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

Permit Category: Conservation and Management
Proposed Activity Dates: 9/01/2015 - 9/30/2015 (some subset of those days
Proposed Method of Entry (Vessel/Plane): NOAA RV Oscar Elton Sette
Proposed Locations: French Frigate Shoals, Laysan, Lisianski, Pearl and Hermes Reef, Midway, Kure

Estimated number of individuals (including Applicant) to be covered under this permit: 10
Estimated number of days in the Monument: 12

Description of proposed activities: (complete these sentences):

a.) The proposed activity would…
Utilize the AeroVironment Puma All Environment (AE) Unmanned Aircraft System (UAS) and two multi-rotor UAS platforms (Ivan and APH-22) for environmental monitoring in the Northwestern Hawaiian Islands (NWHI). Specifically, the UAS will support monitoring and surveying of marine mammals and marine debris (and potentially other flora and fauna) in some or all of the areas of French Frigate Shoals, Laysan, Lisianski, Pearl and Hermes Reef, Midway Atoll and Kure Atoll.

b.) To accomplish this activity we would ….
Utilize the UAS to meet the resource protection and management requirements of the Papahanaumokuakea Marine National Monument. We will deploy (hand launch) the UAS platforms to survey select sites within the NWHI for marine mammal activity as well as marine debris. The UAS would fly at altitudes below 500 feet.

The UAS HD video data and photographs collected would be evaluated and compared to existing datasets to determine if the resolution would be sufficient to assess marine mammal (ability to identify individuals) and seabird colony population dymanics for long-

term monitoring. They will also be used to survey for marine debris. If desired, they can also be used for vegetation surveys. In using these platforms, managers would be able to minimize potential wildlife disturbance, which is an inherent factor in conducting low level survey flights with conventional aircraft.

Specific goals for thie project include:
1) Continued assessment of integration of the PUMA into normal operations during a NWHI NOAA ship based research cruise for PMNM conservation/research objectives.
2) Assess utility of multicopter systems as a research and management tool that could be integrated into field camps.
3) Compare performance (flight, data collection etc.) between two multicopter platforms (IVAN and APH-22)
4) Assess the ability of the systems to operate discreetly without disturbance to sensitive seabird colonies or marine mammals.
5) Assess ability to collect remote imagery and develop habitat maps for a broad range of resource protection and management issues ranging from climate change to marine mammals and cultural landscapes.
6) Develop and implement protocol to assess the body condition of hauled out monk seals. This will be done in collaboration with researchers capturing and hanlding seals for other purposes (activities covered by PMNM Managers Permit).
7) Aerial surveys of Lisiaksnki, Laysan and Kure to compliment the terrestrial shipwreck survivor camp surveys we will be conducting on island in August

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.

Other information or background:
The UAS will be launched and recovered from land, the NOAA R/V Hiialakai, or one of the ships' launches and/or rigid hulled inflatables and flown at altitudes below 500 feet. NOAA qualified agency personnel (includes Cooperative Institute and contract pilots) will be operating the UAS.

The PUMA system consists of three platforms (aerial units) and two ground control units. The system is controlled via a remote control unit and is capable of a controlled landing, where the unit will slowly descend, glide above the area on which it will land and then land via deep stall in the water or on land. 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 an 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. The UAS systems are cheaper, safer and 'greener' than conducting manned operations. Over the past three years, the protocols and procedures for surveying marine mammals, sea birds and marine debris with the Puma

UAS system have been developed and perfected in national marine sanctuary sites across the country. The PUMA was successfully operated within the NWHI in 2014. The following is a brief list of relevant NOAA Puma UAS missions that have been conducted:

a. Law Enforcement Demo in Channel Islands NMS (May 2009)

b. Oil Spill Drill & Law Enforcement in Channel Islands NMS (Sep 2011)

c. Marine Debris testing and Planning Workshop in Haliewa, Hawaii 2013 (June 2012)

d. Sea Birds, Blue Whale and Night Law Enforcement in Channel Islands NMS (August 2012)

e. Law Enforcement demo with the Center for Asymmetric Warfare of the Naval Post Graduate School in Channel Islands NMS (August 2012)

f. Law Enforcement and Habitat Mapping in Florida Keys NMS (October 2012)

g. NOAA R/V Nancy Foster vessel use survey in Gray's Reef NMS (April 2013)

h. Seabird Survey in Channel Islands NMS (June 2013)

i. Seabird Survey in Olympic Coast NMS in conjunction with USFWS Copalis & Flattery Rocks National Wildlife Refuges (June 2013)

j. Onboard USCG Healy (September 2013).

k. Marine mammal survey in Channel Islands NMS (November 2013)

The two multicopter systems, like the Puma, are also relatively quiet, easy to use, low maintenance and reliable for marine research. The systems are relatively inexpensive to operate and use an electric battery. The Ivan is an octocopter system that was built specifically for the marine environment and can land in the water if necessary. Additional rotors prevent hard landings due to unlikely failure of multiple rotors. The APH-22 has been ruggedized to withstand marine environments but can not be landed in the water. Flight times will range between 15-20 minutes.

Per FAA regulations, only 1 UAS unit would be deployed at a time and the unit will remain within visual range and 1 mile of the remote operator at all times.

Section A - Applicant Information

1. Applicant

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

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

1a. Intended field Principal Investigator (See instructions for more information):
Charles Littnan and Todd Jacobs (NOAA UAS Program)

2. Mailing address (street/P.O. box, city, state, country, zip):

[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

Don Le Roi, Contractor, Principal APH-22 Pilot
TBD, Aerotestra, Principal Ivan Pilot
TBD, Aerotestra, Secondary Ivan Pilot
TBD, NOAA AOC, Puma UAS Operator
TBD, Aerovironment, Principal Puma UAS Operator
TBD, Aerovironment, Principal Puma UAS
TBD, Aerovironment, Principal Puma UAS
TBD, Partner Agency, Collaborator
TBD, Partner Agency, Collaborator

Section B: Project Information

5a. Project location(s):

		Ocean Based	
☐ Nihoa Island	☐ Land-based	☐ Shallow water	☐ Deep water
☐ Necker Island (Mokumanamana)	☐ Land-based	☐ Shallow water	☐ Deep water
☒ French Frigate Shoals	☒ Land-based	☒ Shallow water	☐ Deep water
☐ Gardner Pinnacles	☐ Land-based	☐ Shallow water	☐ Deep water
☐ Maro Reef			
☒ Laysan Island	☒ Land-based	☒ Shallow water	☒ Deep water
☒ Lisianski Island, Neva Shoal	☒ Land-based	☒ Shallow water	☒ Deep water
☒ Pearl and Hermes Atoll	☒ Land-based	☒ Shallow water	☒ Deep water
☒ Midway Atoll	☒ Land-based	☒ Shallow water	☐ Deep water
☒ Kure Atoll	☒ Land-based	☒ Shallow water	☐ Deep water
☐ Other			

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

Location Description:

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

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 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 endangered Layan 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 initiated in 2014 to assess the efficacy of UAS to aid in marine debris surveys, marine mammal and bird monitoring efforts, and habitat characterization in the Monument. The UAS have the ability to collect remote imagery and develop habitat maps for a broad range of resource protection and management issues. In addition, these systems are able to operate discreetly without disturbance to sensitive seabird colonies or marine mammals.

*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, the UAS research team (including members from NOAA and USFWS) demonstrated that the PUMA system could operate with virtually no impacts to cultural and natural resources within the Monument. As in 2014, the development of the UAS

missions will be done in close collaboration with Monument partners and the systems will be operated by trained NOAA staff and affiliates. 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.

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. All images selected for potential public use as part of communications, education and outreach efforts would be reviewed by the Monument Communications Team, which includes an OHA representative, and the PMNM/ONMS Native Hawaiian Coordinator. Since cultural site imagery is not the purpose of the mission, there are no plans to use imagery other than marine life and marine debris survey images. A similar process was used in 2014 and seemed to work well.

In 2014, after consultation with the State of Hawai'i SHPO a no-effect determination was reached in regards to a section 106. However, it was acknowledged that the UAS will impact the cultural and spiritual essence of the place during operation and there was consultation with the MMB and agency staff to ensure that UAS operations do not conflict with or operate during the same time that cultural and protocol activities occur. A similar protocol and coordination will be followed this year. Additionally, we are open to continuing discussions on how our operations can be conducted in a culturally respectful and sensitive manner and would not be adverse to permit conditions that mitigate concerns, should our permit application be endorsed and prior to issuance.

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, generally flying at altitudes below 500 feet. Previous operations in the NWHI and elsewhere have demonstrated no disturbance to marine mammals and little to no disturbance to seabird colonies during flights. The data captured would be managed by NOAA and shared with other managing agencies and aid in management decision-making.

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.
Similar platforms have been tested in a variety of sensitive wildlife areas. The work here is to determine the operation constraints and value to the agencies and researchers working within the Monument so there is no practicable alternative to conducting this activity.

d. How does the end value of the activity outweigh its adverse impacts on Monument cultural, natural and historic resources, qualities, and ecological integrity?
The information gathered by the UAS will not only establish a baseline of data collected by this means, it will also compliment all other data collected by field surveys. Due to federal budget shortfalls, the capacity of the UAS will aid in managers' ability to continue to monitor areas within PMNM.

e. Explain how the duration of the activity is no longer than necessary to achieve its stated purpose.
The activity will be conducted on the Sette during the Monk Seal Camp recovery (separately permitted activity) from roughly 9/01/15-9/30/15.

f. Provide information demonstrating that you are qualified to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.
CV of Primary Applicant is attached and other CVs and qualifications can be provided as the team is identified. Background on the two primary field researchers (Littnan and Jacobs) is here:

Todd Jacobs, National Oceanic and Atmospheric Administration, is currently the Deputy Superintendent for Operations and Administration for the Channel Island National Marine Sanctuary and a Project Scientist with the NOAA UAS Program. He has been with the NOAA National Ocean Service since 1989. His background includes facilitating research projects using research vessels, manned submersibles, aircraft and unmanned aircraft systems. He has been the principal investigator on more than 20 UAS missions and has been involved with the NOAA UAS Program since its inception in 2004.

The primary field investigator is a Project Scientist for NOAA's OAR, UAS Program. The applicant and his affiliates possess high levels of expertise and knowledge of the UAS as well as the ecosystem and locations within the Monument. These experts provide their knowledge and recommendations in all management decisions so that all impacts are minimized and mitigated if necessary.

Charles Littnan is the head of NOAA's Hawaiian Monk Seal Research Program, the primary group charged with understanding and recovering this endangered species. The HMSRP is considering 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 and will be certified for operation by NOAA.

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. NOAA responsible for payment of damages on wildlife should any occur during operations.

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 2014. 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's 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?

NOAA Ship Sette is equipped with a Monument type-approved NOAA OLE Vessel Monitoring System (Specifications below).

Sailor TT 3606 XP - Thrane & Thrane VMS Email: 436902144@c.xantic.net Inmarsat ID#:436902144

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:

Deployment, operation and retrieval of PUMA AE UAS in areas around French Frigate Shoals, Laysan, Lisianski, Pearl and Hermes Reef, Midway Atoll and Kure.

The UAS will be launched and recovered from land, the NOAA Ship R/V Sette, or one of the ships' launches and/or rigid hulled inflatables and flown at altitudes below 500 feet. During descent, the UAS operator will ensure that no marine mammals, cetaceans, seabirds or other known species are in the retrieval area. UAS operators may need to swim to retrieve the UAS system if landed in the water though this is unlikely. It is possible to lower the UAS system onto a vessel as well.

The PUMA system consists of three platforms (aerial units) and two ground control units. Per FAA regulations, only 1 UAS unit would be deployed at a time and the unit will remain within visual range and 1 mile of the remote operator at all times. The system is controlled via a remote control unit and is capable of a controlled landing, where the unit will slowly descend, hover above the area on which it will land and then land. The system's low noise, ease of use, simplicity and low maintenance are all

beneficial to marine research. The system is relatively inexpensive to operate and uses an electric battery. Systems are durable, rugged for deployment to remote marine areas and repeat usage. They were developed for the US Special Operations Command (SOCOM). These systems can fly for up to 2 hours and cover a range of about 50 square miles. The UAS systems are cheaper, safer and 'greener' than conducting manned operations.

The two multicopter systems are launched either from resting on the ground/floor or from an operator's hand. The system will fly for approximately 15-20 minutes and will remain within the pilot's visual range. The rechargeable battery will be replaced for each mission.

General Operation Guidelines:
Daylight hours only
Winds less than 25kts
There will be at least one pilot and observer for each mission and an additional observer to watch and record widlife response.
Only a single platform will be flown at a time.

The exact mission protocols and objectives will be developed in consultation with partner agencies based on their management /research needs and interests in July 2015.

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:
PUMA AE UAS
Omni RF Head Unit
Gimbaled EO/IR/Illuminator
Battery Charger
Toughbook
AV Batteries
Field Repair Kits

Marine IVAN- UAV
RC Controller (Turnigy 9XR 2.4GHz)
Ground Control Station (Laptop, tripod stand, telemetry radio (915 Mhz))
4S Lithium polymer battery- 4000 Mah (Quantity: 6)
Canon A2500 Camera
VHF Aviation Radio
Lipo Charger, power inverter

DSLR Camera
External Hard Drives
Gyro Table

APH-22 Hexacopter
RC Controller (Futaba T10CAG/CHG 2.4Ghz)
Ground Control Station (Laptop, tripod stand, telemetry radio (915 Mhz))
4S Lithium polymer battery- 4000 Mah (Quantity: 4-6)
VHF Aviation Radio
DSLR Camera
Gyro Table

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:
Wildlife impacts will be assessed and analyzed on site and protocols modified accordingly. A white paper comparing operation and performance across platforms will be produced within 6 months of the end of flight operations. Potential submission for publication in technical journal within 12 months. There will also be a series of post-operation briefings to partner agencies as requested.

16. List all Applicant's publications directly related to the proposed project:
N/A

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.

2/1/2015

Signature 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