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

August 9, 2019

Board of Land and Natural Resources
Honolulu, Hawai'i

Request for Authorization and Approval to Issue a Papahānaumokuākea Marine National Monument Research Permit to Jennifer Samson, National Oceanic and Atmospheric Administration, Pacific Island Fisheries Center, for Access to State Waters to Conduct Activities for the Pacific Reef Assessment and Monitoring Program

The Division of Aquatic Resources (DAR) hereby submits a request for your authorization and approval for issuance of a Papahānaumokuākea Marine National Monument research permit to Jennifer Samson, Chief of the Coral Reef Ecosystem Program, of the National Oceanic and Atmospheric Administration (NOAA), Pacific Island Fisheries Science Center, 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 research 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:

- French Frigate Shoals
- Lisianski Island
- Pearl and Hermes Atoll
- Kure Atoll

The activities covered under this permit would occur between August 10, 2019 and August 09, 2020.

The Applicant and the proposed reef assessment and monitoring activities are largely a renewal of work previously permitted and conducted in the Monument.

INTENDED ACTIVITIES

The application for these proposed activities was originally submitted by Dr. Rusty Brainard/NOAA, reviewed and endorsed by the MMB agencies. It was then subsequently approved by the BLNR on May 24, 2019 (ATTACHED). Dr. Brainard has resigned from NOAA and per Mr. Justin Rivera's email dated 7/22/19, Jennifer Samson of NOAA is re-requesting the same proposed activities.

Jennifer Samson (applicant) proposes to conduct reef assessment and monitoring activities

within the Monument, as part of the Pacific Reef Assessment and Monitoring Program (RAMP) from 8/20/2019 - 9/7/2019 on a research cruise aboard NOAA Ship RAINIER (separate permit application underway). A total of 23 trained researchers would conduct activities from 0 - 30 m. depth at randomly selected sites at French Frigate Shoals, Lisianski Island, Pearl and Hermes Atoll, and Kure Atoll.

The primary research areas include 1) ocean and climate change; 2) benthic communities; 3) non-coral invertebrates; and 4) reef-associated fish communities. Specific proposed research activities within these four areas are listed below:

Ocean and Climate Change Monitoring

- Perform conductivity, temperature, and depth recorder (CTD) casts to gather depth profiles of temperature and salinity in shallow-water environments.
- Conduct water sampling efforts in conjunction with CTD casts at coral reef survey sites to quantify the carbonate system present
- Recover and replace instrumentation to assess and monitor changes in calcification and bioerosion rates measured within the reef community. This information will help assess the response of coral reef ecosystems to climate change and ocean acidification.
- Complete maintenance, replacement and installation of various oceanographic instrument arrays that have been long-term scientific features at permanent survey sites.
- Use photomosaics (Structure-for-Motion, 'SfM') to collect coral community composition data at the climate stations and contextualize any physical and/or biological changes recorded at the climate stations over time.
- Habitat characterization of the permanent sites.

Reef Fish Monitoring

- Gather data sufficient to assess status and trends of Pacific reef fish populations.
- Provide the basis for meaningful comparison of reef fish stocks across the PNMN.
- Provide the basis needed to assess the response (or potential response) of reef fish communities to possible ecosystem impacts such as fishing, ecotourism, pollution, habitat damage, sedimentation, and hurricanes.
- Conduct SfM surveys at each site to assess habitat complexity, coral demography and benthic cover.

The proposed activities directly benefit the Monument through 3.1.1 – Marine Conservation Science Action Plan (Strategy MCS-1: Continuing to enhance research, characterization and monitoring of marine ecosystems for the life of the plan, as appropriate, and Strategy MCS-2: Assess and prioritize research and monitoring activities over the life of the plan). These research activities are part of a long-term monitoring strategy to document and assess changes in the Monument's reef habitats and ocean chemistry over time.

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

☒ 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
☒ Discharging or depositing any material or matter into the Monument
☒ Touching coral, living or dead
☒ Swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area

REVIEW PROCESS

The ***original Brainard*** 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 March 20, 2019 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. OHA appreciates the research being done in Papahānaumokuākea to assess conditions of the resources there. To share this important work and to update our beneficiaries, are there links, documents, or published articles of past research findings to share with interested community members?

Response: A general overview of RAMP activities in Papahānaumokuākea can be found here:

- https://www.pifsc.noaa.gov/cred/pacific_ramp.php

A number of data/cruise reports from prior research in Papahānaumokuākea are readily available for public review. For example:

- Pacific Reef Assessment and Monitoring Program Data Report Ecological monitoring 2017-reef fishes and benthic habitats of the Northwestern Hawaiian Islands, Pacific Remote Islands Marine National Monument, and the Mariana Archipelago

  Link:https://repository.library.noaa.gov/view/noaa/17546/noaa_17546_DS1.pdf?

Detailed team-specific methodological information, along with public access to raw and metadata archives, can be obtained through NOAA CoRIS. For example:

- Pacific Islands Fisheries Science Center, 2019: Pacific Reef Assessment and Monitoring Program: Water Chemistry of the Coral Reefs across the U.S.-affiliated Pacific Islands from Water Samples collected from 2012 to 2014.

  Link: https://inport.nmfs.noaa.gov/inport/item/25253.

  The 2013 and 2014 data overlap with the following NCRMP accessions:

- Hawaiian Archipelago 2013: Accession 0157714.
  Link: https://inport.nmfs.noaa.gov/inport/item/36067

An additional example for reef fishes is noted below:

- Pacific Islands Fisheries Science Center, 2019: Pacific Reef Assessment and Monitoring Program: Stratified Random Surveys (StRS) of Reef Fish, including Benthic Estimate Data at Coral Reef Sites across the Pacific Ocean from 2007 to 2012,
  Link: https://inport.nmfs.noaa.gov/inport/item/34515.

Finally, data from prior research in Papahānaumokuākea has been published, in comparison with the Main Hawaiian Islands and/or US-Pacific Territories, in a number of open-access manuscripts. For example:

- Nadon MO, Ault JS, Williams ID, Smith SG, DiNardo GT (2015) Length-Based Assessment of Coral Reef Fish Populations in the Main and Northwestern Hawaiian Islands. PLoS ONE 10(8): e0133960. https://doi.org/10.1371/journal.pone.0133960

2. How will the loss of Hi'ialakai impact the proposed activities? Are any likely to be canceled?

Response: The first mission to the Papahānaumokuākea by the *Hi'ialakai* occurred in 2004, and our program was lucky to have successfully sailed with her over the course of the past 14 years.

The loss of the *Hi'ialakai* will, in the immediate term, be mitigated with the activation/ availability of the NOAA research vessel *Rainier*, which is slated to arrive in Hawaii ~ 06/30/19.

Our current mission profile calls for HARAMP field activities to fall between 08/20/19 – 09/07/19 (19 Days at Sea), whereby a.) NMFS/CRCP will have 2 launches (Hi'ialakai-transferred jetboats) available for HARAMP operations, b.) NOS will have 2 launches (*Rainier* assets) involved with mapping activities (covered independently under a *Rainier* PMNM permit application).

That mission would be led by Chief Scientist Hannah Barkley.

For RAMP-related research activities in Papahānaumokuākea, those would primarily focus on previously described OCC (oceanographic climate change) elements in our original Papahānaumokuākea permit application. These include: instrumentation swap-outs, water

sampling/carbonate chemistry, CTD casts, and Structure-for-Motion photogrammetry. Currently, we do not expect underwater visual assessments of benthic habitats/fish populations.

3. Question 14 (p. 16) asks, "Provide a timeline for sample analysis, data analysis, write-up, and publication of information." Where will the write up be published, and how will your findings and conclusion be communicated to managers?

Instrument data (STR, CTD, and diel suite) will be downloaded and fully processed by the end of the cruise. CAUs will be analyzed at PIFSC. Water samples will be sent to the NOAA Pacific Marine Environmental Laboratory (PMEL) for analysis, and BMUs will be sent to the NOAA Atlantic Oceanographic and Meteorological Laboratory (AOML). The anticipated time frame for the completion of CAU, BMU, and water sample analyses is 6 to 8 months following cruise termination. Submission of all data sets to NCEI (STR, CTD, diel suite, water samples, CAUs, BMUs) will be completed within one year. A summary brief, describing field activities conducted during the cruise and initial results, will be produced within 3 months of the mission end date and distributed to partners and managers.

COMMENTS:

1. Please follow quarantine and sterilization procedures implicitly to prevent the spread of diseases and invasive species from one site to another.

   Understood

2. If any anchoring occurs with small boats use BMPs for anchoring: Only anchor in sand patches, swimming anchor down (if possible) and guide it so that reef is not adversely affected. Make sure anchor chain or line is not rubbing on the reef or breaking coral.

   Understood

3. No objections to the proposed activities as described. The PI has demonstrated that the team is capable of conducting all of the activities without adverse impacts to the Monument and its resources.

   Noted and thank you

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 consultation pursuant to section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. §1531 *et seq.*) is underway to analyze the effects of proposed activities within the Monument on listed species and designated critical habitat. 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 of all aforementioned activities following section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA; 16 U.S.C. 1855(b)) is underway to analyze the effects of proposed activities within the Monument on essential fish habitat. 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.
- The Department has made an exemption determination for this permit in accordance with 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 PAPAHĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT RESEARCH PERMIT TO JENNIFER SAMSON, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, PACIFIC ISLANDS FISHERIES SCIENCE CENTER, FOR ACCESS TO STATE WATERS TO CONDUCT ACTIVITIES FOR THE PACIFIC REEF ASSESSMENT AND MONITORING PROGRAM UNDER PERMIT PMNM-2019-013").

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-2008-062, PMNM-2010-052, PMNM-2013-024 to conduct similar work in 2008, 2010, and 2013 respectively. In addition, the Applicant has previously held permits for similar activities in the Monument under permits NWHINM-2006-011 and NWHINM-2006-015.

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 the following 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 Jennifer Samson, Chief of the Coral Reef Ecosystem Program, of the National Oceanic and Atmospheric Administration (NOAA), Pacific Island Fisheries Center, with the following special conditions:

a. 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.

b. 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.

c. 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.

d. 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.

e. 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.

f. Tenders and small vessels must be equipped with engines that meet EPA emissions requirements.

g. 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.

h. If there is any Hawaiian monk seal or any other protected species in the area when performing any permitted activity shall cease until the animal(s) depart the area, except as permitted for specific management of that species.

i. No fishing is allowed in State Waters except as authorized under State law for subsistence, traditional and customary practices by Native Hawaiians.

Respectfully submitted,

Maria Carnevale
Papahānaumokuākea Marine National Monument

APPROVED FOR SUBMITTAL

SUZANNE CASE
Chairperson

Carnevale, Maria A

From: Justin Rivera - NOAA Affiliate <justin.rivera@noaa.gov>
Sent: Monday, July 22, 2019 10:59 AM
To: Carnevale, Maria A
Cc: Amanda Boyd; Daniel Link; Hoku Kaaekuahiwi; Justin Rivera; kaaleleow; Richard Hall
Subject: Fwd: permit update and pre-access briefing
Attachments: Permit Application_PMNM-2019-013.pdf; CIS_Form_Samson July 2019.docx

Aloha Maria,

Per the e-mail thread below, the named permittee on permit no. PMNM-2019-013 will need to be changed from Rusty Brainard to Jennifer Samson.

Attached is an updated CIS form and original permit application. All proposed activities are listed below and have not changed from what was originally approved by the BLNR on 5/24/2019:

Conduct reef assessment and monitoring activities within the Monument, as part of the Pacific Reef Assessment and Monitoring Program (RAMP) from 8/20/2019 - 9/7/2019 on a research cruise aboard NOAA Ship RAINIER (separately permitted under permit no. PMNM-2019-017). Up to 23 trained researchers would conduct activities from 0 - 30 m. depth at randomly selected sites at French Frigate Shoals, Lisianski Island, Pearl and Hermes Atoll, and Kure Atoll.

The primary research areas include 1) ocean and climate change; 2) benthic communities; 3) non-coral invertebrates; and 4) reef-associated fish communities. Specific proposed research activities within these four areas are listed below:
Ocean and Climate Change Monitoring
- Perform conductivity, temperature, and depth recorder (CTD) casts to gather depth profiles of temperature and salinity in shallow-water environments.
- Conduct water sampling efforts in conjunction with CTD casts at coral reef survey sites to quantify the carbonate system present
- Recover and replace instrumentation to assess and monitor changes in calcification and bioerosion rates measured within the reef community. This information will help assess the response of coral reef ecosystems to climate change and ocean acidification.
- Complete maintenance, replacement and installation of various oceanographic instrument arrays that have been long-term scientific features at permanent survey sites.
- Use photomosaics (Structure-for-Motion, 'SfM') to collect coral community composition data at the climate stations and contextualize any physical and/or biological changes recorded at the climate stations over time.
- Habitat characterization of the permanent sites.

Reef Fish Monitoring
- Gather data sufficient to assess status and trends of Pacific reef fish populations.
- Provide the basis for meaningful comparison of reef fish stocks across the PNMN.
- Provide the basis needed to assess the response (or potential response) of reef fish communities to possible ecosystem impacts such as fishing, ecotourism, pollution, habitat damage, sedimentation, and hurricanes.
- Conduct SfM surveys at each site to assess habitat complexity, coral demography and benthic cover.

Looping in the rest of the team here as well.

Let me know if there is anything else you need.

Mahalo,
Justin

---------- Forwarded message ---------
From: **Hannah Barkley - NOAA Affiliate** <hannah.barkley@noaa.gov>
Date: Mon, Jul 22, 2019 at 10:49 AM
Subject: Re: permit update and pre-access briefing
To: Justin Rivera - NOAA Affiliate <justin.rivera@noaa.gov>
Cc: Jacob Asher - NOAA Affiliate <jacob.asher@noaa.gov>

Thanks Justin. I'm able to attend the 8/9 meeting.

On Mon, Jul 22, 2019 at 10:22 AM Justin Rivera - NOAA Affiliate <justin.rivera@noaa.gov> wrote:
Hi Jake,

Yes, one of you will need to attend the 8/9 land board meeting.

Will send a reminder and agenda the week of the meeting.

mahalo for your patience.

Justin

On Thu, Jul 18, 2019 at 3:46 PM Jacob Asher - NOAA Affiliate <jacob.asher@noaa.gov> wrote:
That's correct. Rusty has retired from NOAA. Jennifer Samson is now leading all RAMP-related efforts.

Do we (or one of us) need to attend the 8/9 Land Board meeting? Seems excessive, considering we just attended one prior to the start of RAMP, but we'll do what we need to.

Please advise.

Thanks for your work on this!

Jake

On Wed, Jul 17, 2019 at 11:26 AM Justin Rivera - NOAA Affiliate <justin.rivera@noaa.gov> wrote:
Hi Jake,

Just want to confirm: Jennifer Samson will now be the permittee for what was originally Rusty's permit (# PMNM-2019-013), correct?

If so, I've been informed by our State partners that this change would require land board approval at the 8/9 land board hearing.

I would still move forward drafting the permit with Jennifer's name as permittee, but would send out for Co-Trustee signature after the land board approves the change with the expectation that the permit would still be issued prior to the cruise departure on 8/20.

Let me know if you have any questions,

Justin

On Fri, Jul 12, 2019 at 3:11 PM Jacob Asher - NOAA Affiliate <jacob.asher@noaa.gov> wrote:
No worries, thanks for the update.

One change: the Federal/Program Lead for RAMP missions is no longer Rusty, as he recently retired from NOAA. He's been replaced by Jennifer Samson.

Let us know if you have any questions, or need additional inputs.

Cheers.

Jake

--
Hannah C Barkley, PhD
Coral Reef Ecosystem Oceanographer
NOAA | NMFS | PIFSC | ESD
1845 Wasp Blvd., Building 176
Honolulu, HI 96818
Office: (808) 725-5484
Cell: (908) 256-6442

--
Justin Rivera, Policy and Permit Specialist (NOAA-Affiliate, Lynker Technologies LLC)
Papahānaumokuākea Marine National Monument

NOAA/ Inouye Regional Center
NOS/ONMS/PMNM/Att.: Justin Rivera
1845 Wasp Blvd, Building 176
Honolulu, HI 96818

Phone: 808-725-5831
Fax: 808-455-3093
email: justin.rivera@noaa.gov

--
Visit on the Web: www.papahanaumokuakea.gov and www.lynkertech.com
Follow us on Facebook: www.facebook.com/Papahanaumokuakea

Papahānaumokuākea Marine National Monument

RESEARCH 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:
NOAA/Inouye Regional Center
NOS/ONMS/PMNM/Attn: Permit Coordinator
1845 Wasp Blvd, Building 176
Honolulu, HI 96818
nwhipermit@noaa.gov
PHONE: (808) 725-5800 FAX: (808) 455-3093

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: Jennifer Samson
Affiliation: National Oceanic and Atmospheric Administration (NOAA), Pacific Islands Fisheries Science Center (PIFSC), Ecosystem Sciences Division (ESD)

Permit Category: Research
Proposed Activity Dates: 14 May 2019 to 30 September 2019. 20 day research mission within that time frame. Subject to vessel (Oscar Elton Sette) availability.
Proposed Method of Entry (Vessel/Plane): Vessel/Oscar Elton Sette
Proposed Locations: Shallow water reefs (<30m) of the Papahānaumokuākea Marine National Monument (Monument) including the reefs associated with: Kure Atoll, Pearl & Hermes Atoll, French Frigate Shoals, and Lisianski Island.

Estimated number of individuals (including Applicant) to be covered under this permit: 20 - 23

Estimated number of days in the Monument: 20

Description of proposed activities: (complete these sentences):

a.) The proposed activity would…

conduct reef assessment and monitoring activities throughout the islands and atolls of the Monument. These efforts would contribute to continuing research providing scientific information needed to support ecosystem approaches to the management of coral reef systems of the Monument and areas across the Pacific region. The primary focus of the multi-institutional team of scientists, led by NOAA Pacific Islands Fisheries Science Center's Ecosystem Sciences Division (ESD- formally Coral Reef Ecoystem Program), would focus on implementing the Pacific Reef Assessment and Monitoring Program (RAMP).

b.) To accomplish this activity we would ….

use monitoring efforts including rapid ecological assessments of fish to species or genus level using stationary point count (SPC) methods; generalized assessments of benthic biological cover (i.e. complexity, hard-coral cover) to occur concurrently with fish SPC surveys; Structure-from-

Motion (SfM) surveys to eventually extract coral demographic data from; and multi-platform oceanographic and water quality monitoring using shipboard surveys, and moored instrument arrays.

c.) This activity would help the Monument by …
the use of consistent interdisciplinary methods across this vast region allowing for an opportunity to perform biogeographic and ecological comparative analyses of diverse ecological, environmental, and oceanographic gradients. Patterns of variability of fish biomass, diversity, and other reef metrics are paramount to assessing an ecological system as valuable as those in the Monument.

Other information or background:
ESD conducts integrated, multidisciplinary, ecosystem research, habitat mapping, and long-term monitoring of coral reef ecosystems throughout American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, the Hawaiian Archipelago and the Pacific Remote Island Areas. This work is part of the NOAA Coral Reef Conservation Program's (CRCP) broad-scale Pacific RAMP surveys. In the past, ESD's efforts under RAMP have involved extensive benthic habitat mapping, ecological and environmental assessment and monitoring, and applied research to support improved ecosystem-based management and conservation. The RAMP efforts have historically focused on several priority research themes: 1) ocean and climate change; 2) benthic communities (with emphasis on hard corals); and 3) non-coral invertebrates; and 4) reef-associated fish communities. Monitoring of ocean and climate change focuses on thermal structure and water chemistry and is achieved by means of sustained, remotely sensed and in situ observations of ocean temperature, autonomous discrete water sampling for analyses of carbonate chemistry, and distinct biological installations designed to provide integrated, ecosystem-wide response data (e.g., biodiversity, calcification, and bioerosion) in the context of climate change. Biological monitoring for benthic and fish communities is conducted at Rapid Ecological Assessment (REA) sites using a two-stage stratified random sampling design throughout shallow-water (0–30 m), hard-bottom coral reef habitats. The knowledge gained from these methods is shared with resource managers and various public stakeholders to improve decision-making for long-term conservation and management of coral reef resources.

Section A - Applicant Information

1. Applicant

Name (last, first, middle initial): Jennifer Samson

Title: Coral Reef Ecosystem Program, Ecosystem Sciences Division, NOAA Pacific Islands Fisheries Science Center

1a. Intended field Principal Investigator (See instructions for more information):
Hannah Barkley, Ph.D. Alternate: Jacob Asher, Ph.D.

2. Mailing address (street/P.O. box, city, state, country, zip):
1845 Wasp Blvd., Building 176
Honolulu, HI 96818

Phone: (808) 725-5469

Fax: (808) 725-5429

Email: Jennifer.Samson@noaa.gov

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

3. Affiliation (institution/agency/organization directly related to the proposed project):
NOAA Pacific Islands Fisheries Science Center, Ecosystem Sciences Division (ESD)

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):
Staffing for has not been finalized yet, but the following list reflects our current plan. We will provide an updated list when our roster is confirmed.

OCEAN AND CLIMATE CHANGE
1.) Hannah Barkley
2.) Noah Pomeroy
3.) Ari Halperin
4.) Joao Garriques
5.) Morgan Winston
6.) Laura Rock

7.) Kevin O'Brien
8.) James Morioka

REEF FISH MONITORING
9.) Kaylyn McCoy
10.) Tate Wester
11.) Keo Lopes
12.) Stephen Matadobra
13.) Ivor Williams
14.) Andrew Gray
15.) TBD (DAR? QUEST?)
16.) Jacob Asher

PHOTOMOSAICS (STRUCTURE FOR MOTION)

17.) Scripps Institute of Oceanography (TBD)
18.) James Barlow
19.) Mollie Asbury

Divemaster/Chamber Operator
20.) Stephen Matadobra or NDC designate

Data Management
21.) Michael Akridge
22.) Brooke Olenski

CTD/Night Ops
23.) TBD

SST Berth
24.) TBD

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			

☐ Remaining ashore on any island or atoll (with the exception of Midway & Kure Atolls and Field Camp staff on other islands/atolls) between sunset and sunrise.

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

Location Description:
ESD's multidisciplinary monitoring teams collect data in shallow water environments from surface levels to 30 m depths. These teams plan to survey approximately 75 - 120 sites throughout the Monument to investigate the various coral reef environments in forereef, backreef and lagoon habitats. Sites will be identified prior to the cruise, and a list of positions will be submitted in the compliance form.

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 Coral Reef Conservation Act of 2000 created a national program and authorized NOAA to conduct mapping, monitoring, assessment, restoration, and scientific research that benefit the understanding, sustainable use, and long-term conservation of coral reefs and coral reef ecosystems. As part of the mandate, ESD leads coral reef ecosystem monitoring efforts in several U.S.-affiliated jurisdictions in the Pacific, including in the Monument. ESD proposes to continue its previous Pacific RAMP efforts in the Northwestern Hawaiian Islands (NWHI) by conducting coral reef ecosystem monitoring, which includes biological and oceanographic observations. In order to properly study the coral reefs and related waters of the Monument, ESD utilizes several disciplines to monitor the various biota and environments. The research areas that will be the primary focus for 2019 PMNM research activities are listed below: 1) ocean and climate change; and 2) reef-associated fish communities.

1. Ocean and Climate Change Monitoring
Long-term time series of physical oceanographic data, supplemented by discrete biological and geochemical sampling, enables characterization of the oceanographic regime within which coral reef ecosystems reside and provide important context to spatial and temporal ecological observations. Specifically, seawater carbonate chemistry (calculated from the dissolved inorganic carbon and total alkalinity concentrations in seawater) of coral reefs helps scientists understand the potential effects of ocean acidification, and temperature sensors on the seafloor record thermal structure of the water column surrounding the reefs and provide insight into thermal stress on coral reef environments and its potential role in coral bleaching events. Additional oceanographic sensors measuring waves, currents, dissolved oxygen, light levels, pH, and turbidity, provide important ancillary data for understanding oceanographic conditions influencing the coral reef ecosystems that the ESD monitors.

Objectives:
- Perform conductivity, temperature, and depth recorder (CTD) casts to gather depth profiles of temperature and salinity in shallow-water environments.
- Conduct water sampling efforts in conjunction with CTD casts at coral reef survey sites to quantify the carbonate system present at the reef ecosystems ESD visits.
- Recover and replace instrumentation to assess and monitor changes in calcification and bioerosion rates measured within the reef community. This information will help assess the response of coral reef ecosystems to climate change and ocean acidification.
- Complete maintenance, replacement and installation of various oceanographic instrument arrays that have been long-term scientific features at permanent survey sites.
- Use photomosaics (Structure-for-Motion, 'SfM') to collect coral community composition data at the climate stations and contextualize any physical and/or biological changes recorded at the climate stations over time.
- Habitat characterization of the permanent sites.

2. Reef Fishes:
Quantitative assessment and monitoring of shallow reef fish assemblages is an integral part of the ESD'S mission to improve our scientific understanding of these fish resources, and to

contribute to the scientific basis necessary for sound management. Currently, triennial monitoring surveys are conducted at each geographic sub-region (e.g. American Samoa, Hawaiian Archipelago) to document status and trends in reef fish assemblages. Habitat types surveyed encompass a wide range of habitats within ESD's survey domain (i.e. 0–30 m hard-bottom). Survey sites are determined via a stratified-random sampling scheme; the majority of sites are located on outer reef slopes. Inventories and assessments of shallow reef fishes have been completed by ESD at 40 U.S.-affiliated Pacific islands, and monitoring is ongoing. Continued updating of data, and analysis of this growing database will enable species-specific numerical and biomass densities to be calculated, fish assemblage structure to be described at various spatial and temporal scales, and statistical correlations to be determined. Further analysis of ESD's oceanographic and biological data will aid in understanding patterns of fish distribution and abundance as well as ecosystem associations.

Objectives:

- Gather data sufficient to assess status and trends of Pacific reef fish populations.
- Provide the basis for meaningful comparison of reef fish stocks across the PNMN.
- Provide the basis needed to assess the response (or potential response) of reef fish communities to possible ecosystem impacts such as fishing, ecotourism, pollution, habitat damage, sedimentation, and hurricanes.
- Conduct SfM surveys at each site to assess habitat complexity, coral demography and benthic cover.

Intended Use of Results:
Pacific RAMP research cruises are conducted in collaboration with colleagues and partners from other NOAA offices; Federal, State, and Territorial agencies; academia, industry, and nongovernmental organizations. These partnerships are essential to the effectiveness of long-term ecosystem monitoring in the region since they bring together scientists and managers with expertise and experience with a broad range of scientific and management issues. The data collected on this cruise are pivotal to long-term biological and oceanographic monitoring of coral reef ecosystems in the U.S. Pacific and the Monument. This 2019 expedition will add to information collected during baseline, monitoring and mapping surveys conducted in the NWHI between 2002 and 2016. In particular, data on the abundance and spatial distribution of reef fishes will allow scientists to evaluate potential changes in the condition and integrity of coral reef ecosystems in the region and enable managers to more effectively manage and conserve reef-associated biota.

*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?

There will be little to no adverse impacts on the Monument cultural, natural and historic resources, qualities and ecological integrity from the proposed activities. All intended activities contribute significantly to an understanding of the ecosystems within the Monument. ESD conducts RAMP cruises with the intent to provide scientific data needed to support management of the Monument through cruise reports and coral reef ecosystem monitoring reports. ESD team members conduct monitoring reef surveys with little to no adverse impacts to the natural resources of the Monument. The scientific objectives are to observe the natural habitat with minimal disturbance and to only come in contact with resources in limited occurrences to further comprehensive understanding and research in the Monument. In addition, team members attend a Hawaiian Cultural Briefing each year before entering the Monument waters. This education instills an awareness of the natural, cultural and historical values the Monument holds. Also, the NOAA research ship Oscar Elton Sette has informative cultural literature provided by the Office of Hawaiian Affairs and the Monument for personnel seeking further knowledge or who may not be able to attend the briefings.

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?

All management regulations pertaining to the Monument are strictly adhered to when conducting operations within the Monument (such as disease mitigation regulations) and in Special Preservation Areas. The PIFSC and ESD supply trained, knowledgeable and experienced researchers who are aware of and educated about the Monument's cultural, natural and historic resources, qualities and ecological integrity through cultural educators, partnerships with the co-trustees, and will act accordingly to enhance the management of the Monument. To the knowledge of PIFSC and ESD, there will be no indirect, secondary, or cumulative effects on the Monument's cultural, natural and historic resources, qualities and ecological integrity from the proposed activities. All activities proposed provide critical data that will greatly enhance the ability of Monument managers to characterize and understand the ecosystems within the Monument. As stated, all scientific methods that will be used on this cruise are designed to have minimal, if any, negative effects on the environment or cultural resources. The fundamental

goals of conservation and management are of utmost importance to the intended research, and no work outside of permitted activities shall be considered.

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.

There is no practicable alternative to conducting the research within the Monument because monitoring data gathered from this research pertains to the area being managed and is to be utilized by the Monument.

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 will be little to no adverse impacts on the Monument cultural, natural and historic resources, qualities and ecological integrity from the proposed activities. All intended activities contribute significantly to an understanding of the ecosystems within the Monument. ESD conducts RAMP cruises with the intent to provide scientific data needed to support management of the Monument through cruise reports and coral reef ecosystem monitoring reports.

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

The upcoming RAMP cruise will use the minimum amount of time needed within Monument waters to complete the required work. Due to the considerable size of the Monument and the transit time between locations, the planned schedule will maximizes the amount of operational days available.

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

RAMP cruises have been successfully conducted on an annual basis in the NWHI since 2000 in conjunction with the co-trustees of the Monument. Team members are experienced divers and highly trained personnel who will be under the guidance of the Chief Scientist Personnel from ESD have been collecting monitoring data with little to no adverse impacts to the natural resources of the islands.

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.

RAMP operations are funded by yearly grants from the NOAA ESD to the ESD, which is a part of the PIFSC. PIFSC contributes in-kind to the foundation and activities conducted by the ESD. Collaborators and partners also supply personnel and effort through their own funding.

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.

Standardized survey procedures are employed during operations. A dive plan is being formulated and all NOAA diving procedures will be followed. For each discipline there are procedure manuals, including safety instructions, for both ship and diving operation that are followed and enforced. RAMP cruises are conducted with the intention of monitoring and assessing the coral reef ecosystem with negligible impact to Monument resources. It is important to note that the methods used have shown to have little impact on the habitat being observed through various cruises and reports.

i. Has your vessel been outfitted with a mobile transceiver unit approved by OLE and complies with the requirements of Presidential Proclamation 8031?

Under a separate permit, the Oscar Elton Sette is outfitted with a mobile transceiver unit.

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

We are not aware of any other factors that would make the issuance of a permit for the activity inappropriate. CREP plans to conduct the vigilant operations and exercise protocols exhibited on previous RAMP cruises unless requested by the Monument to modify.

8. Procedures/Methods:

The proposed research cruise will use the NOAA research vessel Oscar Elton Sette as a platform and be in the Monument during the period between May 14, 2019 to September 30, 2019. The ESD utilizes several disciplines to comprehensively monitor various biota and environments associated with coral reefs. The primary research areas in 2019 are listed below with accompanying methodological descriptions: (1) Ocean and Climate Change, and (2) Reef-Associated Fish Communities

1.0 Ocean and Climate Change Monitoring
1.1 Subsurface Temperature Recorder (STR): Deployed at select locales to obtain high-resolution temperature data. We will be retrieving 58 STRs, and redeploying 39.
1.2 Diurnal Suite - We plan to conduct two of these in the NWHI. One at LIS (deployed - 5/18, retrieved - 5/27) and one at FFS (deployed - 5/16, retrieved - 5/30). They will each contain a moored CTD, SeaFET (pH sensor), ADCP (current profiler), dissolved oxygen sensor, PAR (photosynthetically active radiation) sensor, and an array of Portable Underwater Collectors (PUC) set to fire off at preprogrammed times, collecting a self contained water sample at various time-intervals throughout a 24 hr period. The unit is encapsulated in a stainless steel cage with self-contained milk crates and instruments attached with zipties, and carefully secured to a part of the reef hosting minimal biological cover (i.e. bare hard-bottom substrate).

1.3 Water Samples: These are collected throughout the cruise in conjunction with CTD casts. A total of 107 dissolved inorganic carbon (DIC) will be collected (one at every CAU and STR site, along with a possible subset of fish SPC sites). The volumes of seawater samples are 500mL per DIC sample and 250 mL per salinity/nutrient sample. Surface water, offshore and near reef water samples are collected at selected sites and later processed for each analyte. The total number of samples is variable and dependent upon work conditions, weather and unpredictable oceanographic occurrences. We estimate that an approximate total of 100 - 200 water samples (at presently unknown locations) will be collected. The location of all samples will be submitted in the cruise completion summary and the cruise report.

1.4 Calcification Accretion Units (CAUs): 20 total CAU sites (5 per island with 5 CAUs per site). These are instruments that allow for spatial and temporal evaluation of coral reef net calcification and productivity. These analyses are made by measuring the settlement of stony corals, crustose coralline algae and macroalgae. Settled organisms are removed from the ocean environment when a CAU is recovered. CAUs are photographed in the laboratory for community composition analysis and are dried and weighed to determine net calcification and productivity. Only organisms that have settled on the CAU are removed. No other impacts to the surrounding environment or substrate occur during removal.

1.5 Bioerosion Monitoring Unit (BMU): 8 total BMU sites (4 at FFS, 4 at PHR). Bioerosion rates are measured by attaching a calcium carbonate block (5 cm × 2 cm × 1 cm), known as a Bioerosion Monitoring Unit (BMU), to each installed CAU. The total number of blocks at each island will not exceed 25. These blocks act as settling substrate for bioeroding organisms. Prior to deployment, each block will be scanned by microCT (to create a 3D image of each block) and autoclaved; blocks will be retrieved during subsequent RAMP cruises. Retrieved blocks will be re-scanned by microCT and sampled for bioeroding organisms. Pre and post scans will be used to estimate bioerosion rates of the calcium carbonate reef framework. Bioerosion community composition will be measured using the ReefChip microarray. Only organisms that have settled on the BMU are removed from the reef ecosystem. No other impacts to the surrounding environment or substrate occur during removal.

2.0 Reef Fish Monitoring Noninvasive underwater-surveys are used to enumerate the diverse components of diurnally active shallow-water reef fish assemblages. This method (SPC) is replicated at randomly generated sites within and/or among the various habitat types present around each island or bank. Fish length-class is estimated for all quantified fish to provide an estimate of numerical size structure and biomass densities by taxa. No permanent markers, e.g. transect pins are used for either of the fish survey methods.

2.1 Stationary Point Counts (SPC): Stationary point counts are the principal method used by CRED to survey reef fish assemblages. At each site replicate SPC surveys are conducted by a pair of divers, surveying adjacent visually estimated cylinders of 7.5 m radius, centered on the divers. Each SPC diver records the number, size (TL, to nearest cm), and species of all fishes present or passing through the cylinder in the course of the survey. SPC surveys consists of 2 components: (i) a 5 minute species listing component –the aim of which is to build a list of species present or passing through the cylinder; and (ii) an enumeration component, in which each diver records the number and sizes of fishes of those listed species in a series of instantaneous visual sweeps of their cylinder. SPC Survey sites are randomly located with specified habitat strata encompassing all 0-30m hard-bottom areas at each surveyed reef-with specific positions generated prior to each cruise using a randomization tool and CREP's GIS

habitat and bathymetric layers. As described above, survey locations are re-randomized each time, hence no permanent site markers are needed.
2.2 Structure-from-Motion (SfM): After a survey is completed, divers record benthic habitat information within their respective cylindrical survey areas. Divers visually estimate habitat complexity, habitat type, and percentage of cover for hard corals, macroalgae, crustose coralline red algae, turf algae, and sand. Urchin densities are also estimated. Still photographs will be collected continuously 1m above the substrate over a 20 x 3m area across the transect area (~1000-2000 images per site). These images will be used to generate 3D models of the reef area using SfM and data will eventually be extracted to assess the coral demographic metrics such as density by taxon, size, partial mortality, prevalence of bleaching, diseases and other compromised states of health. We we will also extract 30 random photographs per site, which are later analyzed by ESD staff and partners using the computer program CoralNet. This analysis is the basis for estimating benthic cover and composition at each site (benthic habitat photographs at sites surveyed by the fish team are also analyzed using CoralNet). We will also extract habitat complextity information from each site. ESD is engaging in discussions with Dr. John Burns and colleagues at PMNM to discuss how the proposed surveys complement ongoing SfM research in PMNM.

NOTE: If land or marine archeological activities are involved, contact the Monument Permit Coordinator at the address on the general application form before proceeding, as a customized application will be needed. For more information, contact the Monument office on the first page of this application.

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:
1. Ocean and Climate Change Monitoring
1.1 Subsurface Temperature Recorder (STR) - NA
1.2 Portable Underwater Collector (PUC)
Water samples are not intended to collect biota, but incidentally collect various microscopic phytoplankton, zooplankton, bacteria, and viruses.
1.3 Water Samples
Water samples are not intended to collect biota, but incidentally collect various microscopic phytoplankton, zooplankton, bacteria, and viruses.
1.4 Calcification Accretion Units (CAUs)
CAUs measure the settlement and growth of stony corals, crustose coralline algae, macroalgae, other sessile benthic organisms. There are no specified species targeted for collection, and only the organisms that have settled on the CAU plates during the three-year deployment period are removed from the reef.
1.5 Bioerosion Monitoring Units (BMUs):

BMUs act as settling substrate for bioeroding organisms, including bivalve molluscs, sponges, and annelids. There are no specified species targeted for collection, and only the organisms that have settled on the BMUs during the three-year deployment are removed from the reef.

2.0 Reef Fish Monitoring

2.1 Stationary Point Counts (SPC) - NA

2.2 Structure-from-Motion -NA

Scientific name:

& size of specimens:

Collection location:

☐ Whole Organism ☐ Partial Organism

9b. What will be done with the specimens after the project has ended?
The specimens are moved from the field to a chest freezer aboard the research vessel, until they are offloaded for processing at the PIFSC. Processed samples are labeled and stored in the PIFSC Dry Archive room.

9c. Will the organisms be kept alive after collection? ☐ Yes ☒ No
Samples will be frozen immediately upon return to the research vessel after a day of operations and remain frozen until processing.

• General site/location for collections:
Four sites per island, one per cardinal direction (N, E, S, and W).

• 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?
No, each sample is placed into a separate container.

• Will organisms be released?
No

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

Samples are stored aboard the research vessel in individual sample containers within a scientific chest freezer.

11. Describe collaborative activities to share samples, reduce duplicative sampling, or duplicative research:
All data are made publicly available within one year of collection and archived with NCEI. CAUs and BMUs are deployed and analyzed in collaboration with NOAA Atlantic Oceanographic and Meterological Laboratory (AOML) and University of Miami in Miami, FL.

12a. List all specialized gear and materials to be used in this activity:
Small 4x4 inch PVC Plates (CAUs), small limestone pieces mounted on PVC (BMUs), Underwater Epoxy, DSLR cameras and housing for SfM

12b. List all Hazardous Materials you propose to take to and use within the Monument:
Very dilute Mercuric Chloride - HgCl2. Used for dissolved inorganic carbon water sampling and stored appropriately in double walled containers within Hazmat lockers.

13. Describe any fixed installations and instrumentation proposed to be set in the Monument:
For SfM surveys at fixed sites we will use existing pins where possible. If needed, we will install 1-2 stainless streel rods per site to establish the plot and facilitate future surveys to track change through time.

14. Provide a time line for sample analysis, data analysis, write-up and publication of information:
Sample analysis (instrument time series, CAUs, BMUs, water samples) is completed within 8 months of cruise termination, and data analysis and write-up are completed within 3 months thereafter. Data are publicly archived at NCEI within one year. Benthic cover data extracted from the SfM surveys will be provided within a year of collection. Methods for extracting coral demographic data from SfM surveys is still under development and may not be completed within a year.

15. List all Applicants' 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.

Signature Date

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

NOAA/Inouye Regional Center
NOS/ONMS/PMNM/Attn: Permit Coordinator
1845 Wasp Blvd, Building 176
Honolulu, HI 96818
FAX: (808) 455-3093

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

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):

Divers
Barkley, Hannah
Garriques, Joao
Halperin, Ariel
Morioka, James
Pomeroy, Noah
Reardon, Kerry
Wester, Tate
Winston, Morgan

Data manager
Akridge, Michael

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

See attached file with instrumentation sites (NWHI_OCCsites.csv)

3. Other permits (list and attach documentation of all other related Federal or State permits):

None

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.

NA

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

All funding comes from an annual budget of the United States Federal Government for the National Oceanic and Atmospheric Administration.

5. Time frame:
Activity start: 20 August 2019
Activity completion: 7 September 2019

Dates actively inside the Monument:
From: 20 August 2019
To: 7 September 2019

Describe any limiting factors in declaring specific dates of the proposed activity at the time of application:

The ship's schedule is subject to change due to weather delays and changes in project schedules.

Personnel schedule in the Monument:

See list above

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:

The U.S. Federal Government is self-insured.

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

X Vessel
☐Aircraft

Provide Vessel and Aircraft information:
NOAA Ship Rainier, IMO #6711003

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:

NA (we are working off NOAA ship and small boats)

Additional Information for Land Based Operations

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

12. Room and board requirements on island:

13. Work space needs:

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 HAWAI'I

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

ROBERT MASUDA
FIRST DEPUTY

KALEO MANUEL
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
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

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

August 09, 2019

TO: Division of Aquatic Resources File

THROUGH: Suzanne D. Case, Chairperson

FROM: Maria Carnevale
Papahānaumokuākea Marine National Monument

SUBJECT:
DECLARATION OF EXEMPTION FROM THE PREPARATION OF AN ENVIRONMENTAL ASSESSMENT UNDER THE AUTHORITY OF CHAPTER 343, HRS AND CHAPTER 11-200 HAR, FOR PAPAHĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT RESEARCH PERMIT TO JENNIFER SAMSON, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, PACIFIC ISLANDS FISHERIES SCIENCE CENTER, FOR ACCESS TO STATE WATERS TO CONDUCT ACTIVITIES FOR THE PACIFIC REEF ASSESSMENT AND MONITORING PROGRAM UNDER PERMIT PMNM-2019-013.

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 Jennifer Samson, National Oceanic and Atmospheric Administration, Pacific Islands Fisheries Science Center, for Access to State Waters to Conduct Activities for the Pacific Reef Assessment and Monitoring Program.

Permit Number: PMNM-2019-013

Project Description:

The activities covered under this permit would occur between August 10, 2019 and August 9, 2020.

The Applicant and the proposed reef assessment and monitoring activities are largely a renewal of work previously permitted and conducted in the Monument.

INTENDED ACTIVITIES

Dr. Russell Brainard (applicant) proposes to conduct reef assessment and monitoring activities within the Monument, as part of the Pacific Reef Assessment and Monitoring Program (RAMP) from 8/20/2019 - 9/7/2019 on a research cruise aboard NOAA Ship RAINIER (separate permit application underway). A total of 23 trained researchers would conduct activities from 0 - 30 m. depth at randomly selected sites at French Frigate Shoals, Lisianski Island, Pearl and Hermes Atoll, and Kure Atoll.

The primary research areas include 1) ocean and climate change; 2) benthic communities; 3) non- coral invertebrates; and 4) reef-associated fish communities. Specific proposed research activities within these four areas are listed below:

Ocean and Climate Change Monitoring

- Perform conductivity, temperature, and depth recorder (CTD) casts to gather depth profiles of temperature and salinity in shallow-water environments.
- Conduct water sampling efforts in conjunction with CTD casts at coral reef survey sites to quantify the carbonate system present
- Recover and replace instrumentation to assess and monitor changes in calcification and bioerosion rates measured within the reef community. This information will help assess the response of coral reef ecosystems to climate change and ocean acidification.
- Complete maintenance, replacement and installation of various oceanographic instrument arrays that have been long-term scientific features at permanent survey sites.
- Use photomosaics (Structure-for-Motion, 'SfM') to collect coral community composition data at the climate stations and contextualize any physical and/or biological changes recorded at the climate stations over time.
- Habitat characterization of the permanent sites.

Reef Fish Monitoring

- Gather data sufficient to assess status and trends of Pacific reef fish populations.
- Provide the basis for meaningful comparison of reef fish stocks across the PNMN.
- Provide the basis needed to assess the response (or potential response) of reef fish communities to possible ecosystem impacts such as fishing, ecotourism, pollution, habitat damage, sedimentation, and hurricanes.
- Conduct SfM surveys at each site to assess habitat complexity, coral demography and benthic cover.

The proposed activities directly benefit the Monument through 3.1.1 – Marine Conservation Science Action Plan (Strategy MCS-1: Continuing to enhance research, characterization and monitoring of marine ecosystems for the life of the plan, as appropriate, and Strategy MCS-2: Assess and prioritize research and monitoring activities over the life of the plan). These research activities are part of a long-term monitoring strategy to document and assess changes in the Monument's reef habitats and ocean chemistry over time.

The proposed activities are in direct support of the Monument Management Plan's (MMP) priority management needs through 3.1.1 – Marine Conservation Science Action Plan (Strategy MCS-1: Continuing to enhance research, characterization and monitoring of marine ecosystems for the life of the plan, as appropriate, and Strategy MCS-2: Assess and prioritize research and monitoring activities over the life of the plan). Strategy MCS-1 focuses on "continuing marine research, characterization, and monitoring designed to support an ecosystem-based approach to protection and management" and for the continuation of characterizing "types and spatial distributions of shallow-water marine habitats to inform protection and management efforts". Strategy MCS-2 calls specifically for integrating collaborative "independent monitoring initiatives…such as…water chemistry and water quality". Reef assessment and monitoring activities and associated long-term data sets such as those proposed fit into these two strategies of the MMP. Activities such as those to be carried out by the permittee, are also addressed in the Monument Management Plan Environmental Assessment (December 2008) which resulted in a FONSI.

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 Native Hawaiian Cultural Working Group. In addition, the permit application has been posted on the Monument Web site since March 20, 2019, 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 surveys and collections, 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. Since this permit involves an activity that is precedent to a later planned activity (i.e. the recovery of Subsurface Temperature Recorders (STRs), Calcification Accretion Units (CAUs), and Bioerosion Monitoring Units (BMUs)), the categorical exemption determination here will treat all planned activities as a single action.

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 exemption class has been interpreted to include fish collection for marine surveys and research, falling under Exemption Class #5, Exempt Item #15 which allows "aquatic life surveys, inventory studies, new transect lines, photographing, recording, sampling, collection, culture and captive propagation." It is also interpreted to include mapping activities under Exemption Class #5, Exempt Item #2 "Non-destructive data collection and inventory, including field, aerial and satellite surveying and mapping." (DEPARTMENT OF LAND & NATURAL RESOURCES, EXEMPTION LIST, published June 5, 2015).

As discussed below, no significant disturbance to any environmental resource is anticipated in the sampling 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.

The activities would be a continuation of work previously conducted by the Applicant, which involves accessing the Monument's shallow water coral reefs (≤30 m.) to conduct rapid ecological assessments. The Applicant has received permits to conduct similar work in 2008, 2010, and 2013, and is likely to request future permits to continue this work. This study involves reef assessment and monitoring activities, including oceanographic seawater sampling, benthic surveys, instrument installation/retrieval, removal of coral and non-coral invertebrates and sampling equipment, and the opportunistic collection of crown-of-thorns sea stars. Minimal impact to the benthos is expected. 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 would 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 RAINIER (permit application under review).

All other permits active during that time period and at those locations 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.

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.

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

May 24, 2019

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. Russell E. Brainard, National Oceanic and Atmospheric Administration, Pacific Island Fisheries Center, for Access to State Waters to Conduct Activities for the Pacific Reef Assessment and Monitoring Program

The Division of Aquatic Resources (DAR) hereby submits a request for your authorization and approval for issuance of a Papahānaumokuākea Marine National Monument research permit to Dr. Russell Brainard, Chief of the Coral Reef Ecosystem Program, of the National Oceanic and Atmospheric Administration (NOAA), Pacific Island Fisheries Science Center, 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 research 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:

- French Frigate Shoals
- Lisianski Island
- Pearl and Hermes Atoll
- Kure Atoll

The activities covered under this permit would occur between August 1, 2019 and July 31, 2020.

The Applicant and the proposed reef assessment and monitoring activities are largely a renewal of work previously permitted and conducted in the Monument.

INTENDED ACTIVITIES

Dr. Russell Brainard (applicant) proposes to conduct reef assessment and monitoring activities within the Monument, as part of the Pacific Reef Assessment and Monitoring Program (RAMP) from 8/20/2019 - 9/7/2019 on a research cruise aboard NOAA Ship RAINIER (separate permit application underway). A total of 23 trained researchers would conduct activities from 0 - 30 m. depth at randomly selected sites at French Frigate Shoals, Lisianski Island, Pearl and Hermes Atoll, and Kure Atoll.

☒ 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 March 20, 2019 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. OHA appreciates the research being done in Papahānaumokuākea to assess conditions of the resources there. To share this important work and to update our beneficiaries, are there links, documents, or published articles of past research findings to share with interested community members?

Response: A general overview of RAMP activities in Papahānaumokuākea can be found here:

- https://www.pifsc.noaa.gov/cred/pacific_ramp.php

A number of data/cruise reports from prior research in Papahānaumokuākea are readily available for public review. For example:

- Pacific Reef Assessment and Monitoring Program Data Report Ecological monitoring 2017-reef fishes and benthic habitats of the Northwestern Hawaiian Islands, Pacific Remote Islands Marine National Monument, and the Mariana Archipelago

  Link:https://repository.library.noaa.gov/view/noaa/17546/noaa_17546_DS1.pdf?

Detailed team-specific methodological information, along with public access to raw and metadata archives, can be obtained through NOAA CoRIS. For example:

- Pacific Islands Fisheries Science Center, 2019: Pacific Reef Assessment and Monitoring Program: Water Chemistry of the Coral Reefs across the U.S.-affiliated Pacific Islands from Water Samples collected from 2012 to 2014.

  Link: https://inport.nmfs.noaa.gov/inport/item/25253.

The 2013 and 2014 data overlap with the following NCRMP accessions:

- Hawaiian Archipelago 2013: Accession 0157714.
  Link: https://inport.nmfs.noaa.gov/inport/item/36067

An additional example for reef fishes is noted below:

- Pacific Islands Fisheries Science Center, 2019: Pacific Reef Assessment and Monitoring Program: Stratified Random Surveys (StRS) of Reef Fish, including Benthic Estimate Data at Coral Reef Sites across the Pacific Ocean from 2007 to 2012,
  Link: https://inport.nmfs.noaa.gov/inport/item/34515.

Finally, data from prior research in Papahānaumokuākea has been published, in comparison with the Main Hawaiian Islands and/or US-Pacific Territories, in a number of open-access manuscripts. For example:

- Nadon MO, Ault JS, Williams ID, Smith SG, DiNardo GT (2015) Length-Based Assessment of Coral Reef Fish Populations in the Main and Northwestern Hawaiian Islands. PLoS ONE 10(8): e0133960. https://doi.org/10.1371/journal.pone.0133960

2. How will the loss of Hi'ialakai impact the proposed activities? Are any likely to be canceled?

Response: The first mission to the Papahānaumokuākea by the *Hi'ialakai* occurred in 2004, and our program was lucky to have successfully sailed with her over the course of the past 14 years.

The loss of the *Hi'ialakai* will, in the immediate term, be mitigated with the activation/ availability of the NOAA research vessel *Rainier*, which is slated to arrive in Hawaii ~ 06/30/19.

Our current mission profile calls for HARAMP field activities to fall between 08/20/19 – 09/07/19 (19 Days at Sea), whereby a.) NMFS/CRCP will have 2 launches (Hi'ialakai-transferred jetboats) available for HARAMP operations, b.) NOS will have 2 launches (*Rainier* assets) involved with mapping activities (covered independently under a *Rainier* PMNM permit application).

That mission would be led by Chief Scientist Hannah Barkley.

For RAMP-related research activities in Papahānaumokuākea, those would primarily focus on previously described OCC (oceanographic climate change) elements in our original Papahānaumokuākea permit application. These include: instrumentation swap-outs, water sampling/carbonate chemistry, CTD casts, and Structure-for-Motion photogrammetry. Currently, we do not expect underwater visual assessments of benthic habitats/fish populations.

3. Question 14 (p. 16) asks, "Provide a timeline for sample analysis, data analysis, write-up, and publication of information." Where will the write up be published, and how will your findings and conclusion be communicated to managers?

Instrument data (STR, CTD, and diel suite) will be downloaded and fully processed by the end of the cruise. CAUs will be analyzed at PIFSC. Water samples will be sent to the NOAA Pacific Marine Environmental Laboratory (PMEL) for analysis, and BMUs will be sent to the NOAA Atlantic Oceanographic and Meteorological Laboratory (AOML). The anticipated time frame for the completion of CAU, BMU, and water sample analyses is 6 to 8 months following cruise termination. Submission of all data sets to NCEI (STR, CTD, diel suite, water samples, CAUs, BMUs) will be completed within one year. A summary brief, describing field activities conducted during the cruise and initial results, will be produced within 3 months of the mission end date and distributed to partners and managers.

COMMENTS:

1. Please follow quarantine and sterilization procedures implicitly to prevent the spread of diseases and invasive species from one site to another.

   Understood

2. If any anchoring occurs with small boats use BMPs for anchoring: Only anchor in sand patches, swimming anchor down (if possible) and guide it so that reef is not adversely affected. Make sure anchor chain or line is not rubbing on the reef or breaking coral.

   Understood

3. No objections to the proposed activities as described. The PI has demonstrated that the team is capable of conducting all of the activities without adverse impacts to the Monument and its resources.

   Noted and thank you

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 consultation pursuant to section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. §1531 *et seq.*) is underway to analyze the effects of proposed activities within the Monument on listed species and designated critical habitat. 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 of all aforementioned activities following section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA; 16 U.S.C. 1855(b)) is underway to analyze the effects of proposed activities within the Monument on essential fish habitat. 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.
- The Department has made an exemption determination for this permit in accordance with 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 PAPAHĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT RESEARCH PERMIT TO DR. RUSSELL E. BRAINARD, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, PACIFIC ISLANDS FISHERIES SCIENCE CENTER, FOR ACCESS TO STATE WATERS TO CONDUCT ACTIVITIES FOR THE PACIFIC REEF ASSESSMENT AND MONITORING PROGRAM UNDER PERMIT PMNM-2019-013").

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-2008-062, PMNM-2010-052, PMNM-2013-024 to conduct similar work in 2008, 2010, and 2013 respectively. In addition, the Applicant has previously held permits for similar activities in the Monument under permits NWHINM-2006-011 and NWHINM-2006-015.

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 the following 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. Russell E. Brainard, Chief of the Coral Reef Ecosystem Program, of the National Oceanic and Atmospheric Administration (NOAA), Pacific Island Fisheries Center, with the following special conditions:

a. 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.

b. 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.

c. 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.

d. 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.

e. 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.

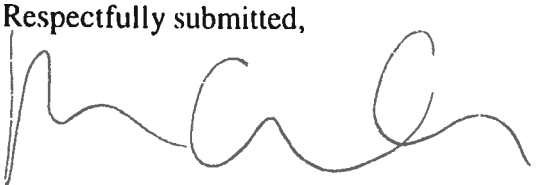
f. Tenders and small vessels must be equipped with engines that meet EPA emissions requirements.

g. 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.

h. If there is any Hawaiian monk seal or any other protected species in the area when performing any permitted activity shall cease until the animal(s) depart the area, except as permitted for specific management of that species.

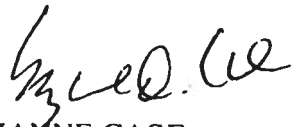
i. No fishing is allowed in State Waters except as authorized under State law for subsistence, traditional and customary practices by Native Hawaiians.

Respectfully submitted,



Maria Carnevale
Papahānaumokuākea Marine National Monument

APPROVED FOR SUBMITTAL



SUZANNE CASE
Chairperson

Papahānaumokuākea Marine National Monument

RESEARCH 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:
NOAA/Inouye Regional Center
NOS/ONMS/PMNM/Attn: Permit Coordinator
1845 Wasp Blvd, Building 176
Honolulu, HI 96818
nwhipermit@noaa.gov
PHONE: (808) 725-5800 FAX: (808) 455-3093

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: Russell E. Brainard, Ph.D.
Affiliation: Program Lead; National Oceanic and Atmospheric Administration (NOAA), Pacific Islands Fisheries Science Center (PIFSC), Ecosystem Sciences Division (ESD)

Permit Category: Research
Proposed Activity Dates: 14 May 2019 to 30 September 2019. 20 day research mission within that time frame. Subject to vessel (Oscar Elton Sette) availability.
Proposed Method of Entry (Vessel/Plane): Vessel/Oscar Elton Sette
Proposed Locations: Shallow water reefs (<30m) of the Papahānaumokuākea Marine National Monument (Monument) including the reefs associated with: Kure Atoll, Pearl & Hermes Atoll, French Frigate Shoals, and Lisianski Island.

Estimated number of individuals (including Applicant) to be covered under this permit: 20 - 23

Estimated number of days in the Monument: 20

Description of proposed activities: (complete these sentences):

a.) The proposed activity would...
conduct reef assessment and monitoring activities throughout the islands and atolls of the Monument. These efforts would contribute to continuing research providing scientific information needed to support ecosystem approaches to the management of coral reef systems of the Monument and areas across the Pacific region. The primary focus of the multi-institutional team of scientists, led by NOAA Pacific Islands Fisheries Science Center's Ecosystem Sciences Division (ESD- formally Coral Reef Ecoystem Program), would focus on implementing the Pacific Reef Assessment and Monitoring Program (RAMP).

b.) To accomplish this activity we would ....
use monitoring efforts including rapid ecological assessments of fish to species or genus level using stationary point count (SPC) methods; generalized assessments of benthic biological cover (i.e. complexity, hard-coral cover) to occur concurrently with fish SPC surveys; Structure-from-

Motion (SfM) surveys to eventually extract coral demographic data from; and multi-platform oceanographic and water quality monitoring using shipboard surveys, and moored instrument arrays.

c.) This activity would help the Monument by …
the use of consistent interdisciplinary methods across this vast region allowing for an opportunity to perform biogeographic and ecological comparative analyses of diverse ecological, environmental, and oceanographic gradients. Patterns of variability of fish biomass, diversity, and other reef metrics are paramount to assessing an ecological system as valuable as those in the Monument.

Other information or background:
ESD conducts integrated, multidisciplinary, ecosystem research, habitat mapping, and long-term monitoring of coral reef ecosystems throughout American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, the Hawaiian Archipelago and the Pacific Remote Island Areas. This work is part of the NOAA Coral Reef Conservation Program's (CRCP) broad-scale Pacific RAMP surveys. In the past, ESD's efforts under RAMP have involved extensive benthic habitat mapping, ecological and environmental assessment and monitoring, and applied research to support improved ecosystem-based management and conservation. The RAMP efforts have historically focused on several priority research themes: 1) ocean and climate change; 2) benthic communities (with emphasis on hard corals); and 3) non-coral invertebrates; and 4) reef-associated fish communities. Monitoring of ocean and climate change focuses on thermal structure and water chemistry and is achieved by means of sustained, remotely sensed and in situ observations of ocean temperature, autonomous discrete water sampling for analyses of carbonate chemistry, and distinct biological installations designed to provide integrated, ecosystem-wide response data (e.g., biodiversity, calcification, and bioerosion) in the context of climate change. Biological monitoring for benthic and fish communities is conducted at Rapid Ecological Assessment (REA) sites using a two-stage stratified random sampling design throughout shallow-water (0–30 m), hard-bottom coral reef habitats. The knowledge gained from these methods is shared with resource managers and various public stakeholders to improve decision-making for long-term conservation and management of coral reef resources.

Section A - Applicant Information

1. Applicant

Name (last, first, middle initial): Brainard, Russell E., Ph.D.

Title: Program Lead, Coral Reef Ecosystem Program, Ecosystem Sciences Division, NOAA Pacific Islands Fisheries Science Center

1a. Intended field Principal Investigator (See instructions for more information):
Hannah Barkley, Ph.D. Alternate: Jacob Asher, Ph.D.

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

[redacted]

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

3. Affiliation (institution/agency/organization directly related to the proposed project):
NOAA Pacific Islands Fisheries Science Center, Ecosystem Sciences Division (ESD)

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):
Staffing for has not been finalized yet, but the following list reflects our current plan. We will provide an updated list when our roster is confirmed.

OCEAN AND CLIMATE CHANGE
1.) Hannah Barkley
2.) Noah Pomeroy
3.) Ari Halperin
4.) Joao Garriques
5.) Morgan Winston
6.) Laura Rock

7.) Kevin O'Brien
8.) James Morioka

REEF FISH MONITORING
9.) Kaylyn McCoy
10.) Tate Wester
11.) Keo Lopes
12.) Stephen Matadobra
13.) Ivor Williams
14.) Andrew Gray
15.) TBD (DAR? QUEST?)
16.) Jacob Asher

PHOTOMOSAICS (STRUCTURE FOR MOTION)

17.) Scripps Institute of Oceanography (TBD)
18.) James Barlow
19.) Mollie Asbury

Divemaster/Chamber Operator
20.) Stephen Matadobra or NDC designate

Data Management
21.) Michael Akridge
22.) Brooke Olenski

CTD/Night Ops
23.) TBD

SST Berth
24.) TBD

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			

☐ Remaining ashore on any island or atoll (with the exception of Midway & Kure Atolls and Field Camp staff on other islands/atolls) between sunset and sunrise.

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

Location Description:
ESD's multidisciplinary monitoring teams collect data in shallow water environments from surface levels to 30 m depths. These teams plan to survey approximately 75 - 120 sites throughout the Monument to investigate the various coral reef environments in forereef, backreef and lagoon habitats. Sites will be identified prior to the cruise, and a list of positions will be submitted in the compliance form.

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 Coral Reef Conservation Act of 2000 created a national program and authorized NOAA to conduct mapping, monitoring, assessment, restoration, and scientific research that benefit the understanding, sustainable use, and long-term conservation of coral reefs and coral reef ecosystems. As part of the mandate, ESD leads coral reef ecosystem monitoring efforts in several U.S.-affiliated jurisdictions in the Pacific, including in the Monument. ESD proposes to continue its previous Pacific RAMP efforts in the Northwestern Hawaiian Islands (NWHI) by conducting coral reef ecosystem monitoring, which includes biological and oceanographic observations. In order to properly study the coral reefs and related waters of the Monument, ESD utilizes several disciplines to monitor the various biota and environments. The research areas that will be the primary focus for 2019 PMNM research activities are listed below: 1) ocean and climate change; and 2) reef-associated fish communities.

1. Ocean and Climate Change Monitoring
Long-term time series of physical oceanographic data, supplemented by discrete biological and geochemical sampling, enables characterization of the oceanographic regime within which coral reef ecosystems reside and provide important context to spatial and temporal ecological observations. Specifically, seawater carbonate chemistry (calculated from the dissolved inorganic carbon and total alkalinity concentrations in seawater) of coral reefs helps scientists understand the potential effects of ocean acidification, and temperature sensors on the seafloor record thermal structure of the water column surrounding the reefs and provide insight into thermal stress on coral reef environments and its potential role in coral bleaching events. Additional oceanographic sensors measuring waves, currents, dissolved oxygen, light levels, pH, and turbidity, provide important ancillary data for understanding oceanographic conditions influencing the coral reef ecosystems that the ESD monitors.

Objectives:
- Perform conductivity, temperature, and depth recorder (CTD) casts to gather depth profiles of temperature and salinity in shallow-water environments.
- Conduct water sampling efforts in conjunction with CTD casts at coral reef survey sites to quantify the carbonate system present at the reef ecosystems ESD visits.
- Recover and replace instrumentation to assess and monitor changes in calcification and bioerosion rates measured within the reef community. This information will help assess the response of coral reef ecosystems to climate change and ocean acidification.
- Complete maintenance, replacement and installation of various oceanographic instrument arrays that have been long-term scientific features at permanent survey sites.
- Use photomosaics (Structure-for-Motion, 'SfM') to collect coral community composition data at the climate stations and contextualize any physical and/or biological changes recorded at the climate stations over time.
- Habitat characterization of the permanent sites.

2. Reef Fishes:
Quantitative assessment and monitoring of shallow reef fish assemblages is an integral part of the ESD'S mission to improve our scientific understanding of these fish resources, and to

contribute to the scientific basis necessary for sound management. Currently, triennial monitoring surveys are conducted at each geographic sub-region (e.g. American Samoa, Hawaiian Archipelago) to document status and trends in reef fish assemblages. Habitat types surveyed encompass a wide range of habitats within ESD's survey domain (i.e. 0–30 m hard-bottom). Survey sites are determined via a stratified-random sampling scheme; the majority of sites are located on outer reef slopes. Inventories and assessments of shallow reef fishes have been completed by ESD at 40 U.S.-affiliated Pacific islands, and monitoring is ongoing. Continued updating of data, and analysis of this growing database will enable species-specific numerical and biomass densities to be calculated, fish assemblage structure to be described at various spatial and temporal scales, and statistical correlations to be determined. Further analysis of ESD's oceanographic and biological data will aid in understanding patterns of fish distribution and abundance as well as ecosystem associations.

Objectives:

- Gather data sufficient to assess status and trends of Pacific reef fish populations.
- Provide the basis for meaningful comparison of reef fish stocks across the PNMN.
- Provide the basis needed to assess the response (or potential response) of reef fish communities to possible ecosystem impacts such as fishing, ecotourism, pollution, habitat damage, sedimentation, and hurricanes.
- Conduct SfM surveys at each site to assess habitat complexity, coral demography and benthic cover.

Intended Use of Results:
Pacific RAMP research cruises are conducted in collaboration with colleagues and partners from other NOAA offices; Federal, State, and Territorial agencies; academia, industry, and nongovernmental organizations. These partnerships are essential to the effectiveness of long-term ecosystem monitoring in the region since they bring together scientists and managers with expertise and experience with a broad range of scientific and management issues. The data collected on this cruise are pivotal to long-term biological and oceanographic monitoring of coral reef ecosystems in the U.S. Pacific and the Monument. This 2019 expedition will add to information collected during baseline, monitoring and mapping surveys conducted in the NWHI between 2002 and 2016. In particular, data on the abundance and spatial distribution of reef fishes will allow scientists to evaluate potential changes in the condition and integrity of coral reef ecosystems in the region and enable managers to more effectively manage and conserve reef-associated biota.

*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?

There will be little to no adverse impacts on the Monument cultural, natural and historic resources, qualities and ecological integrity from the proposed activities. All intended activities contribute significantly to an understanding of the ecosystems within the Monument. ESD conducts RAMP cruises with the intent to provide scientific data needed to support management of the Monument through cruise reports and coral reef ecosystem monitoring reports. ESD team members conduct monitoring reef surveys with little to no adverse impacts to the natural resources of the Monument. The scientific objectives are to observe the natural habitat with minimal disturbance and to only come in contact with resources in limited occurrences to further comprehensive understanding and research in the Monument. In addition, team members attend a Hawaiian Cultural Briefing each year before entering the Monument waters. This education instills an awareness of the natural, cultural and historical values the Monument holds. Also, the NOAA research ship Oscar Elton Sette has informative cultural literature provided by the Office of Hawaiian Affairs and the Monument for personnel seeking further knowledge or who may not be able to attend the briefings.

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?

All management regulations pertaining to the Monument are strictly adhered to when conducting operations within the Monument (such as disease mitigation regulations) and in Special Preservation Areas. The PIFSC and ESD supply trained, knowledgeable and experienced researchers who are aware of and educated about the Monument's cultural, natural and historic resources, qualities and ecological integrity through cultural educators, partnerships with the co-trustees, and will act accordingly to enhance the management of the Monument. To the knowledge of PIFSC and ESD, there will be no indirect, secondary, or cumulative effects on the Monument's cultural, natural and historic resources, qualities and ecological integrity from the proposed activities. All activities proposed provide critical data that will greatly enhance the ability of Monument managers to characterize and understand the ecosystems within the Monument. As stated, all scientific methods that will be used on this cruise are designed to have minimal, if any, negative effects on the environment or cultural resources. The fundamental

goals of conservation and management are of utmost importance to the intended research, and no work outside of permitted activities shall be considered.

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.

There is no practicable alternative to conducting the research within the Monument because monitoring data gathered from this research pertains to the area being managed and is to be utilized by the Monument.

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 will be little to no adverse impacts on the Monument cultural, natural and historic resources, qualities and ecological integrity from the proposed activities. All intended activities contribute significantly to an understanding of the ecosystems within the Monument. ESD conducts RAMP cruises with the intent to provide scientific data needed to support management of the Monument through cruise reports and coral reef ecosystem monitoring reports.

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

The upcoming RAMP cruise will use the minimum amount of time needed within Monument waters to complete the required work. Due to the considerable size of the Monument and the transit time between locations, the planned schedule will maximizes the amount of operational days available.

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

RAMP cruises have been successfully conducted on an annual basis in the NWHI since 2000 in conjunction with the co-trustees of the Monument. Team members are experienced divers and highly trained personnel who will be under the guidance of the Chief Scientist Personnel from ESD have been collecting monitoring data with little to no adverse impacts to the natural resources of the islands. (Biography attached).

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.

RAMP operations are funded by yearly grants from the NOAA ESD to the ESD, which is a part of the PIFSC. PIFSC contributes in-kind to the foundation and activities conducted by the ESD. Collaborators and partners also supply personnel and effort through their own funding.

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.

Standardized survey procedures are employed during operations. A dive plan is being formulated and all NOAA diving procedures will be followed. For each discipline there are procedure manuals, including safety instructions, for both ship and diving operation that are followed and enforced. RAMP cruises are conducted with the intention of monitoring and assessing the coral reef ecosystem with negligible impact to Monument resources. It is important to note that the methods used have shown to have little impact on the habitat being observed through various cruises and reports.

i. Has your vessel been outfitted with a mobile transceiver unit approved by OLE and complies with the requirements of Presidential Proclamation 8031?

Under a separate permit, the Oscar Elton Sette is outfitted with a mobile transceiver unit.

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

We are not aware of any other factors that would make the issuance of a permit for the activity inappropriate. CREP plans to conduct the vigilant operations and exercise protocols exhibited on previous RAMP cruises unless requested by the Monument to modify.

8. Procedures/Methods:

The proposed research cruise will use the NOAA research vessel Oscar Elton Sette as a platform and be in the Monument during the period between May 14, 2019 to September 30, 2019. The ESD utilizes several disciplines to comprehensively monitor various biota and environments associated with coral reefs. The primary research areas in 2019 are listed below with accompanying methodological descriptions: (1) Ocean and Climate Change, and (2) Reef-Associated Fish Communities

1.0 Ocean and Climate Change Monitoring
1.1 Subsurface Temperature Recorder (STR): Deployed at select locales to obtain high-resolution temperature data. We will be retrieving 58 STRs, and redeploying 39.
1.2 Diurnal Suite - We plan to conduct two of these in the NWHI. One at LIS (deployed - 5/18, retrieved - 5/27) and one at FFS (deployed - 5/16, retrieved - 5/30). They will each contain a moored CTD, SeaFET (pH sensor), ADCP (current profiler), dissolved oxygen sensor, PAR (photosynthetically active radiation) sensor, and an array of Portable Underwater Collectors (PUC) set to fire off at preprogrammed times, collecting a self contained water sample at various time-intervals throughout a 24 hr period. The unit is encapsulated in a stainless steel cage with self-contained milk crates and instruments attached with zipties, and carefully secured to a part of the reef hosting minimal biological cover (i.e. bare hard-bottom substrate).

1.3 Water Samples: These are collected throughout the cruise in conjunction with CTD casts. A total of 107 dissolved inorganic carbon (DIC) will be collected (one at every CAU and STR site, along with a possible subset of fish SPC sites). The volumes of seawater samples are 500mL per DIC sample and 250 mL per salinity/nutrient sample. Surface water, offshore and near reef water samples are collected at selected sites and later processed for each analyte. The total number of samples is variable and dependent upon work conditions, weather and unpredictable oceanographic occurrences. We estimate that an approximate total of 100 - 200 water samples (at presently unknown locations) will be collected. The location of all samples will be submitted in the cruise completion summary and the cruise report.

1.4 Calcification Accretion Units (CAUs): 20 total CAU sites (5 per island with 5 CAUs per site). These are instruments that allow for spatial and temporal evaluation of coral reef net calcification and productivity. These analyses are made by measuring the settlement of stony corals, crustose coralline algae and macroalgae. Settled organisms are removed from the ocean environment when a CAU is recovered. CAUs are photographed in the laboratory for community composition analysis and are dried and weighed to determine net calcification and productivity. Only organisms that have settled on the CAU are removed. No other impacts to the surrounding environment or substrate occur during removal.

1.5 Bioerosion Monitoring Unit (BMU): 8 total BMU sites (4 at FFS, 4 at PHR). Biocrosion rates are measured by attaching a calcium carbonate block (5 cm × 2 cm × 1 cm), known as a Bioerosion Monitoring Unit (BMU), to each installed CAU. The total number of blocks at each island will not exceed 25. These blocks act as settling substrate for bioeroding organisms. Prior to deployment, each block will be scanned by microCT (to create a 3D image of each block) and autoclaved; blocks will be retrieved during subsequent RAMP cruises. Retrieved blocks will be re-scanned by microCT and sampled for bioeroding organisms. Pre and post scans will be used to estimate biocrosion rates of the calcium carbonate reef framework. Bioerosion community composition will be measured using the ReefChip microarray. Only organisms that have settled on the BMU are removed from the reef ecosystem. No other impacts to the surrounding environment or substrate occur during removal.

2.0 Reef Fish Monitoring Noninvasive underwater-surveys are used to enumerate the diverse components of diurnally active shallow-water reef fish assemblages. This method (SPC) is replicated at randomly generated sites within and/or among the various habitat types present around each island or bank. Fish length-class is estimated for all quantified fish to provide an estimate of numerical size structure and biomass densities by taxa. No permanent markers, e.g. transect pins are used for either of the fish survey methods.

2.1 Stationary Point Counts (SPC): Stationary point counts are the principal method used by CRED to survey reef fish assemblages. At each site replicate SPC surveys are conducted by a pair of divers, surveying adjacent visually estimated cylinders of 7.5 m radius, centered on the divers. Each SPC diver records the number, size (TL, to nearest cm), and species of all fishes present or passing through the cylinder in the course of the survey. SPC surveys consists of 2 components: (i) a 5 minute species listing component –the aim of which is to build a list of species present or passing through the cylinder; and (ii) an enumeration component, in which each diver records the number and sizes of fishes of those listed species in a series of instantaneous visual sweeps of their cylinder. SPC Survey sites are randomly located with specified habitat strata encompassing all 0-30m hard-bottom areas at each surveyed reef-with specific positions generated prior to each cruise using a randomization tool and CREP's GIS

habitat and bathymetric layers. As described above, survey locations are re-randomized each time, hence no permanent site markers are needed.
2.2 Structure-from-Motion (SfM): After a survey is completed, divers record benthic habitat information within their respective cylindrical survey areas. Divers visually estimate habitat complexity, habitat type, and percentage of cover for hard corals, macroalgae, crustose coralline red algae, turf algae, and sand. Urchin densities are also estimated. Still photographs will be collected continuously 1m above the substrate over a 20 x 3m area across the transect area (~1000-2000 images per site). These images will be used to generate 3D models of the reef area using SfM and data will eventually be extracted to assess the coral demographic metrics such as density by taxon, size, partial mortality, prevalence of bleaching, diseases and other compromised states of health. We we will also extract 30 random photographs per site, which are later analyzed by ESD staff and partners using the computer program CoralNet. This analysis is the basis for estimating benthic cover and composition at each site (benthic habitat photographs at sites surveyed by the fish team are also analyzed using CoralNet). We will also extract habitat complextity information from each site. ESD is engaging in discussions with Dr. John Burns and colleagues at PMNM to discuss how the proposed surveys complement ongoing SfM research in PMNM.

NOTE: If land or marine archeological activities are involved, contact the Monument Permit Coordinator at the address on the general application form before proceeding, as a customized application will be needed. For more information, contact the Monument office on the first page of this application.

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:
1. Ocean and Climate Change Monitoring
1.1 Subsurface Temperature Recorder (STR) - NA
1.2 Portable Underwater Collector (PUC)
Water samples are not intended to collect biota, but incidentally collect various microscopic phytoplankton, zooplankton, bacteria, and viruses.
1.3 Water Samples
Water samples are not intended to collect biota, but incidentally collect various microscopic phytoplankton, zooplankton, bacteria, and viruses.
1.4 Calcification Accretion Units (CAUs)
CAUs measure the settlement and growth of stony corals, crustose coralline algae, macroalgae, other sessile benthic organisms. There are no specified species targeted for collection, and only the organisms that have settled on the CAU plates during the three-year deployment period are removed from the reef.
1.5 Bioerosion Monitoring Units (BMUs):

BMUs act as settling substrate for bioeroding organisms, including bivalve molluscs, sponges, and annelids. There are no specified species targeted for collection, and only the organisms that have settled on the BMUs during the three-year deployment are removed from the reef.

2.0 Reef Fish Monitoring

2.1 Stationary Point Counts (SPC) - NA

2.2 Structure-from-Motion -NA

Scientific name:

& size of specimens:

Collection location:

☐ Whole Organism ☐ Partial Organism

9b. What will be done with the specimens after the project has ended?
The specimens are moved from the field to a chest freezer aboard the research vessel, until they are offloaded for processing at the PIFSC. Processed samples are labeled and stored in the PIFSC Dry Archive room.

9c. Will the organisms be kept alive after collection? ☐ Yes ☒ No
Samples will be frozen immediately upon return to the research vessel after a day of operations and remain frozen until processing.

• General site/location for collections:
Four sites per island, one per cardinal direction (N, E, S, and W).

• 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?
No, each sample is placed into a separate container.

• Will organisms be released?
No

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

Samples are stored aboard the research vessel in individual sample containers within a scientific chest freezer.

11. Describe collaborative activities to share samples, reduce duplicative sampling, or duplicative research:
All data are made publicly available within one year of collection and archived with NCEI. CAUs and BMUs are deployed and analyzed in collaboration with NOAA Atlantic Oceanographic and Meterological Laboratory (AOML) and University of Miami in Miami, FL.

12a. List all specialized gear and materials to be used in this activity:
Small 4x4 inch PVC Plates (CAUs), small limestone pieces mounted on PVC (BMUs), Underwater Epoxy, DSLR cameras and housing for SfM

12b. List all Hazardous Materials you propose to take to and use within the Monument:
Very dilute Mercuric Chloride - HgCl2. Used for dissolved inorganic carbon water sampling and stored appropriately in double walled containers within Hazmat lockers.

13. Describe any fixed installations and instrumentation proposed to be set in the Monument:
For SfM surveys at fixed sites we will use existing pins where possible. If needed, we will install 1-2 stainless streel rods per site to establish the plot and facilitate future surveys to track change through time.

14. Provide a time line for sample analysis, data analysis, write-up and publication of information:
Sample analysis (instrument time series, CAUs, BMUs, water samples) is completed within 8 months of cruise termination, and data analysis and write-up are completed within 3 months thereafter. Data are publicly archived at NCEI within one year. Benthic cover data extracted from the SfM surveys will be provided within a year of collection. Methods for extracting coral demographic data from SfM surveys is still under development and may not be completed within a year.

15. List all Applicants' 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.

Signature Date

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

NOAA/Inouye Regional Center
NOS/ONMS/PMNM/Attn: Permit Coordinator
1845 Wasp Blvd, Building 176
Honolulu, HI 96818
FAX: (808) 455-3093

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

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):

Divers
Barkley, Hannah
Garriques, Joao
Halperin, Ariel
Morioka, James
Pomeroy, Noah
Reardon, Kerry
Wester, Tate
Winston, Morgan

Data manager
Akridge, Michael

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

See attached file with instrumentation sites (NWHI_OCCsites.csv)

3. Other permits (list and attach documentation of all other related Federal or State permits):

None

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.

NA

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

All funding comes from an annual budget of the United States Federal Government for the National Oceanic and Atmospheric Administration.

5. Time frame:
Activity start: 27 August 2019
Activity completion: 14 September 2019

Dates actively inside the Monument:
From: 27 August 2019
To: 14 September 2019

Describe any limiting factors in declaring specific dates of the proposed activity at the time of application:

The ship's schedule is subject to change due to weather delays and changes in project schedules.

Personnel schedule in the Monument:

See list above

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:

The U.S. Federal Government is self-insured.

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

X Vessel
☐Aircraft

Provide Vessel and Aircraft information:
NOAA Ship Rainier, IMO #6711003

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:

NA (we are working off NOAA ship and small boats)

Additional Information for Land Based Operations

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

12. Room and board requirements on island:

13. Work space needs:

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

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

May 24, 2019

TO: Division of Aquatic Resources File

THROUGH: Suzanne D. Case, Chairperson

FROM: Maria Carnevale
Papahānaumokuākea Marine National Monument

SUBJECT:
DECLARATION OF EXEMPTION FROM THE PREPARATION OF AN ENVIRONMENTAL ASSESSMENT UNDER THE AUTHORITY OF CHAPTER 343, HRS AND CHAPTER 11-200 HAR, FOR PAPAHĀNAUMOKUĀKEA MARINE NATIONAL MONUMENT RESEARCH PERMIT TO DR. RUSSELL E. BRAINARD, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, PACIFIC ISLANDS FISHERIES SCIENCE CENTER, FOR ACCESS TO STATE WATERS TO CONDUCT ACTIVITIES FOR THE PACIFIC REEF ASSESSMENT AND MONITORING PROGRAM UNDER PERMIT PMNM-2019-013.

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. Russell E. Brainard, National Oceanic and Atmospheric Administration, Pacific Islands Fisheries Science Center, for Access to State Waters to Conduct Activities for the Pacific Reef Assessment and Monitoring Program.

Permit Number: PMNM-2019-013

Project Description:

The activities covered under this permit would occur between August 20, 2019 and September 7, 2019.

The Applicant and the proposed reef assessment and monitoring activities are largely a renewal of work previously permitted and conducted in the Monument.

INTENDED ACTIVITIES

Dr. Russell Brainard (applicant) proposes to conduct reef assessment and monitoring activities within the Monument, as part of the Pacific Reef Assessment and Monitoring Program (RAMP) from 8/20/2019 - 9/7/2019 on a research cruise aboard NOAA Ship RAINIER (separate permit application underway). A total of 23 trained researchers would conduct activities from 0 - 30 m. depth at randomly selected sites at French Frigate Shoals, Lisianski Island, Pearl and Hermes Atoll, and Kure Atoll.

The primary research areas include 1) ocean and climate change; 2) benthic communities; 3) non- coral invertebrates; and 4) reef-associated fish communities. Specific proposed research activities within these four areas are listed below:

Ocean and Climate Change Monitoring

- Perform conductivity, temperature, and depth recorder (CTD) casts to gather depth profiles of temperature and salinity in shallow-water environments.
- Conduct water sampling efforts in conjunction with CTD casts at coral reef survey sites to quantify the carbonate system present
- Recover and replace instrumentation to assess and monitor changes in calcification and bioerosion rates measured within the reef community. This information will help assess the response of coral reef ecosystems to climate change and ocean acidification.
- Complete maintenance, replacement and installation of various oceanographic instrument arrays that have been long-term scientific features at permanent survey sites.
- Use photomosaics (Structure-for-Motion, 'SfM') to collect coral community composition data at the climate stations and contextualize any physical and/or biological changes recorded at the climate stations over time.
- Habitat characterization of the permanent sites.

Reef Fish Monitoring

- Gather data sufficient to assess status and trends of Pacific reef fish populations.
- Provide the basis for meaningful comparison of reef fish stocks across the PNMN.
- Provide the basis needed to assess the response (or potential response) of reef fish communities to possible ecosystem impacts such as fishing, ecotourism, pollution, habitat damage, sedimentation, and hurricanes.
- Conduct SfM surveys at each site to assess habitat complexity, coral demography and benthic cover.

The proposed activities directly benefit the Monument through 3.1.1 – Marine Conservation Science Action Plan (Strategy MCS-1: Continuing to enhance research, characterization and monitoring of marine ecosystems for the life of the plan, as appropriate, and Strategy MCS-2: Assess and prioritize research and monitoring activities over the life of the plan). These research activities are part of a long-term monitoring strategy to document and assess changes in the Monument's reef habitats and ocean chemistry over time.

The proposed activities are in direct support of the Monument Management Plan's (MMP) priority management needs through 3.1.1 – Marine Conservation Science Action Plan (Strategy MCS-1: Continuing to enhance research, characterization and monitoring of marine ecosystems for the life of the plan, as appropriate, and Strategy MCS-2: Assess and prioritize research and monitoring activities over the life of the plan). Strategy MCS-1 focuses on "continuing marine research, characterization, and monitoring designed to support an ecosystem-based approach to protection and management" and for the continuation of characterizing "types and spatial distributions of shallow-water marine habitats to inform protection and management efforts". Strategy MCS-2 calls specifically for integrating collaborative "independent monitoring initiatives...such as...water chemistry and water quality". Reef assessment and monitoring activities and associated long-term data sets such as those proposed fit into these two strategies of the MMP. Activities such as those to be carried out by the permittee, are also addressed in the Monument Management Plan Environmental Assessment (December 2008) which resulted in a FONSI.

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 Native Hawaiian Cultural Working Group. In addition, the permit application has been posted on the Monument Web site since March 20, 2019, 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 surveys and collections, 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. Since this permit involves an activity that is precedent to a later planned activity (i.e. the recovery of Subsurface Temperature Recorders (STRs), Calcification Accretion Units (CAUs), and Bioerosion Monitoring Units (BMUs)), the categorical exemption determination here will treat all planned activities as a single action.

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 exemption class has been interpreted to include fish collection for marine surveys and research, falling under Exemption Class #5, Exempt Item #15 which allows "aquatic life surveys, inventory studies, new transect lines, photographing, recording, sampling, collection, culture and captive propagation." It is also interpreted to include mapping activities under Exemption Class #5, Exempt Item #2 "Non-destructive data collection and inventory, including field, aerial and satellite surveying and mapping." (DEPARTMENT OF LAND & NATURAL RESOURCES, EXEMPTION LIST, published June 5, 2015).

As discussed below, no significant disturbance to any environmental resource is anticipated in the sampling 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.

The activities would be a continuation of work previously conducted by the Applicant, which involves accessing the Monument's shallow water coral reefs (≤30 m.) to conduct rapid ecological assessments. The Applicant has received permits to conduct similar work in 2008, 2010, and 2013, and is likely to request future permits to continue this work. This study involves reef assessment and monitoring activities, including oceanographic seawater sampling, benthic surveys, instrument installation/retrieval, removal of coral and non-coral invertebrates and sampling equipment, and the opportunistic collection of crown-of-thorns sea stars. Minimal impact to the benthos is expected. 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 would 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 RAINIER (permit application under review).

All other permits active during that time period and at those locations 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.

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.