

State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Aquatic Resources
Honolulu, Hawaii 96813

June 13, 2008

Board of Land
and Natural Resources
Honolulu, Hawaii

Re-submission of Deferred 2007 Request for Authorization and Approval to Issue a
Papahānaumokuākea Marine National Monument Research Permit to Dr. Greta Aeby, University
of Hawai'i, Hawai'i Institute of Marine Biology (HIMB), for Access to State Waters to Conduct
Coral and Fish Disease Research Activities.

The Division of Aquatic Resources (DAR) hereby submits a request to revisit a submittal that was brought before the Board and deferred on July 13, 2007. At that time, the applicant was under investigation for possible permit violations, and as such, DAR was unable to provide a recommendation for the request for a 2007 Papahānaumokuākea Marine National Monument Research Permit. As the applicant has since been found to have been in violation of her 2006 State permit, DAR now recommends that the 2007 request for a permit be denied. Please refer to the accompanying original Land Board submittal, F-4a.

Respectfully submitted,



DAN POLHEMUS
Administrator

APPROVED FOR SUBMITTAL



LAURA H. THIELEN
Chairperson

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

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Board of Land
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Request for Authorization and Approval to Issue a Papahānaumokuākea Marine National Monument Research Permit to Dr. Greta Aeby, University of Hawai'i, Hawai'i Institute of Marine Biology (HIMB), for Access to State Waters to Conduct Coral and Fish Disease Research Activities.

The Division of Aquatic Resources (DAR) hereby submits a request for your authorization and approval for issuance of a Papahānaumokuākea Marine National Monument (PMNM) research permit to Dr. Greta Aeby, HIMB, pursuant to § 13-60.5, *Hawaii Administrative Rules*, and § 187A-6, *Hawaii Revised Statutes*, and all other applicable laws and regulations. The research permit, described below, will allow activity to occur in the NWHI State Marine Refuge (0-3 miles) waters surrounding Nihoa Island, French Frigate Shoals, Gardner Pinnacles, Laysan Island, Lisianski Island, Pearl and Hermes Atoll, and Kure Atoll. The activities will occur from August 13, 2007 through September 30, 2007, as outlined below and in the attached permit application.

INTENDED ACTIVITIES

The applicant proposes to measure changes in coral disease levels through time, measure rates of tissue loss from different diseases, determine patterns of disease transmission among colonies, and measure the rate of spread of disease and evaluate changes in coral cover and coral species composition.

Objectives:

- 1) To re-survey permanent sites at FFS, Pearl and Hermes, Midway and Kure established in 2005 for the assessment of disease dynamics.
- 2) To survey additional *Acropora* rich sites within FFS.
- 3) Determine the etiology of *Acropora* wasting syndrome (AWS).
- 4) Determine whether AWS is infectious .
- 5) Determine the affect of *Acropora* growth anomalies on the growth of table corals.
- 6) Examine ta'ape (*Lutjanus kasmira*) and native goatfishes (*Mulloidichthys flavolineatus*, *Parupeneus multifasciatus*, *P. porphyreus*) for presence of disease.
- 7) Examine the surgeonfish, *Ctenochaetus strigosa*, affected by pigmentation disease.

PROCEDURES

Disease Studies

Re-survey of established sites at FFS, Pearl and Hermes (PHR), Midway (MID) and Kure (KUR) will follow established protocol. Two 25 m lines will be laid out along the substrate. A diver will then swim over the lines during which all corals within one half meter of either side of the transect lines will be identified to species, counted, and assigned to a size class. In the same manner, a second diver will swim over the lines and examine all corals for signs of bleaching or disease. Bleached colonies will be assigned a bleaching category: 0-no bleaching; 1- 10-30%; 2- 30-50%; 3-50-100%; 4-50-100%; 5-mortality. For corals exhibiting disease, a general description of the condition will be recorded, the coral will be photographed and a specimen will be collected for histopathological examination.

Growth Studies

Colonies of *Acropora cytherea* with growth anomalies and a nearest neighbor of similar size will be measured (length and width of each tier), photographed (with a ruler) and tagged. They will be re-examined the following year (2008) to look for differences in growth between affected and control colonies. The applicant will be tagging colonies located at their established permanent sites at FFS.

Disease Etiology

Note – Dr. Aeby has withdrawn her request to transport frozen live cultures of healthy and diseased coral to O‘ahu.

Small fragments of infected coral and healthy fragments for control will be collected at depth and placed into individual bags. Samples will be held on ice and transported to the ship where they will be processed. To determine whether the disease is infectious, a subsample of the fragments will first be used for transmission studies. An infected fragment and a control fragment will be held together in a bucket of seawater for 24-48 hours. The buckets will have tight fitting lids with a small hole for an air line and will be placed in tubs of fresh water providing secondary containment. The tubs will be secured in a protected area on deck. After a maximum of 2 days, the coral fragments will be examined, photographed and processed crushing with a sterile mortar and pestle and mixing with 10ml of sterile seawater. The mixture will be placed in sterile tubes in 15% glycerol stock solution and frozen at -80C. This procedure results in frozen microflora which will be re-cultured back on O‘ahu to conduct infection trials at a secure PC2 facility. Any seawater or equipment exposed to infected coral will be sterilized with 10% bleach solution which is a standard sterilization technique used in pathogen studies. To ensure that the transmission study is completed before leaving FFS, the study will be initiated immediately upon arrival at FFS. In addition, the chief scientist will be notified

of the start and end of all trials so that can be taken into account if cruise schedules need to be adjusted.

Non-lethal Environmental Screening

To investigate the potential use of non-lethal environmental screening, the applicant proposes to collect seawater and sediment adjacent to infected colonies and swab or syringe the mucus from infected and healthy colonies. Samples will be collected in the field, held on ice and transported to the ship where they will be frozen for later molecular analysis. At HIMB, DNA will be extracted, amplified and microorganisms identified.

Fish Disease Screening

Target species of fish will be collected by spear, placed on ice and transported to the ship for examination. Fish will be weighed and measured (standard and fork length), examined systematically externally and internally, and gross lesions documented. For histopathology, sections of skeletal muscle, skin, spleen, liver, cranial and caudal kidneys, swim bladder, brain, heart, gill, and gonad, small intestines, and stomach will be excised and fixed in 10% neutral buffered formalin. Tissues will be sectioned, dehydrated in alcohol series, embedded in paraffin, sectioned at 5 μ m, placed on microscope slides, stained with hematoxylin and eosin, and examined using a microscope.

REVIEW PROCESS:

The permit application was sent out for review and comment to the following scientific entities: Division of Aquatic Resources staff, Papahānaumokuākea Marine National Monument, NOAA Pacific Islands Regional Office (NOAA-PIRO), and United States Fish and Wildlife Service. The Office of Hawaiian Affairs (OHA), and the Kahoolawe Island Reserve Commission (KIRC) were also consulted.

Comments received from the scientific community are summarized as follows:

1. If Hawaiian Monk Seals are in the area while performing any transect, camera drop, SCUBA operations, fishing activity, or sampling activity, the activity shall cease until the animal(s) depart the area.
2. The applicant and those listed on the permit shall view and be familiar with "marine Wildlife Viewing Guidelines" available at <http://www.nmfs.noaa.gov/pr/education/viewing.htm>
3. Applicants abide by new Disease Protocols.
4. Is any provision made for preventing possible contamination of healthy corals by implements (e.g. chisels) used to sample diseases corals? (Note – this was received from a reviewer unfamiliar with the Disease and Transport Protocols).

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

1. OHA requests that the research vessel have at least one cultural practitioner on board.
2. OHA urges the State to find all applications incomplete (and therefore will not be processed) if they do not include a reference to cultural research, consultation, and resulting protocol.
3. One reviewer requested that once a coral specimen is no longer required, that it be transferred to a Native Hawaiian Organization for a culturally appropriate method of disposal.

RESPONSE:

A meeting was held between HIMB researchers and administrators, and DAR staff, to discuss reviewer's (Scientific, Policy, and Cultural) concerns. The concerns raised by OHA were also discussed at the meeting. All applicants agreed to abide by the three comments received from the scientific community. Scientific comment number four (4) is addressed in Final Staff Recommendation four (4) below.

Additionally, it was the consensus of those in attendance, that in order to address the requests from OHA, more information is required from OHA. Specifically, a list of acknowledged cultural practitioners who are available to accompany specific research cruises should be provided by OHA; additionally, a briefing for science researchers should be arranged by OHA or a designate, to provide the information needed by individual applicants in order to address OHA's request for cultural impact analysis.

IMPACT ANALYSIS

Although some disturbances to Monument resources may be necessary to achieve the objective of this project, this research should have minimal impact on Monument resources. The effective management of marine protected areas requires detailed information regarding disease among various populations of species. This information is needed by the Co-Trustees to effectively manage the resources of the Monument. Therefore this study is important in defining the relevant units of management for the Monument and to assess the degree to which coral disease and is present and rate at which it may spread in the Monument. Therefore, the value of this research far outweighs the minimal effects of the research activities.

FINAL STAFF RECOMMENDATIONS:

DAR staff is of the opinion that the Applicant has properly demonstrated valid scientific justification for her application. Additionally, DAR staff feels that the research proposed in Dr. Aeby's application is important for the continuation of a long-term coral disease monitoring program that has been ongoing since 2002 at these sites, and the results of this research are important for effective Monument management. The PMNM Monument Management Board concurs with this opinion.

However, because Dr. Aeby is currently under an on-going investigation for alleged violations of her 2006 NWHI State Marine Refuge Scientific Research Permit, DAR staff cannot make a recommendation for an approval or disapproval of this application, and therefore defers to the State of Hawai'i, Board of Land and Natural Resources (Board) for the decision.

If approved by the Board, the applicant may 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:

1. Require Applicant to inform and consult with DAR regarding their cruise plan before each trip to the NWHI.
2. Research operations must cease if monk seals are present in the immediate vicinity.
3. No fishing is allowed in State Waters except as authorized under State law for subsistence, traditional, and customary practices by Native Hawaiians.
4. 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.
5. Tender and dive vessels operating within the Monument are encouraged to operate at slow speed and with a bow lookout in shallow water coral reef areas in order to minimize prop or bow damage to three dimensional coral reef habitat or endangered monk seals or sea turtles.
6. Tenders and small vessels must be equipped with engines that meet EPA emissions requirements.
7. Refueling of tenders and all small vessels must be done at the NOAA ship Hi'ialakai and outside the confines of the lagoons or near-shore waters.

8. This permit is not to be used for nor does it authorize the sale of collected organisms. Under this permit, the authorized research activity, including work involving a bioassay or bioprospecting, must be for non-commercial purposes, i.e., not involving the use or sale of any organisms, byproducts, or material collected within the Monument for obtaining patents or intellectual property rights for profit.
9. 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.

RECOMMENDATION:

“That the disapproval, or approval with the above stated conditions, of a Research Permit to Dr. Greta Aeby be deferred to the Board.”

Respectfully submitted,

DAN POLHEMUS
Administrator

APPROVED FOR SUBMITTAL

ALLAN A. SMITH
Acting Chairperson