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: Matthew Thomas Craig
Affiliation: Hawaii Institute of Marine Biology

Permit Category: Research
Proposed Activity Dates: 6/2009, 8/2009
Proposed Method of Entry (Vessel/Plane): Vessel (Hi'ialakai)
Proposed Locations: Various-to be determined by cruise schedule

Estimated number of individuals (including Applicant) to be covered under this permit:
~ 4 (to be determined by berthing and cruise schedule)
Estimated number of days in the Monument: ~60 (TBD by cruise schedule)

Description of proposed activities: (complete these sentences):

a.) The proposed activity would…

Collect two species of reef fishes to compile life history data (age, growth, reproduction) that is currently unknown.

b.) To accomplish this activity we would ….

Collect fishes from reefs within the monument and return them to the laboratory for analysis

c.) This activity would help the Monument by …

Providing data that are directly relevant to management activities for three species of fishes important to Hawaii's coastal fisheries, and demonstrate probable differences in life history characters in organisms residing in protected and unprotected areas

Other information or background:

Section A - Applicant Information

1. Applicant

Name (last, first, middle initial): Craig, Matthew T.

Title: Post-doctoral Research Fellow

1a. Intended field Principal Investigator (See instructions for more information):
To Be Determined - Senior personnel will be appointed upon finalization of cruise schedule and berth assignments. Likely candidates are: Brian Bowen, Matthew Craig, Erik Franklin, Randy Kosaki, Carl Meyer.

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

[redacted]

Fax: [redacted]

Email: [redacted]

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

3. Affiliation (institution/agency/organization directly related to the proposed project):
Hawaii Institute of Marine Biology

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):
To Be Determined upon finalization of cruise schedule and berth assignments

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:

Location**	Longitude	Latitude
Kure Atoll	178.19706492000	28.55825235580
	178.19623585400	28.29958375730
	178.45987884800	28.29958375730
	178.46070791400	28.55742328970
Midway Atoll	177.19638223300	28.37419969920
	177.19721129900	28.13377055310
	177.52800864100	28.13459961920
	177.52800864100	28.37419969920
P& H Atoll	176.08850981800	28.04643025580
	175.63289162600	28.04539944540
	175.63289162600	27.70729363750
	176.08954062900	27.70626282710
Maro		
	189.163168767509, 25.6896206996621	
	189.163168767509, 25.2507640984811	
	189.695813271361, 25.2507640984811	
	189.695813271361, 25.6896206996621	
Necker		
	195.174692176864, 23.6785193745272	
	195.608149908867, 23.4949899389458	
	195.608149908867, 23.6785193745272	
	195.174692176864, 23.4949899389458	

Lisianski	173.67292570900	26.25150771120
	173.67292570900	25.83942708400
	174.23095155800	25.83942708400
	174.23095155800	26.25150771120
Laysan	171.47900122300	25.96027179830
	171.47725234300	25.65596666490
	171.97918092500	25.65771554490
	171.97918092500	25.96202067840
Gardner Pin.	167.74832319300	25.26070709440
	167.75087047400	24.34878019150
	168.36221811900	24.35132747340
	168.36476540100	25.26070709440
FFS	165.93465851400	23.94630965900
	165.93465851400	23.56421738120
	166.45685129400	23.56421738120
	166.45685129400	23.94630965900
Nihoa Island	161.66031956700	23.23816530420
	161.66286684900	22.94013332760
	162.05005369100	22.94268060940
	162.05260097200	23.23561802240

**Note that exact locations will be unknown until cruise schedule for the NOAA Ship Hi'ialakai is finalized. Exact sites at each location are chosen based on weather and sea state conditions and cannot be explicitly identified prior to cruise. The GPS coordinates given approximate a rectangle surrounding each island/atoll at the 100fa contour (in decimal degrees, projection geographic, datum WGS84).

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 primary goal of this research is to compile life history data for a suite of reef fishes within the Northwestern Hawaiian Islands Marine National Monument (the Monument). We aim to determine 1) the relationship between age and growth, 2) the age/size at first sexual maturity, and 3) the relationships among morphological measurements commonly used in fisheries science (e.g., standard length to total length, length to weight). We propose to examine two reef species that have been identified as important to both the ecology of Hawaii's coral reefs and to the fishing preference of many residents of the state of Hawaii ('āweoweo, Priacanthus meeki, and 'ū'ū, Myripristis berndti). These species represent two commonly taken reef species in Hawaii, and represent the meso-carnivorous trophic level that is not well represented by other sampling in within the monument. Additionally, these species are currently under study by M. Craig and E. Franklin through support from Hawaii DAR in the main Hawaiian Islands. A major "value added" component to this research is that we are also performing this same research on species already being sampled for genetic analysis by B. Bowen and colleagues. This synergistic approach will allow for maximal use of specimens that unavoidably must be sacrificed, and will provide a contribution to a growing database on reef fish life history in the state of Hawaii.

These data are critical to effectively manage fisheries. Determining the age structure of populations is a necessary first step in 1) setting appropriate size limits for fisheries species, 2) more fully understanding the impacts of fishing pressure, and 3) developing conservation priorities to ensure the persistence of vulnerable reef species. When correlated with an estimate of age of first maturity (and by extrapolation first reproductive effort) these data become increasingly important.

In addition to the characterization of the population parameters within the Monument, our data will be critical in a comparative study of impacted versus non-impacted populations of reef fishes. The Monument provides an unprecedented setting to test the effects of human impacts on life history parameters and population structure of these characters. Through a collaborative effort with researchers at various agencies within the state of Hawaii, we aim to compare our data with similar data from the main Hawaiian Islands. This will lead to an explicit understanding of the impact that fishing pressure has on the age structure, maximum size, and relative timing of reproduction for Hawaiian reef fishes.

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?

The proposed research procedures will be conducted with adequate safeguards toward the resources and ecological integrity of the Monument. Prior to the research cruise, project team members will be educated on cultural issues relevant to the Papahanaumokuakea Marine National Monument to gain an understanding of the importance of the unique marine communities that they will be privileged to work in during the trip. Research divers on the

project team will also possess adequate collections experience and taxonomic identification skills to efficiently perform activities while minimizing their impact to the marine environment. In addition, the research team will review and adhere to regulatory guidelines and function with professionalism in pursuit of the research objectives.

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 Monument provides an unprecedented setting to test the effects of human impacts on life history parameters of reef fishes. The unique positioning of the world's largest marine protected area immediately adjacent to one of the most impacted coral reef ecosystems in the United States provides an opportunity to assess impacts on many communities without inherent biases due to geographical separation. The Monument therefore is an essential area to sample in order to make robust, scientifically based conclusions regarding the impact fisheries may have on the age structure and reproductive effort of many reef fish species.

This research will be conducted in a manner compatible with the management direction of the Monument and will considerably enhance Monument resources and ecological integrity. The development of management strategies that take into consideration age structure of populations and correlate those with age a first maturity will elucidate the degree to which fishing pressure in impacted areas influences these population parameters. This can be communicated in terms of potential reproductive output lost from harvesting individuals before they reach a reproductive age. Understanding the potential reproductive output along with a measure of baseline population age structure will allow resource managers to gauge the value of the resources within the Monument boundaries by combining our data with population abundance and size frequency data generated by programs such as RAMP.

While this research does require sacrificing a limited number of individuals, it should be noted that these individuals will also be used in a synergistic manner with other research projects. Most of the species of interest are also being used for genetic analysis by B. Bowen and colleagues, and the specimens will be available for any other ongoing studies that can utilize the material, thus we are maximizing the use of each and every individual that is sacrificed within the reserve. Therefore, the benefits of this research are maximized and greatly outweigh the costs of the extremely limited harvest..

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 basis of our sampling design is to understand how 1) impacted communities may respond differentially to non-impacted communities and 2) how organisms respond to gradients of ecological factors such as temperature. The former is directly relevant to management issues; if impacted communities show altered life history traits, conservation efforts (e.g., regulations) must be set with this in mind. The latter has direct relevance to the management of the monument as well as theoretical implications; where should new protected be set so as to encompass a set of conditions (ecological or otherwise) that maximize ecosystem health.

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 impact of the removal of a limited number of specimens from the monument will have less impact than a typical take by a weekend fisherman.

e. Explain how the duration of the activity is no longer than necessary to achieve its stated purpose.
The duration of this activity is determined by the schedule of the NOAA Ship Hi'ialakai.

f. Provide information demonstrating that you are qualified to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.
Dr. Craig has a Ph.D. in marine biology and has been conducting marine field research since 1995. Dr. Craig has numerous, peer reviewed publications covering a wide array of research topics including fish life history. Dr. Craig has also conducted research within the monument on several occasions since 2005. (See attached CV for more details).

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.
This activity is financially supported by the Papahanamokuakea Marine National Monument/Hawaii Institute of Marine Biology partnership

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.
Our methods are preferable in that they allow for directed sampling of individuals, rather than other methods which are non-discrete. We are therefore able to specifically target exactly the species and size range of fishes to fully compliment existing data

i. Has your vessel has been outfitted with a mobile transceiver unit approved by OLE and complies with the requirements of Presidential Proclamation 8031?
See NOAA Ship Hi'ialakai records.

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

8. Procedures/Methods:

Field Collections: In the field, our collections will rely on the same methods proposed by Bowen and colleagues for the reef fish genetics sampling. Briefly, SCUBA divers equipped with spear poles will target species along the reef. A “blue water” rule will be enacted meaning that if one cannot see water behind the target specimen no shot will be taken. This greatly reduces accidental reef strikes. Specimens will be returned to the ship for processing.

Data acquisition: Aboard the NOAA ship Hi’ialakai, samples will be processed according the following procedure. All specimens will immediately be sampled for genetic

analysis according to the protocols of B. Bowen and colleagues (briefly, a fin clip will be taken and preserved in DMSO/NaCl buffer). Most specimens will then be bagged, labeled, and frozen for laboratory analysis. For a subset of the species, gonads will be removed aboard the ship, weighed to the nearest gram, and preserved in a 10% buffered formalin solution for use in histological examination of their microstructure. Individuals will then be labeled, bagged, frozen and returned to the lab for further processing.

In the laboratory, specimens will be measured to nearest millimeter (both total and standard length), weighed to the nearest gram, and sagittal otoliths will be removed following the methods of Craig et al. (Bull. Mar. Sci. 65[3],1999). Otoliths will be stored dry for later use. Gonads will be visually sexed and if in suitable condition will be removed and preserved in 10% formalin for later use in histological preparations. Additional soft part (e.g., liver, heart, muscle) will be dissected and stored as necessary to be used in any other relevant studies, including ciguatera studies, lipid analysis, and stable isotope analsysis by researchers throughout the state.

Following removal, otoliths will either be mounted on wooden blocks using cyanoacrylate adhesive and sectioned using a Buuhler-Isomet low speed, double-diamond bladed saw or embedded in resin and ground with 100grit sand paper. These methods allow for the visualization of annuli which give a direct measure of the individual's age.

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:
'Āweoweo, 'ū'ū

Scientific name:
Priacanthus meeki, Myripristis berndti

& size of specimens:
25 of each species from each collecting locality; various sizes

Collection location:
Various, see above.

☒ Whole Organism ☐ Partial Organism

9b. What will be done with the specimens after the project has ended?
Following removal and archival of necessary structures, specimens will be discarded

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

• General site/location for collections:
N/A.

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

• Is there an outfall? ☐ Yes ☐ No
N/A

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

• Will organisms be released?
N/A

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

11. Describe collaborative activities to share samples, reduce duplicative sampling, or duplicative research:
Our sampling will include taking a fin clip for genetic analysis conducted by B. Bowen and colleagues. Additionally, our life history work is in direct collaboration with Hawaii DAR who has support a Local Action Strategy to develop a robust set of life history characters to aid in management of these important resources

12a. List all specialized gear and materials to be used in this activity:
N/A

12b. List all Hazardous Materials you propose to take to and use within the Monument:
Formalin

13. Describe any fixed installations and instrumentation proposed to be set in the Monument:
N/A

14. Provide a time line for sample analysis, data analysis, write-up and publication of information:
This project is ongoing. Initial data aquisition will commence immediately upon return of vessel. Planned dissemination of preliminary information is 112/2009

15. List all Applicants' publications directly related to the proposed project:
(5 of 30)

Craig, M. T. 2007. Preliminary observations on the life history of the white-streaked grouper, Epinephelus ongus (Serranidae), from Okinawa, Japan. Ichthyological Research 54(1):81-84.

Craig, M. T., and D. J. Pondella, II. 2006. A survey of the fishes of the Cabrillo National Monument, San Diego, California. California Fish and Game. 92(4):172-183.

Craig, M. T., F. J. Fodrie, and P. A. Hastings. 2003. The nearshore fish assemblage of the Scripps Coastal Reserve. Coastal Management 32:341-351.

Craig, M. T., D. J. Pondella, II, and J. C. Hafner, 1999. Analysis of Age and Growth in two Eastern Pacific Groupers (Serranidae: Epinephelinae). Bulletin of Marine Science 65(3):807-814.

Erik C. Franklin, C. V. Brong, A. R. Dow, and M. T. Craig. 2008. Length-weight and length-length relationships of three endemic butterflyfish species (Chaetodontidae) from coral reefs of the Northwestern Hawaiian Islands, USA. In Press. Journal of Applied Ichthyology.

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