

## **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:** Monica S. C. Carneiro da Silva

**Affiliation:** Centro de Biologia Ambiental, Faculdade de Ciencias, Universidade de Lisboa, Portugal

**Permit Category:** Research

**Proposed Activity Dates:** 7/2009 - 9/2009 (this is the approximate duration of the nestling period of the species; this is the best time to collect blood samples at day time because only the nestlings are present at the nests (at this time the adults return to the colonies only at night). The nestlings are easily accessed on their nests and cope with the human handling better than the adults.

**Proposed Method of Entry (Vessel/Plane):** n/a

**Proposed Locations:** Bulwer's Petrels colonies: Tern Island (French Frigate Shoals), Nihoa Island, Laysan Island

### **Estimated number of individuals (including Applicant) to be covered under this permit:**

For logistic reasons this application would rely on refuge managers and their teams or researchers already on the islands to collect the blood samples. Only one person (if experienced) or two (if less experienced) per island is required to carry out the work. This collaboration would have the advantage of minimising human presence (and disturbance) on the islands.

**Estimated number of days in the Monument:** Optimally, 20 samples would be collected from each location. For each island this could easily be carried out during one to two days, for a total of three to six days in the Monument.

### **Description of proposed activities:** (complete these sentences):

a.) The proposed activity would...

The proposed activity would involve taking blood samples from a burrow-nesting Procellariiform seabirds, the Bulwer's Petrel. These blood samples would be used to extract DNA in order to compare with samples already obtained from colonies in the Atlantic to answer questions about whether the populations from the Pacific and Atlantic oceans are genetically different and are demographically isolated.

b.) To accomplish this activity we would ....

To accomplish this activity we would collect a small sample of blood (50 microlitres) from 20 individuals (nestlings if possible, to ensure colony of origin) of each species from each colony. To collect a sample, the brachial vein is punctured with a thin needle, and the drop of blood that forms upon puncture is collected with a capillary tube and eluted in an Eppendorf tube with lysis buffer (inert solution which will preserve the DNA sample at room temperature). A little pressure is then applied at the collection spot with a small amount of cotton until the blood stops flowing. The bird is then returned to its nest, on each island. The process of taking the sample takes less than 5 minutes.

c.) This activity would help the Monument by ...

This activity would help the Monument by providing the local authorities in charge of management and conservation with information to define policies that take into account the levels of genetic diversity and uniqueness of each colony, and levels of gene flow for this ground-nesting seabird. For example, if populations of a species differ genetically, then loss of a population will lead to a severe decline in the species' genetic diversity, potentially increasing the overall risk of extinction. Although populations of this species are considered stable by BirdLife Conservation, their general small population sizes renders them susceptible to extinction, and their current status is considered either rare or vulnerable. By revealing how genetic variation is partitioned among and within populations and how demographically autonomous they are, the molecular approaches we are proposing to employ will help characterize the genetic diversity that conservation biology seeks to preserve.

The current taxonomic status of Bulwer's Petrels is unclear. Populations of this species in the Atlantic and Pacific Oceans have been diverging for a long time and may have accumulated significant differences which would warrant them a different species status. Conservation efforts will need to take this information into account in order to decide whether they should be considered different management units.

Portugal and Hawaii currently hold some of the most important populations of this species and there should be a concerted effort for the conservation of its populations. Results will be presented in scientific meetings and eventually will be published in international, peer-reviewed, journals. We will also elaborate reports to local management authorities, such as the Parque Natural da Madeira, Portugal, and if appropriate, the Papahānaumokuākea Marine National Monument and Hawaiian Fish and Wildlife Services, USA.

**Other information or background:**

This proposed research is part of a broader project to study comparative phylogeography of two pairs of Procellariiform seabirds. The first pair includes the Bulwer's Petrel and Band-rumped Storm-Petrel (*Oceanodroma castro*). The other pair of species includes the White-faced Storm-Petrel (*Pelagodroma marina*) and Little Shearwater (*Puffinus assimilis*), which have populations in the NE Atlantic Ocean (Portugal), South Atlantic Ocean (Gough Island, UK) and New Zealand. We have established collaborations with researchers from South Africa, Australia and New Zealand and sampling of these four species is currently under way.

Populations of all four species from the NE Atlantic (Portugal and the Cape Verde Islands) have already been collected and we have initiated the development of the molecular markers required to carry out the analysis. Specifically, we have so far isolated twelve markers for Bulwer's Petrels .

A research grant has been awarded by the Fundacao para a Ciencia e a Tecnologia (the Portuguese equivalent to the National Science Foundation) which covers mainly the laboratory costs. For more information please see [http://www.fct.mctes.pt/projectos/pub/2006/Painel\\_Result/default2.asp?idElemConcurso=927](http://www.fct.mctes.pt/projectos/pub/2006/Painel_Result/default2.asp?idElemConcurso=927)

Contacts are being pursued to renew the relevant state permits, such as a permit from the Hawaiian Division of Forestry and Wildlife.

We applied for a permit last year to carry out this research which was approved by the board of trustees (PMNM-2008-029). However, because this work relies on the availability of researchers or Fish and Wildlife personnel already working or visiting the islands, we were unable to carry out the work last season for lack of suitable personnel at the right time on the islands.