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:
Papahānaumokuākea Marine National Monument Permit Coordinator
6600 Kalaniana'ole Hwy. # 300
Honolulu, HI 96825
nwhipermit@noaa.gov
PHONE: (808) 397-2660 FAX: (808) 397-2662

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

Papahānaumokuākea Marine National Monument
Permit Application Cover Sheet

This Permit Application Cover Sheet is intended to provide summary information and status to the public on permit applications for activities proposed to be conducted in the Papahānaumokuākea Marine National Monument. While a permit application has been received, it has not been fully reviewed nor approved by the Monument Management Board to date. The Monument permit process also ensures that all environmental reviews are conducted prior to the issuance of a Monument permit.

Summary Information

Applicant Name: Christopher Kelley
Affiliation: Hawaii Undersea Research Laboratory

Permit Category: Research
Proposed Activity Dates: October-December, 2008
Proposed Method of Entry (Vessel/Plane): Vessel, HURL ship Kaimikai-o-Kanaloa (KOK)
Proposed Locations: Deepwater habitat (>100 m) around Twin Banks and Nihoa

Estimated number of individuals (including Applicant) to be covered under this permit:
7
Estimated number of days in the Monument: 10

Description of proposed activities: (complete these sentences):

a.) The proposed activity would…
survey and obtain specimens from 2 deepwater ridges in the monument located northwest of Nihoa and south of West Twin Bank where corals and sponges are believed to exist in unusually high densities. The depth range of the activity will be 400-1800 m.

b.) To accomplish this activity we would ….
use the Hawaii Undersea Research Laboratory's ship (R/V Kaimikai-o-Kanaloa (KOK), one of the Pisces submersibles, the RCV-150 Remotely Operated Vehicle (ROV), and the KOK's Sea Beam Multibeam sonar mapping system. The Pisces IV or V will be deployed from the ship for a maximum of seven 8-hour dives between 600-1800 m. Four submersible dives will be used for visual/video surveys, two dives for collecting invertebrate specimens, primarily corals and sponges, and the seventh dive will be used for either surveys or specimen collecting depending on the outcome of the previous dives. The ROV will be deployed at night to conduct additional video surveys in the 400-900 m depth range. The Sea Beam system will be used to map the seafloor in the vicinity of the study sites as well as during transits in areas that have not been previously mapped.

c.) This activity would help the Monument by …
determining whether high density invertebrate communities exist on these two sites, which species are present in these communities, and what their relative abundances are. The Monument is funding this project for the purpose of identifying important deepwater resources within its boundaries. Deepwater corals and sponges are the priority animal groups for this project because recent research has found individual lifespans of several thousands of years in at least two species of corals. Deepwater sponges are also believed to be very long-lived however, determining their age is more difficult to accomplish. Both corals and sponges provide shelter and substrate for many other types of invertebrates (ophiuroids, crustaceans, echinoderms, etc) and in so doing function as keystone species for hard substrate deepwater communities. Furthermore, it is almost certain that these sites contain a large number of species presently unknown to science and/or Hawaiian waters. The location, extent, and composition these communities is therefore important information for the Monument's to acquire.

Other information or background: Similar to 2007, we would like to obtain a limited number of rock samples for the purpose of determining the age of these two ridges. The site south of Twin Banks was examined during the 2007 dives however we felt one additional survey dive and one specimen collecting dive would complete the dataset for this location. No submersible dives have ever been conducted on the second site northwest of Nihoa. Dr. Drazen is also planning on opportunistically conducting remote camera drops in the vicinity of these sites. This activity has been included in a separate permit application under his name and therefore the details are not included in this application.

Section A - Applicant Information

1. Applicant

Name (last, first, middle initial): Kelley, Christopher D

Title: Program Biologist

1a. Intended field Principal Investigator (See instructions for more information):
Same as above

2. Mailing address (street/P.O. box, city, state, country, zip): Hawaii Undersea Research Laboratory, University of Hawaii at Manoa,

Phone:

Fax:

Email:

For students, major professor's name, telephone and email address: Not Applicable

3. Affiliation (institution/agency/organization directly related to the proposed project):
Hawaii Undersea Research Laboratory/Department of Oceanography/University of Hawaii

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):
Christopher Kelley, Principal Investigator, HURL,
John Smith, co-Investigator, HURL,
Jeff Drazen, co-Investigator, University of Hawaii,
Les Watling, co-Investigator, University of Hawaii,
Rhian Waller, co-Investigator, University of Hawaii,
Jane Culp, observer/video specialist, HURL,
John Yeh, research assistant, University of Hawaii,

Section B: Project Information

5a. Project location(s):

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

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

Location Description:
The two study sites are located: 1) twenty-nine nautical miles WNW of Nihoa, and 2) seven nautical miles S of West Twin Bank. Both sites are deepwater ridges, which are expected to be composed of manganese coated basalt below 1000 m and and manganese coated basalt and/or carbonate above 1000 m. At each site, 3-4 kilometer long submersible surveys will be conducted from deeper to shallower depths (i.e., approximately 1700 m to 800 m at site 1 and 1600-1100 m at site 2). Collecting dives will be conducted at each site where dense coral communities are found during the surveys. HURL's ROV will be deployed in shallower depths (400-900 m) at each site. Finally, multibeam mapping will be conducted in the vicinity of each site, as well as during transits between sites, depending on weather and time constraints.

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 purpose of this project is to survey and sample two sites, one off Twin Banks and the other off Nihoa, as part of our ongoing efforts to identify important sites of deepwater resources for the Monument. Both sites are deepwater ridges where current velocities are expected to be topographically accelerated thereby providing conditions that may favor development of extensive communities of corals and sponges. At site 1, three survey dives will be conducted during which observers will identify and count every fish and invertebrate seen within the submersible light field which has an approximate width of 20 m. Sponge samples may be collected on these dives as well as any particularly unusual animal encountered. Once these are completed, an additional dive will be conducted on this site to obtain other deepwater invertebrate specimens, particularly corals. In 2007, deepwater corals accounted for over 90% of the transect counts but were the most problematic group to visually identify to species. As with that previous study, samples in this project will be obtained for both taxonomic and genetic analysis. Scleractinian specimens will be analyzed for inclusion of a larger study by one of us (Waller) on gene flow between the Monument and other parts of the Pacific and Atlantic Oceans. These specimens will also be examined histologically for their reproductive states. At site 2, one survey dive and one collecting dive will be conducted using the same protocol as above. This is one of the same dive sites as last year and the two dives this year are designed to complete the dataset for this site and collect specimens to confirm visual identifications as well as for the other purposes mentioned above. A final seventh dive is being reserved for either surveying or specimen collecting at either site and is essentially a backup for either adverse weather conditions or possible vehicle problems on any of the other dives. ROV dives are being used to extend the upward depth range of the video surveys. The multibeam mapping data will be obtained primarily to add to the overall growing multibeam dataset for the Monument and to make the most efficient use of shiptime.

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?
Survey dives (submersible and ROV) will involve counts and identifications by trained observers supported by video and still imagery. No collecting will be conducted during any ROV survey dive. If a particularly unusual invertebrate is encountered on a submersible survey dive, there may be an effort to obtain a specimen since it will likely be a new species or new record for Hawaiian waters. However, the majority of specimens for this project will be obtained on dedicated submersible collecting dives, during which 2 deepwater coral experts will be present. Specimens will be selectively collected for species identification, with the number being only as many required for publishing species descriptions. These dives will be conducted where the survey dives find large numbers of corals and sponges and therefore should have a minimum impact on the overall communities.

b. How will the activity be conducted in a manner compatible with the management direction of this proclamation, considering the extent to which the conduct of the activity may diminish or enhance Monument cultural, natural and historic resources, qualities, and ecological integrity, any indirect, secondary, or cumulative effects of the activity, and the duration of such effects?
The submersible ballast shot will be the only manmade material left on these sites. The pilot's standard protocol on any dive is to find a clear area of substrate where the shot can be released. This material will be in the form of a small pile of tiny metal discs that readily corrode in seawater. The pilot's standard landing protocol is also to hover above the bottom first in order to locate a clear area of substrate to land the vehicle. The researchers and pilots involved in this project will take every possible precaution to minimize any disturbance their activities might have on these communities.

c. Is there a practicable alternative to conducting the activity within the Monument? If not, explain why your activities must be conducted in the Monument.
The purpose of the work is to locate and provide information on deepwater resource sites to managers of the Monument who are funding this investigation. The only other way to obtain information on these resources would be by dredging (rock samples) and bottom trawling (biological samples) both of which would have greater impact than the proposed transecting and selective sampling by submersible. Conducting this activity outside the monument would be interesting for comparative reasons, but have no relevance to the management and preservation of these types of resource sites inside 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?
The majority of the seafloor enclosed in the Monument is in deep water. Identifying sites where deepwater resources, such corals and sponges, are particularly abundant is vital to the future management of the Monument. Many if not all of the coral and sponge communities within the Monument likely have colonies hundreds to thousands of years old. Including coral genetic and reproductive analyses will increase our understanding of how populations both within and outside the monument are connected; knowledge which is essential to their maintenance. Furthermore, some of the members of these communities are undoubtedly unknown to science at the present time and may be endemic to the Hawaiian Islands further justifying the protection they are accorded by the existence of the Monument. The information obtained from this project may lead to consideration of designating one or more of these sites as special preservation areas or ecological reserves if appropriate. Finally, this activity, which involves visual and video transects by submersible coupled with selective sampling, will have little impact on the resources, qualities and ecological integrity of the Monument.

e. Explain how the duration of the activity is no longer than necessary to achieve its stated purpose.
A maximum of seven submersible dives will be conducted on the two sites (2-3 on one site and 4-5 on the other). Each dive is 8 hours long of which two hours is required for the descend and ascent. Therefore the submersible will only be on these habitats for a maximum of 6 hours per dive for a total of 42 hours. Individuals authorized to conduct activities under this permit will

therefore be at each location for a very short time. Given the costs of shiptime and the required transits between sites, ROV and mapping activities will likewise be no longer than necessary.

f. Provide information demonstrating that you are qualified to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.
The applicant is the program biologist for the Hawaii Undersea Research Laboratory (HURL) and is trained in the identification of deepwater fish and invertebrates. He has been both a lead and co-investigator on previous cruises involving submersible dives in the NWHI both before and after it was designated as a monument. He is very familiar with submersible/ROV visual and video transect methods and has been a principal investigator on at least 1 multibeam mapping cruise per year in the MHI for the past 5 years. He is therefore familiar with all of the technology that will be used to complete this activity. Other participants include Dr. John Smith who is a trained geologist, multibeam sonar specialist, and trained ROV pilot, Dr. Jeff Drazen who is an expert in deepwater fish ecology and physiology, John Yeh who recently completed his masters degree under Dr. Drazen on deepwater scavenging communities in Hawaii, Drs. Les Watling and Rhian Waller who are both well known and respected deepwater coral taxonomists and ecologists, and Ms. Jane Culp who is the video specialist at HURL responsible for logging animals and substrate types recorded on submersible dive videotapes. She has assisted the applicant on previous submersible projects and is therefore also trained in deepwater animal identification and submersible transect techniques.

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.
Funding for the activity is being provided by the Monument. To minimize transit costs, the activity was bundled into a single cruise with one other deepwater project that will be conducted off the island of Niihau. In order to maximize the number of dives the funding could provide, post-dive data processing will be carried out by the applicant and his team at no charge to the Monument. HURL is a NOAA National Undersea Research Center imbedded into the University of Hawaii. The study sites are located well off-shore in deepwater and therefore the risk of the ship running aground is minimal. The submersible ballast drops, which are less than 1 ft3 in volume are not expected to require mitigation. To the applicant's knowledge, previous ballast drops have not been encountered during repeat dives to the same site. This is due either to their very small footprint or to the fact that they are routinely carried out over sediment areas and may become rapidly buried.

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.
The goals of the multiyear project are to determine if the Monument's deep seamounts and volcanic ridges are sites of unusually dense beds of corals, sponges, and other animals that managers need to know about. Visual and video transects coupled with selective sampling are the primary means by which the applicant plans to make that determination for each suspected site. One of us (Watling) believes that there are more than 100 species of deep water gorgonian corals alone in the Monument, many of which will be new to science. Specimens will be collected to confirm visual identifications, publish species descriptions of animals that are known

but have not been previously described, and document possible new species. A small number of rock samples will be collected because not all of the seamounts and ridges in the Monument may have originated the same way. Multibeam mapping is crucial for managers to be able to understand the distribution of resources in the Monument and to understand exactly how much habitat is protected within the 50 mile boundaries. None of the methodology used in this activity will have a significant impact on the resources and ecological integrity.

i. Has your vessel has been outfitted with a mobile transceiver unit approved by OLE and complies with the requirements of Presidential Proclamation 8031?
It is the applicant's understanding that the KOK will be fitted with VMS prior to its departure from Honolulu.

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

8. Procedures/Methods:
A total of seven 8-hr submersible dives (4 surveys, 2 collecting, and 1 either survey or collecting) and seven 1-4 hour ROV dive nights are planned for this project. During each submersible survey dive (three on site 1 and one on site 2), two observers will identify and count every fish and invertebrate seen within the submersible's 20 m wide light field over the course of a 3-4 kilometer upslope transect. Data from each observer will be recorded on independent digital audio recorders. In addition, two video cameras, one with a depth and time overlay, will record both video and audio during the transects. Sponge samples may be collected on these dives as well as any particularly unusual animal encountered if time permits. The dedicated collecting dives, one on each site, will take place after the survey dives are completed. These dives will target the areas where the highest densities of corals were observed during the survey dives and will focus on obtaining voucher specimens, unidentifiable colonies that could be new species, and specimens of known but undescribed species for naming and publication purposes. The submersible's two manipulators will be used to collect smaller colonies in their entirety or remove branches of approximately 20 cm in length from larger colonies. Specimens of other invertebrates living on the corals (i.e., ophiuroids, crinoids, crabs, etc) will likely be collected at the same time and will be processed, preserved, and provided to appropriate specialists. A final seventh dive is being reserved as a backup for either surveying or specimen collecting at either site. ROV dives will be used to extend the upward depth range of the video surveys obtained from the submersible. The multibeam mapping data will be obtained primarily to add to the overall growing multibeam dataset for the Monument and to make the most efficient use of shiptime.

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:
Undetermined but focus will be on corals and sponges with commensal brittlestars, sea lilies, sea stars, crabs, and other invertebrates.

Scientific name:
undetermined cnidarians, poriferans, echinoderms, crustaceans, and other invertebrates

& size of specimens:
Maximum of 5 specimens of undetermined size of each species of coral and sponge. Larger colonies will be subsampled while smaller colonies, along with other invertebrates will be collected in their entirety. An undetermined number of other invertebrates associated with the corals and sponges will also be collected.

Collection location:
West Twin Bank and Northwest of Nihoa

☒ Whole Organism ☒ Partial Organism

9b. What will be done with the specimens after the project has ended?
Specimens will be collected by, or donated to, appropriate specialists for examination and proper curation. Scleractinian specimens will be processed fro histology, TEM, and molecular genetics in the Waller lab.

9c. Will the organisms be kept alive after collection? ☐ Yes ☒ No
Not Applicable

• General site/location for collections:

• Is it an open or closed system? ☐ Open ☐ Closed

• Is there an outfall? ☐ Yes ☐ No

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

• Will organisms be released?

10. If applicable, how will the collected samples or specimens be transported out of the Monument?
The specimens will be frozen to -80 C in an ultracold freezer, and/or preserved in either formalin or alcohol, and transported out on our research ship KOK.

11. Describe collaborative activities to share samples, reduce duplicative sampling, or duplicative research:
Specimens will be collected by (Watling and Waller), or sent to, appropriate specialists. No other deepwater projects are taking place in the Monument to our knowledge. The PI has been a participant on previous deepwater research projects and is aware of what specimens have been collected to date. Therefore research and sampling should not be duplicative.

12a. List all specialized gear and materials to be used in this activity:
Pisces IV or V submersible with video and data systems, attached manipulator arms, and boxes/baskets for specimen collection.
RCV-150 ROV for video transecting only.
Preservatives for collected specimens (formalin and alcohol).
Zip lock bags and other containers for specimen storage.
Other typical ship laboratory equipment such as microscopes, ultracold freezer, camera and stand for photodocumentation.

12b. List all Hazardous Materials you propose to take to and use within the Monument:
Formalin will be stored and used in the ship wet lab.
Alcohol (70% ETOH) will be stored and used in the ship wet lab.

13. Describe any fixed installations and instrumentation proposed to be set in the Monument:
Not Applicable

14. Provide a time line for sample analysis, data analysis, write-up and publication of information:
Specimen examination and preparation of new species descriptions will depend on the specialist. Genetic and reproductive analysis on scleractinian specimens will be completed in 1 year. Data extraction and entry from the 2007 cruise took approximately 4 months and the same amount of time is anticipated for this project. Data analysis, write-up, and publication should take no more than 8 additional months.

15. List all Applicants' publications directly related to the proposed project:
These are related by methodology or previous work in the Monument and are organized by date:

1) Watling, L. in press. A review of the genus Iridogorgia (Octocorallia: Chrysogorgiidae) and its relatives, chiefly from the North Atlantic Ocean. Journal of the Marine Biological Association of the United Kingdom.

2) Kahng, S. & C. Kelley. 2007. Vertical zonation of habitat forming benthic species on a deep photosynthetic reef (50-140 m) in the Au'au Channel, Hawaii. Coral Reefs. 26(3):679-687.

3) Waller, RG & Baco-Taylor, A (2007) Reproductive morphology of three Hawaiian deep-water precious corals. Bulletin of Marine Science, 81(3): 533-542.2)

4) Kelley, C.; R. Moffitt; & J.R. Smith. 2006. Mega-to micro-scale classification and description of bottomfish essential fish habitat on four banks in the Northwestern Hawaiian Islands. Atoll Research Bulletin. No. 543, 319-332.

5) Kelley, C. & W. Ikehara. 2006. The impacts of bottomfishing on Raita and West St. Rogatien Banks in the Northwestern Hawaiian Islands. Atoll Research Bulletin. No. 543, 305-318.

6) Miller, J.E., S. Vogt, R. Hoeke, S. Ferguson, B. Appelgate, J.R. Smith, and M. Parke. 2006. Bathymetric Atlas and Website for the Northwestern Hawaiian Islands, Atoll Research Bulletin, 543, p. 409-422.

7) Waller, RG. (2005) Deep Water Scleractinians: Current knowledge of reproductive processes. In: Freiwald A & Roberts JM (eds) Cold-water Corals and Ecosystems. Springer, Heidelberg, 691-700

8) Drazen, J. C., T. W. Buckley, and G. R. Hoff. 2001. The feeding habits of slope dwelling macrourid fishes in the eastern North Pacific. Deep Sea Res. I 48: 909-935.

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:

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

DID YOU INCLUDE THESE?

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