agencies (see Recommendation section).

MONUMENT MANAGEMENT BOARD OPINION:

The MMB is of the opinion that the Applicant has met the findings of Presidential Proclamation 8031 and this activity may be conducted subject to completion of all compliance requirements. The MMB concurs with the special conditions recommended by PMNM staff.

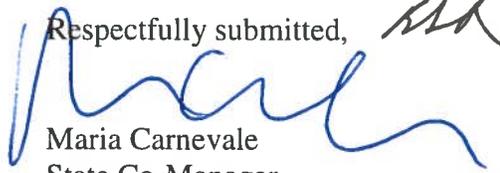
RECOMMENDATION:

That the Board authorize and approve a Research Permit to Dr. Charles Littnan, Pacific Islands Fisheries Science Center, with the following special conditions:

1. That the Board declare that the actions which are anticipated to be undertaken under this permit will have little or no significant effect on the environment and is therefore exempt from the preparation of an environmental assessment.
2. Upon the finding and adoption of the department's analysis by the Board, that the Board delegate and authorize the Chairperson to sign the declaration of exemption for purposes of recordkeeping requirements of chapter 343, HRS, and chapter 11-200, HAR.
3. That the permittee provide, to the best extant possible, a summary of their Monument access, including, but not limited to, any initial findings to the DLNR for use at educational institutions and outreach events.
4. This permit is not to be used for nor does it authorize the sale of collected organisms. Under this permit, the authorized activities must be for noncommercial purposes not involving the use or sale of any organism, by-products, or materials collected within the Monument for obtaining patent or intellectual property rights.
5. The permittee may not convey, transfer, or distribute, in any fashion (including, but not limited to, selling, trading, giving, or loaning) any coral, live rock, or organism collected under this permit without the express written permission of the Co-Trustees.
6. To prevent introduction of disease or the unintended transport of live organisms, the permittee must comply with the disease and transport protocol attached to this permit.
7. Tenders and small vessels must be equipped with engines that meet EPA emissions requirements.

8. Refueling of tenders and all small vessels must be done at the support ships and outside the confines of lagoons or near-shore waters in the State Marine Refuge.
9. No fishing is allowed in State Waters except as authorized under State law for subsistence, traditional and customary practices by Native Hawaiians.

Respectfully submitted, *MC*



Maria Carnevale  
State Co-Manager  
Papahānaumokuākea Marine National Monument

APPROVED FOR SUBMITTAL



SUZANNE D. CASE  
Chairperson

**Papahānaumokuākea Marine National Monument**  
CONSERVATION AND MANAGEMENT Permit Application

**NOTE:** *This Permit Application (and associated Instructions) are to propose activities to be conducted in the Papahānaumokuākea Marine National Monument. The Co-Trustees are required to determine that issuing the requested permit is compatible with the findings of Presidential Proclamation 8031. Within this Application, provide all information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Papahānaumokuākea Marine National Monument (Monument).*

**ADDITIONAL IMPORTANT INFORMATION:**

- Any or all of the information within this application may be posted to the Monument website informing the public on projects proposed to occur in the Monument.
- In addition to the permit application, the Applicant must either download the Monument Compliance Information Sheet from the Monument website OR request a hard copy from the Monument Permit Coordinator (contact information below). The Monument Compliance Information Sheet must be submitted to the Monument Permit Coordinator after initial application consultation.
- Issuance of a Monument permit is dependent upon the completion and review of the application and Compliance Information Sheet.

**INCOMPLETE APPLICATIONS WILL NOT BE CONSIDERED**

Send Permit Applications to:

Papahānaumokuākea Marine National Monument Permit Coordinator  
6600 Kalaniana'ole Hwy. # 300

Honolulu, HI 96825

nwhipermit@noaa.gov

PHONE: (808) 397-2660      FAX: (808) 397-2662

**SUBMITTAL VIA ELECTRONIC MAIL IS PREFERRED BUT NOT REQUIRED. FOR ADDITIONAL SUBMITTAL INSTRUCTIONS, SEE THE LAST PAGE.**

## **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:** Charles Littnan

**Affiliation:** NOAA Fisheries, Pacific Islands Fisheries Science Center, Hawaiian Monk Seal Research Program

**Permit Category:** Conservation and Management

**Proposed Activity Dates:** 8/1/16-7/31/17

**Proposed Method of Entry (Vessel/Plane):** NOAA RV Oscar Elton Sette or Hi'ialakai, Midway Flight

**Proposed Locations:** Nihoa, Mokumanamana, French Frigate Shoals, Laysan Island, Lisianski Island, Pearl and Hermes Reef, Midway Atoll

**Estimated number of individuals (including Applicant) to be covered under this permit:** 4

**Estimated number of days in the Monument:** 56

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

a.) The proposed activity would...  
Use the APH-22 Hexacopter for environmental and natural resource monitoring in the Northwestern Hawaiian Islands (NWHI). Specifically, the unmanned aerial system (UAS) will support monitoring and surveying of marine mammals and marine debris (and potentially other flora and fauna) in the areas of Nihoa, Mokumanamana, French Frigate Shoals, Laysan, Lisianski, Pearl and Hermes Reef and Midway Atoll.

b.) To accomplish this activity we would ....  
Utilize the UAS to meet the resource protection and management requirements of the Papahānaumokuākea Marine National Monument. We will deploy (hand launch) the UAS platform to survey select sites within the NWHI for Hawaiian monk seal population and health assessments, marine debris detection, and surveying Tern Island to document entrapment threats to wildlife. The UAS would fly at altitudes below 500 feet. Specific altitudes at certain locations will vary and are identified below.

Specific goals for this project include:

- 1) Continue to assess the ability of the systems to operate discreetly with minimal disturbance to sensitive seabird colonies or marine mammals.
- 2) Conduct population surveys of monk seals using UAS primarily at Nihoa and Mokumanamana.
- 3) Conduct aerial survey of Tern Island to assess degradation of island infrastructure and identify entrapment and other hazards to wildlife.
- 4) Develop techniques for photogrammetry (body condition assessment) for monk seals.
- 5) Potentially other efforts as requested by PMNM partners.

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

Providing the ability to survey resources on the remote islands without (1) interference; (2) the potential for the introduction of invasive species; and (3) human disturbance to the natural resources. The UAS would increase the monitoring and surveying capacity in the Monument. This effort will also ensure that counts of Hawaiian monk seals are successfully completed each year at Nihoa and Mokumanamana. These two locations account for 20% of the NWHI population of seals and have become important populations. Limited access to these sites undermine our ability to estimate population trends at Necker and Mokumanamana and develop survival enhancement strategies for monk seals across the archipelago.

**Other information or background:**

The UAS will be launched and recovered from land, the NOAA Ship, Oscar Elton Sette, or one of the ships' launches and/or rigid hulled inflatables and flown at altitudes below 500 feet. Specific altitudes and special considerations for each location are specified below.

**Section A - Applicant Information**

**1. Applicant**

Name (last, first, middle initial): Charles Littnan

Title: Lead Scientist, NOAA Fisheries, Pacific Islands Fisheries Science Center,  
Hawaiian Monk Seal Research Program

**1a. Intended field Principal Investigator (See instructions for more information):**  
Charles Littnan

**2. Mailing address (street/P.O. box, city, state, country, zip):**  
Hawaiian Monk Seal Research Program

[Redacted]

[Redacted]

[Redacted]

[Redacted]

For students, major professor's name, telephone and email address:

**3. Affiliation (institution/agency/organization directly related to the proposed project):**  
NOAA

**4. Additional persons to be covered by permit. List all personnel roles and names (if known at time of application) here (e.g. John Doe, Research Diver; Jane Doe, Field Technician):**

Jessie Lopez, JIMAR, APH-22 Pilot

Mark Sullivan, JIMAR, APH-22 Pilot

TBD, NOAA Corps, APH-22 Pilot

CONSERVATION & MANAGMENT

**Section B: Project Information**

**5a. Project location(s):**

- |  |  |   |                                     |
|--|--|---|-------------------------------------|
| <input checked="" type="checkbox"/> Nihoa Island                 | <input checked="" type="checkbox"/> Land-based | <input checked="" type="checkbox"/> Shallow water | <input type="checkbox"/> Deep water |
| <input checked="" type="checkbox"/> Necker Island (Mokumanamana) | <input checked="" type="checkbox"/> Land-based | <input checked="" type="checkbox"/> Shallow water | <input type="checkbox"/> Deep water |
| <input checked="" type="checkbox"/> French Frigate Shoals        | <input checked="" type="checkbox"/> Land-based | <input checked="" type="checkbox"/> Shallow water | <input type="checkbox"/> Deep water |
| <input type="checkbox"/> Gardner Pinnacles                       | <input type="checkbox"/> Land-based            | <input type="checkbox"/> Shallow water            | <input type="checkbox"/> Deep water |
| <input type="checkbox"/> Maro Reef                               |  |   |                                     |
| <input checked="" type="checkbox"/> Laysan Island                | <input checked="" type="checkbox"/> Land-based | <input checked="" type="checkbox"/> Shallow water | <input type="checkbox"/> Deep water |
| <input checked="" type="checkbox"/> Lisianski Island, Neva Shoal | <input checked="" type="checkbox"/> Land-based | <input checked="" type="checkbox"/> Shallow water | <input type="checkbox"/> Deep water |
| <input checked="" type="checkbox"/> Pearl and Hermes Atoll       | <input checked="" type="checkbox"/> Land-based | <input checked="" type="checkbox"/> Shallow water | <input type="checkbox"/> Deep water |
| <input checked="" type="checkbox"/> Midway Atoll                 | <input checked="" type="checkbox"/> Land-based | <input checked="" type="checkbox"/> Shallow water | <input type="checkbox"/> Deep water |
| <input type="checkbox"/> Kure Atoll                              | <input type="checkbox"/> Land-based            | <input type="checkbox"/> Shallow water            | <input type="checkbox"/> Deep water |
| <input type="checkbox"/> Other                                   |  |   |                                     |

**Ocean Based**

NOTE: There is a fee schedule for people visiting Midway Atoll National Wildlife Refuge via vessel and aircraft.

Location Description: All missions will be launched from a small boat nearshore or from the beach (see below). Surveys can occur at any island or islet at the locations above. Shallow reef may be surveyed as well.

**5b. Check all applicable regulated activities proposed to be conducted in the Monument:**

- Removing, moving, taking, harvesting, possessing, injuring, disturbing, or damaging any living or nonliving Monument resource
- Drilling into, dredging, or otherwise altering the submerged lands other than by anchoring a vessel; or constructing, placing, or abandoning any structure, material, or other matter on the submerged lands
- Anchoring a vessel
- Deserting a vessel aground, at anchor, or adrift
- Discharging or depositing any material or matter into the Monument
- Touching coral, living or dead
- Possessing fishing gear except when stowed and not available for immediate use during passage without interruption through the Monument
- Attracting any living Monument resource
- Sustenance fishing (Federal waters only, outside of Special Preservation Areas, Ecological Reserves and Special Management Areas)
- Subsistence fishing (State waters only)
- Swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area

**\*\*This was selected as we may need to retrieve platform from ocean in case of water landing.**

**6. Purpose/Need/Scope *State purpose of proposed activities:***

The rich biodiversity of the PMNM stretches from the tops of basalt cliffs to the depths of the ocean. Extensive coral reefs found are home to over 7,000 marine species, one quarter of which are endemic to Hawaii. Many of the islands and shallow water environments are important habitats for rare species such as the threatened green turtle and the endangered Hawaiian monk seal, as well as the 14 million seabirds representing 22 species that breed and nest there. Land areas also provide a home for numerous plants and four species of bird found nowhere else in the world, including the world's most endangered duck, the Laysan duck. The research, management and conservation of many of these species is reliant on evolving new tools to aid partner agencies to conduct their work more efficiently while reducing impacts and disturbance to resources. UAS platforms could be incorporated into numerous monitoring and research programs within the PMNM. This mission will continue work conducted in 2014 and 2015 to assess the efficacy of UAS to aid in marine debris and marine mammal monitoring efforts, as well as habitat mapping in the Monument. These collection of images can help support a broad range of resource protection and management issues. In addition, the system is able to operate discreetly with minimal disturbance to sensitive seabird colonies or marine mammals.

The primary focus of this mission will be monk seal population and health assessment as well as documenting the entrapment threats at Tern Island. Additionally surveys will include marine debris monitoring and potentially other missions requested by PMNM partners.

\*Considering the purpose of the proposed activities, do you intend to film / photograph federally protected species? Yes  No

For a list of terrestrial species protected under the Endangered Species Act visit:

<http://www.fws.gov/endangered/>

For a list of marine species protected under the Endangered Species Act visit:

<http://www.nmfs.noaa.gov/pr/species/esa/>

For information about species protected under the Marine Mammal Protection Act visit:

<http://www.nmfs.noaa.gov/pr/laws/mmpa/>

**7. Answer the Findings below by providing information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Monument:**

The Findings are as follows:

a. How can the activity be conducted with adequate safeguards for the cultural, natural and historic resources and ecological integrity of the Monument?

In 2014 and 2015, the UAS research team (including members from NOAA, USFWS and other partners) demonstrated that the PUMA (fixed wing plane) and APH-22 (multi-rotor aircraft) systems could operate with virtually no impacts to cultural and natural resources within the Monument. As in 2014 and 2015, the UAS will be operated by trained NOAA staff and affiliates and all relevant Monument Best Management Practices and protocols specific to deployment and retrieval will be followed. Interactions with birds and other wildlife will be closely monitored and should significant interactions occurs operations will be halted. Previous observations have demonstrated that while some birds are temporarily disturbed by launching of the platforms they return to roost shortly afterwards. We will minimize repeat launches near areas of birds so as to not repeatedly disturb the same individuals. Birds have demonstrated curiosity in the APH-22 during flight but have not come into contact with it. We will continue to avoid large groups of birds.

Different from previous years, we are requesting the use of the APH-22 at both Nihoa and Mokumanamana. Both of these islands and the cultural sites upon them are of great significance to the native Hawaiian community. Past discussions have identified at least two areas of concerns to Hawaiian cultural practitioners: 1) capturing images of cultural sites and 2) generally operating over the islands themselves as it is the land, sea and air around the islands that are sacred. We hope to gain access to conduct operations by only conducting flights over the coast (rocky shelves and beaches) of the two islands. There is no need to fly over the upper reaches of the islands and we will not photograph any cultural sites. We can also work to minimize the amount of time for operations. We will be engaging with OHA and the PMNM Cultural Working Group to further this discussion.

All photos and imagery captured by the UAS will be used internally for purposes of conservation and management activities. Images will be shared with all Co-Trustee agencies upon request and not disseminated for public consumption without first ensuring the appropriateness, from a cultural and natural resource perspective, of the information being disseminated.

b. How will the activity be conducted in a manner compatible with the management direction of this proclamation, considering the extent to which the conduct of the activity may diminish or enhance Monument cultural, natural and historic resources, qualities, and ecological integrity, any indirect, secondary, or cumulative effects of the activity, and the duration of such effects? The UAS operates in a discreet manner, flying at altitudes of 500 feet or less, though most operations are lower. There is no disturbance to marine mammals and little disturbance to seabird colonies during deployment (only during launch when on land near bird roosts). The data captured would be managed by NOAA and shared with other managing agencies and aid in management decision-making.

As stated above, we want to ensure that these activities are designed and undertaken in a way that accomplishes the conservation goals while incorporating input from the Native Hawaiian community to ensure they occur with appropriate level of sensitivity and respect. To this end we have reached out to the Office of Hawaiian Affairs to discuss the project and receive any initial input or concerns. We look forward to responding to any questions from the Cultural Working Group or other partners to ensure that this mission is thoroughly and assessed and refined as appropriate. If any partners would like a briefing or have a discussion we are available.

c. Is there a practicable alternative to conducting the activity within the Monument? If not, explain why your activities must be conducted in the Monument.

The work proposed here is intended to be a regular part of Hawaiian monk seal research and recovery activities. The recovery of Hawaiian monk seals requires us to conduct our work in the NWHI. The addition of Nihoa and Mokumanamana is especially important as the populations of monk seals on these two islands have grown more important to the species recovery (two sites that have remained stable or shown growth in the last 10 years). However, our data at the two sites is limited due to limited landing opportunities to do surveys (often sea conditions prevent our ability to conduct surveys). Multiple years can pass where we are unable to monitor the population. This impacts our data but also causes us to evidence of dangers to the population such as male aggression. The use of UAS ensures that we could successfully get population counts during each visit to the NWHI in the future.

d. How does the end value of the activity outweigh its adverse impacts on Monument cultural, natural and historic resources, qualities, and ecological integrity?

There is little evidence that the UAS platforms have lasting/significant adverse impacts to any Monument resources. Ultimately the platforms will likely allow for greater monitoring while reducing the impacts of human presence. These tools will provide better assessment of animal condition and enhance the data quality collected on the monk seal population which drives our recovery decision making process. These tools will also be valuable for monitoring other flora and fauna throughout the Monument.

e. Explain how the duration of the activity is no longer than necessary to achieve its stated purpose.

The activity will occur in conjunction with other monk seal research and recovery activities. The schedule of operations are as followed:

1. Hawaiian Monk Seal Camp Pick-Up Cruise approximately Aug 3 - 24. This would include operations at Nihoa, Mokumanamana, French Frigate Shoals, Laysan, Lisianski, and Pearl and Hermes Reef.
2. Midway Research Trip, approximately two weeks with the date to be determined (possibly September). This would be done in conjunction with a larger study on the ecology and health status of Midway monk seals. This trip will be planned in coordination with Midway Atoll National Wildlife Refuge.

3. Hawaiian Monk Seal Camp Deployment, three week cruise on Hi'ialakai. Dates to be determined but likely in April or May 2017. This would include operations at Nihoa, Mokumanamana, French Frigate Shoals, Laysan, Lisianski, and Pearl and Hermes Reef.

f. Provide information demonstrating that you are qualified to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.

Charles Littnan is the head of NOAA's Hawaiian Monk Seal Research Program, the primary group charged with understanding and recovering this endangered species. He has participated in two field seasons using UAS in the NWHI and is qualified to fly the APH-22. The HMSRP intends to use UAS as a future tool to aid in their research, monitoring and emergency response of monk seals.

All pilots and partners associated with this project will have training and experience relevant to the role they will play on the team.

g. Provide information demonstrating that you have adequate financial resources available to conduct and complete the activity and mitigate any potential impacts resulting from its conduct. The applicant has adequate financial resources available to conduct the proposed management activities. Federal funding is provided through congressional appropriation.

h. Explain how your methods and procedures are appropriate to achieve the proposed activity's goals in relation to their impacts to Monument cultural, natural and historic resources, qualities, and ecological integrity.

This mission will be following the same protocols and considerations that were developed for the UAS mission in 2015. The methods and procedures used in the conservation and management activities by the permit applicant are appropriate to achieve the proposed activity's goals. All activities proposed are required for effective management of the Monument and are conducted in a way that minimizes impact as required by law. Management activities assist the applicants to protect the Monument natural, historic and cultural resources, qualities, and ecological integrity.

i. Has your vessel been outfitted with a mobile transceiver unit approved by OLE and complies with the requirements of Presidential Proclamation 8031?  
All NOAA Vessels are equipped with required technologies.

j. Demonstrate that there are no other factors that would make the issuance of a permit for the activity inappropriate.

There are no other factors that would make the issuance of a permit for the activity inappropriate.

#### **8. Procedures/Methods:**

The APH-22 has a pilot and an observer and is launched from the observer's hand. Once launched the observer monitors the base station and scans the sky to see if there is any air traffic requiring the landing of the UAS. There will also be a wildlife observer who will note animal disturbance or interactions with birds in the air. The system will fly for approximately 15-20 minutes and will remain within the pilot's visual range (1-nm). The rechargeable battery will be replaced for each mission.

#### **General Operation Guidelines:**

Daylight hours only

Winds less than 25kts

Only NOAA Certified Pilots trained specifically for the APH-22 will operate the system.

Operations at Midway and Tern Island will require special authorizations and requirements that will be developed with NOAA, USFWS and the FAA over the next several months. Operating within 5 miles of an airport requires a licensed pilot so these operations will not occur unless all approvals have been received.

#### **Nihoa Protocol:**

Flights at Nihoa will only occur in three shoreline areas: the rock ledges near the landing site in Adam's Bay, the sandy beach and nearby rock ledges in Adam's Bay, and the rock ledge on the western side of the island (see attached map). No flights will be made over the island except in the identified shoreline zones.

Launches will occur via small boat located between 50 - 500 feet offshore from the survey location. Launch point will be determined by swell and other environmental conditions. The platform will be flown towards the island between 100-200 feet in altitude depending on wind conditions and bird activity. Aerial photography of animals and haul out areas will occur between 30 - 100 feet depending on wind conditions.

If the team lands on Nihoa to conduct landbased monk seal assessments then the APH-22 may be launched on land to survey the sandy beach (primary monk seal haul out) to photo-identify seals. The same altitudes described above will be in place for these flights.

Estimated number of flights and flight time for Nihoa surveys (this may change based on environmental conditions and number of seals): 5 flights, 75 minutes.

**Mokumanamana Protocol:**

Flights at Mokumanamana will only occur at five shoreline locations highlighted in the attached map. No flights will be made over the island except in the identified shoreline zones.

Launches will only occur via small boat located between 50 - 500 feet offshore from the survey location. Launch point will be determined by swell and other environmental conditions. The platform will be flown towards the island between 100-200 feet in altitude depending on wind conditions and bird activity. Aerial photography of animals and haul out areas will occur between 30 - 100 feet depending on wind conditions.

Estimated number of flights and flight time for Mokumanamana surveys (this may change based on environmental conditions and number of seals): 6 flights, 60 minutes.

**All Other Sites Protocol:**

All surveys at other locations will be land-based launches. Maximum altitude will be 500 feet and will be generally during transit. Habitat mapping and marine debris surveys will generally occur between 200 - 400 feet. Animal photo-identification and disturbance monitoring will occur between 30 - 165 feet. Seal condition studies will occur between 30 - 100 feet.

**NOTE: If land or marine archeological activities are involved, contact the Monument Permit Coordinator at the address on the general application form before proceeding.**

**9a. Collection of specimens - collecting activities (would apply to any activity): organisms or objects (List of species, if applicable, attach additional sheets if necessary):**

Common name:  
N/A

Scientific name:

# & size of specimens:

Collection location:

Whole Organism  Partial Organism

**9b. What will be done with the specimens after the project has ended?**

N/A

**9c. Will the organisms be kept alive after collection?**  Yes  No

N/A

• General site/location for collections:

N/A

• Is it an open or closed system?  Open  Closed

N/A

• Is there an outfall?  Yes  No

N/A

• Will these organisms be housed with other organisms? If so, what are the other organisms?

N/A

• Will organisms be released?

N/A

**10. If applicable, how will the collected samples or specimens be transported out of the Monument?**

N/A

**11. Describe collaborative activities to share samples, reduce duplicative sampling, or duplicative research:**

N/A

**12. List all specialized gear and materials to be used in this activity:**

APH-22 Hexacopter

Omni RF controller unit

Gimbaled Camera System

Battery Charger

Computer Base Station

LiPo Batteries

Field Repair Kits

**13. List all Hazardous Materials you propose to take to and use within the Monument:**  
lithium polymer batteries.

**14. Describe any fixed installations and instrumentation proposed to be set in the Monument:**

NONE

**15. Provide a time line for sample analysis, data analysis, write-up and publication of information:**

Photographs and video can be available to PMNM partners immediately on request.

Data analysis for population assessment will occur by January 15<sup>th</sup> 2017 for our annual population summaries.

Analysis of condition estimates will occur during 2017, but won't be published until later (dependent on sample size etc.)

Report on aerial survey of Tern Island will be completed and provided to PMNM partners in early 2017.

A summary of the total number of flights, flight time, bird disturbance/interactions, seal disturbance, and other specific data will be available shortly after each cruise and will be provided to the PMNM MMB and other stakeholders who are interested. A final report will be provided at the conclusion of the permit as required by the PMNM protocols.

**16. List all Applicant's publications directly related to the proposed project:**

Samantha Brooke, David Graham, Todd Jacobs, Charles Littnan, Mark Manuel, Robert O'Conner (2015). Testing marine conservation applications of unmanned aerial systems (UAS) in a remote marine protected area. Journal of Unmanned Vehicle Systems, 3(4): 237-251, 10.1139/juvs-2015-0011

With knowledge of the penalties for false or incomplete statements, as provided by 18 U.S.C. 1001, and for perjury, as provided by 18 U.S.C. 1621, I hereby certify to the best of my abilities under penalty of perjury of that the information I have provided on this application form is true and correct. I agree that the Co-Trustees may post this application in its entirety on the Internet. I understand that the Co-Trustees will consider deleting all information that I have identified as "confidential" prior to posting the application.



Signature

3/21/2016

Date

**SEND ONE SIGNED APPLICATION VIA MAIL TO THE MONUMENT OFFICE BELOW:**

Papahānaumokuākea Marine National Monument Permit Coordinator  
6600 Kalaniana'ole Hwy. # 300  
Honolulu, HI 96825  
FAX: (808) 397-2662

**DID YOU INCLUDE THESE?**

- Applicant CV/Resume/Biography
- Intended field Principal Investigator CV/Resume/Biography
- Electronic and Hard Copy of Application with Signature
- Statement of information you wish to be kept confidential
- Material Safety Data Sheets for Hazardous Materials

**Nihoa Island:** Three survey sites are highlighted in yellow. All flights below 200ft.



**Mokumanamana:** The five locations are highlighted in yellow. All flights below 200 ft.

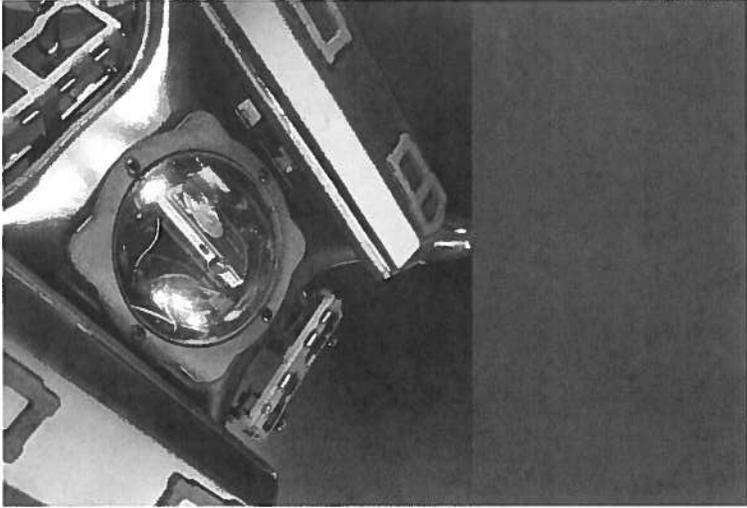


# Specifications for UAS Platform: APH-22

Prepared for PMNM Permit Application for Aug. 2016  
and April/May 2017 Operations



# Utilizing unmanned aerial systems (UAS) for natural resource monitoring and marine debris detection in the Papahānaumokuākea Marine National Monument

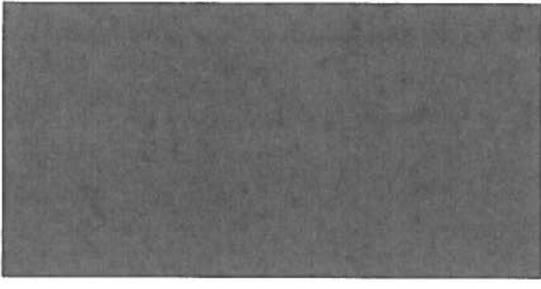


Hermes Atoll in 2015. It has been used to study marine mammals and birds from Canada to the Antarctic. These links demonstrate the platform in action in research with sea lions (<http://1.usa.gov/1KqknOb>) and killer whales (<http://bit.ly/1EFnXTO>):

The use of UAS is to help develop tools to fulfill the resource protection and management requirements of the Papahānaumokuākea Marine National Monument (PMNM). UAS platforms will be used to survey select sites within the NWHI for marine mammal activity as well as marine debris. Other missions may be added. We will be using multi-rotor UAS platform, APH-22.

## **APH-22**

The APH-22 is a hexacopter regular used by NOAA and other agencies for a variety of work. It was used to conduct monk seal and marine debris surveys at Laysan and Lisianski Islands and Pearl and



## **APH-22 (Hexacopter)**

**Range:** Line of sight

**Endurance:** 18-25 min

**Speed:** 20 m/sec. (39 Knots)

**Wing Span:** 32.4 in

**Length:** 32.4 in

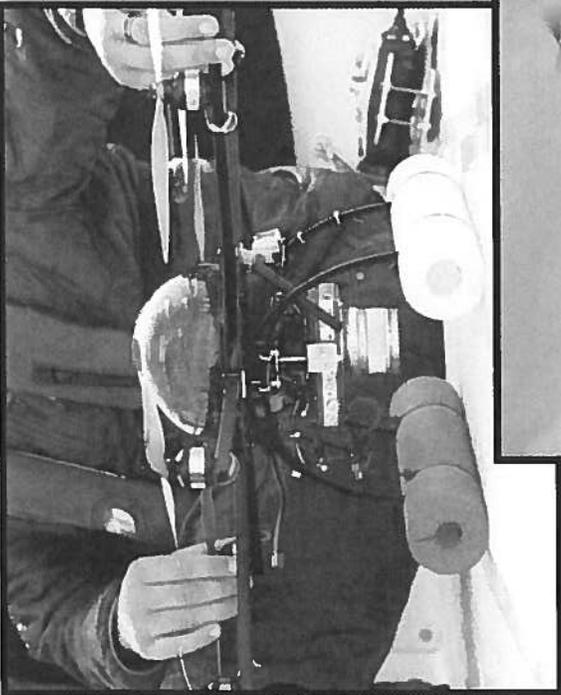
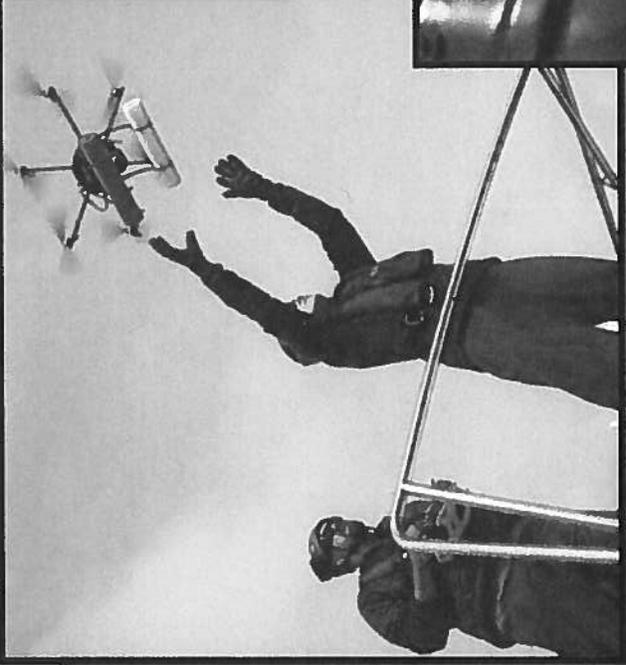
**Weight:** 6 lbs (2.7 kg)

**GCS:** Laptop or Tablet  
Computer with Radio  
Telemetry (915Mhz)

**Launch Method:** Vertical  
Take Off and Landing  
(VTOL)

**Recovery Method:** VTOL





## **Papahānaumokuākea Marine National Monument Compliance Information Sheet**

**1. Updated list of personnel to be covered by permit. List all personnel names and their roles here (e.g. John Doe, Diver; Jane Doe, Field Technician, Jerry Doe, Medical Assistant):**

Charles Littnan, NOAA Fisheries, Pilot  
Jake Barbaro, NOAA Fisheries, Pilot  
Stacie Robinson, NOAA Fisheries, Visual Observer  
Mike Burns, JIMAR Affiliate, Visual Observer

**2. Specific Site Location(s): (Attach copies of specific collection locations):**

Nihoa, main beach and lava shelves that seal haul out on.  
Mokumanamana, lava shelves that seals haul out on.  
French Frigate Shoals, Tern Island

**3. Other permits (list and attach documentation of all other related Federal or State permits):** NOAA ESA/MMPA #16632

**3a. For each of the permits listed, identify any permit violations or any permit that was suspended, amended, modified or revoked for cause. Explain the circumstances surrounding the violation or permit suspension, amendment, modification or revocation.** None

**4. Funding sources (Attach copies of your budget, specific to proposed activities under this permit and include funding sources. See instructions for more information):** Federal Government

**5. Time frame:**

Activity start: Aug 4, 2016  
Activity completion: Aug. 6, 2016

Note this is only for the upcoming cruise in August. Additional flights may be undertaken during the deployment cruise in 2017. Will update with a new compliance sheet at that time.

Dates actively inside the Monument:  
From: Aug 4, 2016

To: Aug 7, 2016

Describe any limiting factors in declaring specific dates of the proposed activity at the time of application: Weather or ship delays may change timing.

Personnel schedule in the Monument:

All personnel will be on the following schedule:

Aug 4 – Nihoa

Aug 5 – Mokumanana

Aug 6 – FFS, Tern Island

Aug 7 Transit out of Monument

**6. Indicate (with attached documentation) what insurance policies, bonding coverage, and/or financial resources are in place to pay for or reimburse the Monument trustees for the necessary search and rescue, evacuation, and/or removal of any or all persons covered by the permit from the Monument:** Federal Government

**7. Check the appropriate box to indicate how personnel will enter the Monument:**

- Vessel  
 Aircraft

Provide Vessel and Aircraft information: NOAA RV Oscar Elton Sette

**8. The certifications/inspections (below) must be completed prior to departure for vessels (and associated tenders) entering the Monument. Fill in scheduled date (attach documentation):**

- Rodent free, Date:  
 Tender vessel, Date:  
 Ballast water, Date:  
 Gear/equipment, Date:  
 Hull inspection, Date:

**9. Vessel information (NOTE: if you are traveling aboard a National Oceanic and Atmospheric Administration vessel, skip this question):**

Vessel name:

Vessel owner:

Captain's name:

IMO#:  
Vessel ID#:  
Flag:  
Vessel type:  
Call sign:  
Embarkation port:  
Last port vessel will have been at prior to this embarkation:  
Length:  
Gross tonnage:  
Total ballast water capacity volume (m3):  
Total number of ballast water tanks on ship:  
Total fuel capacity:  
Total number of fuel tanks on ship:  
Marine Sanitation Device:  
Type:

Explain in detail how you will comply with the regulations regarding discharge in the Monument. Describe in detail. If applicable, attach schematics of the vessel's discharge and treatment systems:

Other fuel/hazardous materials to be carried on board and amounts:

Provide proof of a National Oceanic and Atmospheric Administration (NOAA) Office of Law Enforcement-approved Vessel Monitoring System (VMS). Provide the name and contact information of the contractor responsible for installing the VMS system. Also describe VMS unit name and type:

VMS Email:  
Inmarsat ID#:

\* Individuals MUST ENSURE that a type-approved VMS unit is installed and that its automatic position reports are being properly received by the NOAA OLE system prior to the issuance of a permit. To make sure your VMS is properly configured for the NOAA OLE system, please contact NOAA OLE at (808) 203-2503 or (808) 203-2500.

\* PERMITS WILL NOT BE ISSUED TO INDIVIDUALS ENTERING THE MONUMENT VIA VESSEL UNTIL NOAA OLE HAS CONTACTED THE MONUMENT PERMIT COORDINATOR WITH A 'POSITIVE CHECK' READING.

### **10. Tender information:**

On what workboats (tenders) will personnel, gear and materials be transported within the Monument? List the number of tenders/skiffs aboard and specific types of motors:

Will be utilizing the tenders/workboats that are aboard the Oscar Elton Sette.

### **Additional Information for Land Based Operations**

**11. Proposed movement of personnel, gear, materials, and, if applicable, samples:**

Minimal gear will need to be brought on shore and only at Tern Island. Will follow island quarantine policies. All equipment will be transported in new waterproof bags (not pelican cases). All equipment that can be frozen for 48 hrs will be before going on island. All electronics will be thoroughly cleaned to ensure no seeds or insects are carried on the equipment.

**12. Room and board requirements on island: None**

**13. Work space needs: None**

**DID YOU INCLUDE THESE?**

- Map(s) or GPS point(s) of Project Location(s), if applicable
- Funding Proposal(s)
- Funding and Award Documentation, if already received
- Documentation of Insurance, if already received
- Documentation of Inspections
- Documentation of all required Federal and State Permits or applications for permits

DAVID Y. IGE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF AQUATIC RESOURCES  
1151 PUNCHBOWL STREET, ROOM 330  
HONOLULU, HAWAII 96813

SUZANNE D. CASE  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA  
FIRST DEPUTY

JEFFREY PEARSON  
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT  
ENGINEERING  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAIKOOLAWA ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS

July 22, 2016

TO: Division of Aquatic Resources File

THROUGH: Suzanne D. Case, Chairperson

FROM: Maria Carnevale  
Papahānaumokuākea Marine National Monument

DECLARATION OF EXEMPTION FROM THE PREPARATION OF AN ENVIRONMENTAL ASSESSMENT UNDER THE AUTHORITY OF CHAPTER 343, HRS AND CHAPTER 11-200 HAR, FOR PAPAHAUNAUMOKUĀKEA MARINE NATIONAL MONUMENT RESEARCH PERMIT TO DR. CHARLES LITTNAN, NOAA FISHERIES, PACIFIC ISLANDS FISHERIES SCIENCE CENTER, FOR ACCESS TO STATE WATERS TO CONDUCT UNMANNED AERIAL SYSTEM MONITORING SURVEYS OF THE NATURAL RESOURCES OF PMNM UNDER PERMIT PMNM-2016-019.

The following permitted activities are found to be exempted from preparation of an environmental assessment under the authority of Chapter 343, HRS and Chapter 11-200, HAR:

Project Title:

Papahānaumokuākea Marine National Monument Research Permit to Dr. Charles Littnan, NOAA Fisheries, Pacific Islands Fisheries Science Center, for Access to State Waters to Conduct Unmanned Aerial System Monitoring Surveys of the Natural Resources of PMNM.

Permit Number: PMNM-2016-019

Project Description:

The research permit application, as described below, would allow entry and activities to occur in Papahānaumokuākea Marine National Monument, including the NWHI State waters from August 1, 2016 through July 31, 2017.

The Applicant proposes to conduct video camera surveys of Nihoa, Mokumanamana, French Frigate Shoals, Laysan, Lisianski, Pearl and Hermes Atoll, and Midway Atoll to conduct environmental monitoring and surveying activities in the Northwestern Hawaiian Islands.

The UAS proposed for use in these activities is the APH-22. The APH-22 is a vertical takeoff and landing unit, electric battery powered, multi-rotor hexacopter (contains six propellers, each

15 cm. length and 5.5 mm. width), weighing 6 lbs. with a total length of 32.4 in. It consists of a separate ground control station to provide remote control of the unit.

Deployment of the UAS would be conducted from land, aboard a separately permitted NOAA Ship (e.g. NOAA Ship OSCAR ELTON SETTE) or from its small boats. The APH-22 would be hand-launched from a level surface and retrieved from land as it cannot land in water. Only one UAS would be deployed at a time and the unit would remain within visual range and one mile of the remote operator at all times. The system would fly at altitudes below 500 feet. Each flight would be of 15-20 minutes in duration, occur only during daylight hours, in conditions with less than 25 knot winds, and operated only by NOAA certified pilots. A wildlife observer will be posted to note any animal disturbance or interactions with birds in the air during flight.

The system's low noise, ease of use, simplicity, low maintenance and reliability are all beneficial to marine research. The system is relatively inexpensive to operate and uses a rechargeable electric battery. Systems are durable, rugged for deployment to remote marine areas and repeat usage. These systems can fly for up to 2 hours per battery charge and cover a range of about 50 square miles per flight. However, the flights for this permit would range between 15-20 minutes. The UAS systems are cheaper, safer and 'greener' than conducting manned operations. In addition to UAS activities, the Applicant will also be swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area.

All photos and imagery captured by the UAS will be used internally for purposes of conservation and management activities. Images will be shared with all Co-Trustee agencies upon request and not disseminated for public consumption without first ensuring the appropriateness. The Applicant has engaged with OHA and the PMNM Cultural Working Group to discuss concerns on surveys taking place at Nihoa and Mokumanamana. These concerns were mainly: 1) capturing images of cultural sites and 2) generally operating over the islands themselves. To address these concerns, surveys at Nihoa and Mokumanamana will take place only over the coastline (rocky shelves and beaches), with no flights occurring over the upper reaches of the islands and no photographing of cultural sites.

The proposed activities are in direct support of the Monument Management Plan's Marine Conservation Science (MCS) and Habitat Management and Conservation (HMC) Action Plan, Activity: MCS 1: Continue and enhance research, characterization and monitoring of marine ecosystems for the life of the plan, as appropriate, HMC 3.2: Inventory and map manmade structures and changes in natural beach and reef state that may influence erosion and depositional processes at all of the beach strand units of the Monument., and HMC 9.2: Develop and implement techniques for monitoring plant and animal populations on cliff habitats in the Monument within 10 years ((PMNM MMP Vol. 1, 2008).

In addition, activities to support understanding and interpreting the NWHI are addressed in the Monument Management Plan Environmental Assessment. This EA covers field activities "carried out to conserve, manage, monitor, and document species and their natural habitats" (PMNM MMP Vol 2, p.202).

Consulted Parties:

The permit application was sent out for review and comment to the following scientific and cultural entities: Hawai'i Division of Aquatic Resources, Hawai'i Division of Forestry and Wildlife, Papahānaumokuākea Marine National Monument (NOAA/NOS), NOAA Pacific Islands Regional Office (NOAA-PIRO), United States Fish and Wildlife Service Hawaiian and Pacific Islands National Wildlife Refuge Complex Office, the Office of Hawaiian Affairs (OHA), and the PMNM Cultural Working Group. In addition, the permit application has been posted on the Monument Web site since April 4, 2016 giving the public an opportunity to comment. The application was posted within 40 days of its receipt, in accordance with the Monument's Public Notification Policy.

Exemption Determination:

After reviewing HAR § 11-200-8, including the criteria used to determine significance under HAR § 11-200-12, DLNR has concluded that the activities under this permit would have minimal or no significant effect on the environment and that issuance of the permit is categorically exempt from the requirement to prepare an environmental assessment based on the following analysis:

1. All activities associated with this permit, including deployment of an underwater camera, have been evaluated as a single action. As a preliminary matter, multiple or phased actions, such as when a group of actions are part of a larger undertaking, or when an individual project is precedent to or represents a commitment to a larger project, must be grouped together and evaluated as a single action. HAR § 11-200-7. This permit does not involve an activity that is precedent to a later planned activity.

2. The Exemption Class for Scientific Research with no Serious or Major Environmental Disturbance Appears to Apply. Chapter 343, HRS, and § 11-200-8, HAR, provide for a list of classes of actions exempt from environmental assessment requirements. HAR §11-200-8.A.5. exempts the class of actions which involve "basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource." This research falls within Exemption Class #5, Exempt Item #2 which allows "non-destructive data collection and inventory, including field aerial and satellite surveying and mapping." Additionally, this research falls within Exemption Class #5, Exempt Item #15 which includes "aquatic life surveys, inventory studies, new transect lines, photographing, recording, sampling, collection, culture and captive propagation" which is listed on the DEPARTMENT OF LAND & NATURAL RESOURCES, EXEMPTION LIST (June 5, 2015).

As discussed below, no significant disturbance to any environmental resource is anticipated in the filming of Monument resources. Thus, so long as the below considerations are met, an exemption class should include the action now contemplated.

3. Cumulative Impacts of Actions in the Same Place and Impacts with Respect to the Potentially Particularly Sensitive Environment Will Not be Significant. Even where a categorical exemption appears to include a proposed action, the action cannot be declared exempt if "the cumulative impact of planned successive actions in the same place, over time, is significant, or when an action that is normally insignificant in its impact on the environment may be significant in a particularly sensitive environment." HAR § 11-200-8.B. To gauge whether a significant impact

or effect is probable, an exempting agency must consider every phase of a proposed action, any expected primary and secondary consequences, the long-term and short-term effects of the action, the overall and cumulative effect of the action, and the sum effects of an action on the quality of the environment. HAR § 11-200-12. Examples of actions which commonly have a significant effect on the environment are listed under HAR § 11-200-12.

One prior study of this type has been undertaken to date, which had no deleterious effects on Monument resources. Other permits that have involved underwater filming, for educational purposes, have had no deleterious effects on Monument resources. With this in mind, significant cumulative impacts are not anticipated as a result of this activity, and numerous safeguards further ensure that the potentially sensitive environment of the project area will not be significantly affected. All activities will be conducted in a manner compatible with the management direction of the Monument Proclamation in that the activities do not diminish monument resources, qualities, and ecological integrity, or have any indirect, secondary, cultural, or cumulative effects. The joint permit review process did not reveal any anticipated indirect or cumulative impacts, nor did it raise any cultural concerns, that would occur as a result of these activities.

The proposed project would be supported by the NOAA ship R/V HI'IALAKAI (permitted separately under permit PMNM-2016-006). Table 1. lists approved activities taking place aboard the HI'IALAKAI. Table 2. lists additional activities that are anticipated to take place concurrently within the Monument, both approved and pending.

**Table 1. Concurrent Projects Aboard NOAA SHIP HI'IALAKAI**

Permit	Purpose and Scope	Location
PMNM-2016-006 NOAA Ship HI'IALAKAI	The permit allows NOAA Ship HI'IALAKAI entry into PMNM. Personnel aboard the vessel will be permitted under separate permits.	All locations
PMNM-2016-001 Co-Trustees' Permit	Activities covered under the Co-Trustees' permit will also be taking place in PMNM during spring 2016 (i.e. deployment of restoration field crews, monk seal camps, etc).	All locations
PMNM-2016-023 Brainard (proposed)	The Applicant would be conducting survey assessments and selected sampling of corals, macro-invertebrates, fish, and algae in shallow water reefs for the Pacific Reef Assessment and Monitoring Program (RAMP).	Nihoa, Mokumanamana, French Frigate Shoals, Laysan Island, Lisianski Island, Pearl and Hermes Atoll, Midway Atoll, Kure Atoll

**Table 2. Concurrent Projects in PMNM**

Permit	Purpose and Scope	Location
PMNM-2016-019 Conklin (approved) SSV Makani Olu	The Applicant would be conducting nearshore reef fish assessments.	Nihoa
PMNM-2015-017-A1 Yim (approved) SSV Makani Olu	The Applicant will be using traditional ecological knowledge to examine intertidal ecosystems activities.	Nihoa, Mokumanamana

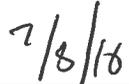
The above other permits would potentially be active in the Monument concurrently with the proposed activities. Most of those would be dealing with different organisms or habitat types and would not overlap. Of these proposed permits, none are intended to duplicate the collections and scope of the Applicant’s research. The culmination of these permits, and their disparate activities, occurring throughout the Monument, is not anticipated to have significant cumulative impacts.

There is not an overlap in research activities for the Applicants aboard the HI’IALAKAI or the particular resources they will interact with in their research. All research will contribute to the overall knowledge of PMNM. Since no significant cumulative impacts or significant impacts with respect to any particularly sensitive aspect of the project area are anticipated, the categorical exemptions identified above should remain applicable.

4. Overall Impacts will Probably be Minimal and Insignificant Any foreseeable impacts from the proposed activity will probably be minimal, and further mitigated by general and specific conditions attached to the permit. Specifically, all research activities covered by this permit will be carried out with strict safeguards for the natural, historic, and cultural resources of the Monument as required by Presidential Proclamation 8031, other applicable law and agency policies and standard operating procedures.

Conclusion. Upon consideration of the permit to be approved by the Board of Land and Natural Resources, the potential effects of the above listed project as provided by Chapter 343, HRS and Chapter 11-200 HAR, have been determined to be of probable minimal or no significant effect on the environment and exempt from the preparation of an environmental assessment.

  
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 Suzanne D. Case  
 Board of Land and Natural Resources

  
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 Date