

Preventing the Spread of Crab-eating Macaques in the Republic of Palau:

1. CENSUS OF CAPTIVE (PET) MACAQUE MONKEYS

2. SPAY/NEUTER CLINIC

JANUARY 2011



BIODIVERSITY
CONSERVATION
LESSONS LEARNED
TECHNICAL SERIES

6

**CONSERVATION
INTERNATIONAL**

Pacific Islands



BIODIVERSITY CONSERVATION LESSONS LEARNED TECHNICAL SERIES

6

Preventing the Spread of Crab-eating Macaque Monkeys in the Republic of Palau

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ABOUT THE BIODIVERSITY CONSERVATION LESSONS LEARNED TECHNICAL SERIES

This document is part of a technical report series on conservation projects funded by the Critical Ecosystem Partnership Fund (CEPF) and the Conservation International Pacific Islands Program (CI-Pacific). The main purpose of this series is to disseminate project findings and successes to a broader audience of conservation professionals in the Pacific, along with interested members of the public and students. The reports are being prepared on an ad-hoc basis as projects are completed and written up.

In most cases the reports are composed of two parts, the first part is a detailed technical report on the project which gives details on the methodology used, the results and any recommendations. The second part is a brief project completion report written for the donor and focused on conservation impacts and lessons learned.

The CEPF fund in the Polynesia-Micronesia region was launched in September 2008 and will be active until 2013. It is being managed as a partnership between CI Pacific and CEPF. The purpose of the fund is to engage and build the capacity of non-governmental organizations to achieve terrestrial conservation. The total grant envelope is approximately US\$6 million, and focuses on three main elements: the prevention, control and eradication of invasive species in key biodiversity areas (KBAs); strengthening the conservation status and management of a prioritized set of 60 KBAs and building the awareness and participation of local leaders and community members in the implementation of threatened species recovery plans.

Since the launch of the fund, a number of calls for proposals have been completed for 14 eligible Pacific Island Countries and Territories (Samoa, Tonga, Kiribati, Fiji, Niue, Cook Islands, Palau, FSM, Marshall Islands, French Polynesia, Wallis and Futuna, Eastern Island, Pitcairn and Tokelau). By late 2010 more than 35 projects in 9 countries and territories were being funded.

The Polynesia-Micronesia Biodiversity Hotspot is one of the most threatened of Earth's 34 biodiversity hotspots, with only 21 percent of the region's original vegetation remaining in pristine condition. The Hotspot faces a large number of severe threats including invasive species, alteration or destruction of native habitat and over exploitation of natural resources. The limited land area exacerbates these threats and to date there have been more recorded bird extinctions in this Hotspot than any other. In the future climate change is likely to become a major threat especially for low lying islands and atolls which could disappear completely.

For more information on the funding criteria and how to apply for a CEPF grant please visit:

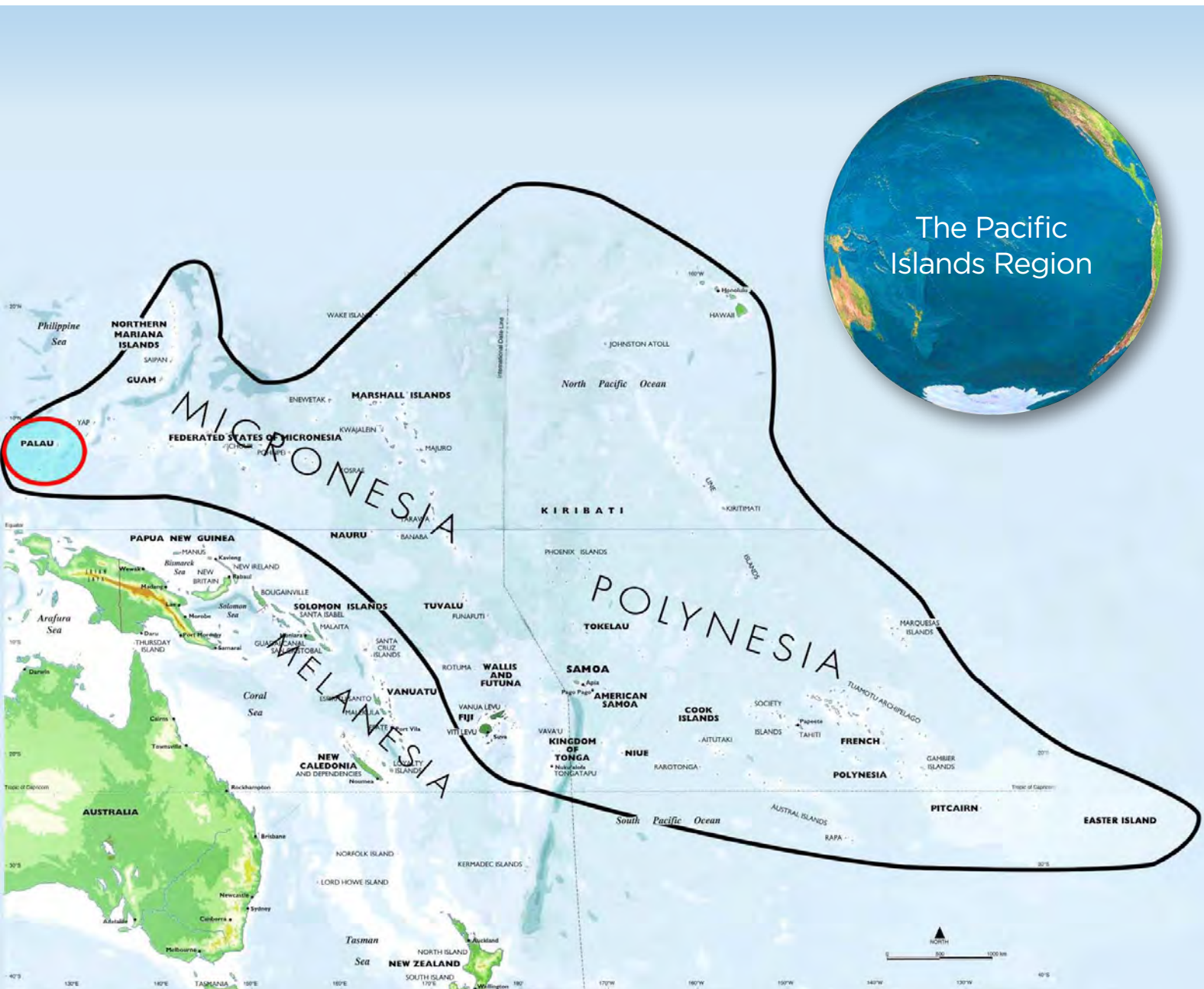
- www.cepf.net/where_we_work/regions/asia_pacific/polynesia_micronesia/Pages/default.aspx
- www.cepf.net

For more information on Conservation International's work in the Pacific please visit:

- www.conservation.org/explore/asia-pacific/pacific_islands/pages/overview.aspx

or e-mail us at cipacific@conservation.org

Location of the project in the Polynesia-Micronesia Biodiversity Hotspot



Contents

This report describes two related projects funded by CEPF. Project 1 describes a census of captive macaques in Palau coordinated by the Palau Conservation Society, while Project 2 describes a spay/neuter clinic of captive macaques coordinated by PAWS that built on the findings of the census.

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Crab-eating macaque. Source: Fotopedia; credit: [DDSNET](#).

Lessons Learned

Three major lessons were learned during the course of this project:

Allow at least twice as much time as you think necessary for a project to account for delays. In particular, additional time needs to be worked into the schedule of household surveys to allow for repeat visits when people are not home.

Young and inexperienced workers need to be supervised very closely in order to ensure that they know what is expected of them and that they are heading in the right direction. They also should be given a lot of support and encouragement so they do not lose their initial enthusiasm for a project.

People will cooperate with a project if it is clearly explained and if a positive and non-coercive approach is used. This is particularly important when the project addresses issues that have legal implications. For example, the exportation of macaques from Angaur is illegal. However, we reassured the owners of macaques that their pets would not be confiscated or harmed regardless of how they had been obtained. This greatly helped to improve the level of cooperation among census participants.

Project Design Process

Aspects of the project design that contributed to its success/shortcomings.

This project was very focused and had a specific output - the completion of a census of captive macaques in Palau. The success of the project was due to this focus and clarity of purpose.

Project Implementation

Aspects of the project execution that contributed to its success/shortcomings.

The project was greatly enhanced by the collaboration between Palau Conservation Society and the Palau Bureau of Agriculture, both members of the Palau National Invasives Species Committee. The collaboration helped to enhance implementation as both groups were able to provide relevant contributions to the project. In addition, we were very lucky to hire three fantastic student interns with energy and enthusiasm for the project.



From *A Scoping Assessment For an Asia-Pacific Invasive Species Initiative*, A Report to The Nature Conservancy, Phil Shearman 5 August 2001.

Lessons Learned

Project Design Process

Aspects of the project design that contributed to its success/shortcomings.

The success of sterilizing the breeding population of captive macaques in Palau outside of Angaur state was highly dependent upon the prior survey of existing macaques conducted in 2009 by the Palau Conservation Society. The thoroughness of the sterilization process was therefore highly dependent on several factors, some of which were not directly done by this project.

The initial macaque survey of captive animals needed to be accurate; otherwise confusion would arise during scheduling and implementation. Information from this prior macaque survey was successfully used to locate most captive macaques. The community also needed to be well-informed through public education before and at the time of surgeries so that any animals missed in the initial survey would be made available for surgery.

Project Implementation

Aspects of the project execution that contributed to its success/shortcomings.

While support by individuals with pet macaques regarding their sterilization ranged from indifferent to positive, the existence of the Sterilization Order with penalties for non-compliance was critical to insure participation. A voluntary system without penalties would have been much less thorough. At the same time, the public awareness before and during the clinic did locate four additional macaques that had been missed during the prior year's survey.

Having knowledgeable veterinarians, experienced in all aspects of macaque behavior and medical care, was essential to the project's success, as it allowed rapid and effective processing of animals. The vets participated in the collection of most macaques from the owner's homes and they were able to provide significant comment and owner education on the need to sterilize the animals, in addition to providing help with the health and welfare of these captive animals.

All sterilized macaques were microchipped with a unique identification number, and all owners were given a Sterilization Certificate to document compliance with the BOA Sterilization Order. If follow-up to the sterilization clinic is undertaken by BOA, the spay/neuter certificate and microchip for each sterilized monkey will allow any new migration of monkeys from Angaur to be detected.



Clockwise from top left: Crop damage by macaques, Angaur. Betelnut damage on Angaur. Captive macaque. Owner collects pet macaque.

Census OF CAPTIVE (PET) MACAQUE MONKEYS

Submitted to Dr. Joel Miles by Ngedikes Benedict and Ngirbechat Arsenio, August 31, 2009

Summary

A census of captive (pet) macaque monkeys and other household animals was conducted from March through July 2009 in the Republic of Palau. All households, businesses, and government offices were surveyed. Thirty-four (34) captive macaques were located: 14 males and 20 females. Contact information for macaque owners was gathered in preparation for a sterilization project to be carried out later in 2009. Information on other household animals will be provided to partner agencies and other interested groups and individuals.

Introduction/Background

Macaque monkeys have caused severe socio-economic and environmental damage to the people and island of Angaur State, Republic of Palau. They cause problems to plants, animals, and people. They are a threat to agriculture in Angaur. A 2005 survey of forest birds showed that Angaur has the lowest bird population of any island in Palau, while the nearby island of Peleliu has the greatest diversity and number of birds. Macaques also impose a serious threat to human health. Part of macaque behavior is to bite and scratch, and owners are often victims of their own pets. In addition to physical injury, there is a high risk of infection. Macaques are potential carriers and transmitters of several serious human diseases, including B-virus, which is lethal to humans in approximately 80 percent of cases.

It is the goal of the National Invasive Species Committee (NISC) to control and eventually eradicate the macaque monkey population in the Palau Islands. Macaque control/eradication in Palau will require careful planning and must be implemented in several steps or phases. Macaques are much more intelligent than other animals, and any attempt to eradicate them must be thoroughly planned and adequately funded. The National Invasive Species Committee (NISC) is working with the Angaur State Government and several local agencies and organizations, and has requested the support of Island Conservation, a nongovernmental organization (NGO) which specializes in restoration of island ecosystems, to conduct a feasibility study for the complete eradication of macaques from Angaur. Once this study has been completed, we will develop an eradication plan, and begin to seek the funding that will be necessary to successfully implement the plan.

In the meantime, the rest of Palau, especially the forests of the large island of Babeldaob, is at risk of the same damage that is already happening to Angaur. A national law prohibiting transport of macaques outside of Angaur to the other islands in the Palau archipelago (PNC 342311) was enacted in 1972, but it has not

been consistently enforced, and over the years numerous captive macaques have been brought as pets to Koror, where the majority of Palau's residents live. We must act now to completely stop the movement of monkeys from Angaur to the rest of Palau, and to ensure that those already outside of Angaur cannot reproduce. This can only be done by first sterilizing all pet monkeys (captive macaques), to be followed by strict enforcement of PNC 34-2311, which prohibits the transport of monkeys from one island to another within the Republic, and then trapping pet monkeys that have escaped into the forests of Babeldaob and Koror.

The NISC is working with the Palau Animal Welfare Society (PAWS), the Koror State Animal Shelter, Palau Conservation Society, and several other agencies and organizations to sterilize all pet monkeys in Palau. We are in contact with veterinarians in Australia and Hong Kong who are prepared to assist with the sterilization project. To ensure that all pet monkeys are sterilized, it was necessary to conduct a thorough census of all pet/captive monkeys in Palau. This report describes the census process and summarizes the results of the census.

Census Process

Two Palau Community College (PCC) students, Ngedikes Benedict and Ngirbechat Arsenio, were employed by Palau Conservation Society (PCS) to conduct the survey. They were supervised by the National Invasive Species Coordinator, Dr. Joel Miles, in the national government Bureau of Agriculture. To conduct the survey, the two census interns were provided with a portable computer and a truck, and office space at the Bureau of Agriculture.

Before the census began, and throughout the duration of the census, several activities were undertaken to inform the public about the macaque monkey problem and the census. Public education started with slide shows on the local public television channel that portrayed the macaque as a dangerous, invasive, and illegal primate. Flyers (attached) were printed and distributed to introduce the community to the macaque problem, the census surveyors, and the objective of the project. Interviews were aired on a local TV channel and the government radio station. Three public service video spots were created and aired throughout the census on a local television station.

The census form (attached) is a single letter-sized sheet of paper. While the primary purpose of the census was to locate all pet macaque monkeys, the macaque census survey form was designed to collect other data on all pet and domestic animals that would be valuable to the other agencies and organizations. The first section of the form is to obtain the Location and Demographic Information. This information includes the name of the property owner, contact numbers (home, work or cell), state, hamlet/village, the type of property (whether it is commercial, a private residence, or other which the surveyors will specify), and the number of attempts to speak with the home owner (note: this section of the form was rarely used because most people who were interviewed cooperated to fill the survey).

The second section of the form is the Macaque Monkey Assessment Survey. If a property owner owns or has a macaque on his/her property then the GIS coordinates of the property are taken and recorded. The macaque's gender, body condition (scored from 1 to 5, with 1 being poor condition and 5 indicating excellent condition), age (whether an infant, juvenile, or adult), type of restraint (whether it is free, caged, tethered, or a combination of restraints), and history of biting or scratching is also recorded. In addition to asking if the property owner has a pet macaque, they are also asked if they have seen a loose macaque. If they have, then the area, location, and time of when the monkey was seen is recorded. The gender and age of the macaque, if known, is also recorded.

The surveyor is only to fill the Loose Macaque section of the form if the interviewee was the one who saw the loose macaque. If the interviewee has not seen a loose macaque, but has heard from others about a loose macaque, then that information is recorded in the Comments section of the Loose Macaque section.

The third section of the form is the Household Animal Assessment Survey. This is where the surveyors ask how many pets/household animals there are. First, the number of pet dogs is counted according to gender, i.e. if there are a total of 7 dogs: Male #: 5; Female #: 2. Then it is recorded how many of each gender of dog are sterilized, how many females, if any, are pregnant, and how many puppies there are (note: the number of puppies are not included in the male and female count of the dogs). Because Koror State has a law that requires all dog owners to register their dogs, the survey also asks whether the dog(s) have tags and whether they were registered in 2009 or in prior years. The number of stray dogs that are regularly seen on the property is also counted. Stray dogs may mean any dogs, whether they have tags or not, that do not belong to the owner of the property. Second, the same information (not including registration) such as gender, fertility, pregnancy, and the number of kittens is collected for cats. The third animal of interest is pigs. Again, the information collected includes gender, fertility, pregnancy, the number of piglets, and number of growers. (Growers are the pigs that are no longer nursing, but are not yet mature enough to reproduce.) The fourth category is chickens and ducks. The information collected is the estimated number (if exact is not known) of chickens and/or ducks owned, and whether the eggs of either/both are consumed. The last categories on the animal survey are the number of pet fruit bats and any other pets the owner has such as saltwater crocodiles, pigeons, or turtles.

The fourth section of the form is the Census Assessment, which is an overall summary of the survey. Here, the owner is asked if they experience any rat problems, i.e. rats running on ceiling or roof, rats eating food, chewing holes in the house, or eating crops, and any additional comments from the owner are recorded. The total number of animals on the property, including the number of stray animals and the number of macaques, is recorded. The date the survey is completed, and the initials of the surveyor are marked on the bottom of the survey form.

All data collected were recorded in a database created with the support of the Palau Automated Land and Resources Information System (PALARIS), a national government agency responsible for collection and maintenance of information on the nation's natural resources. The data have thus become part of a national repository of data on Palau's natural resources. The database includes the GPS location and contact information for the owners of all captive macaques, information which will be essential for conduct of the sterilization program.

Census Results and Discussion

There are a total of 34 captive macaques in the Palau Islands; fourteen males and twenty females. There have been reports that some monkeys have died since the census was conducted, so the total number may be slightly less. There is also a chance that not all pet macaques were counted because the home owners were not present during the visit. We are confident in saying we have counted almost all or possibly all of the pet macaques in the Palau Islands. The estimate of wild macaques is beyond the scope of this survey.

The data are shown in two tables, in Appendix 1. Table 1 shows the number of macaques per state by age, and Table 2 shows the macaque count per state by gender. Data for other household animals are not presented in this report: they will be made available to partner agencies such as the Bureau of Agriculture, the Palau Animal Welfare Society, and others.

There are many factors that affect the accuracy of the data collected. First of all, most, but not all households and businesses were included in the census. Some houses had nobody home whenever they were visited. In some cases, a neighbor would know the absent attendant/property owner’s pet and contact information, so the form would still be filled, and if any questions arise later, the owner/neighbor/informant could be contacted for verification. In other situations such as people living in barracks or apartment complexes, or an extended family living in several buildings in one area, only one form would be filled and would include all the pets in the area. The Name of Owner would either list the name of the owner of the building/barracks or head of the household (in extended family situations).

The data collected for the number of sterilized dogs and cats might have a large error. In some situations, when conducting the survey in English to people who speak English as a second language, “sterilized” may be misunderstood as to mean “vaccinated”, “free of parasites” or “having taken anti-parasite medication”. The surveyors realized this about halfway through conducting the census survey and thereafter were careful to make sure the interviewees understood what “sterilization” meant. In addition, the numbers of stray dogs and cats are probably inflated; the same stray dog or cat could have been reported by several households in the same neighborhood. The actual number of strays is almost certainly considerably less than the data indicate.

TABLE 1: Macaque Count by Age

State	Infant	Juvenile	Adult	Unknown	
Aimeliik			1		
Airai		2	4		
Angaur	1	3			
Kayangel					
Koror		4	6	5	
Melekeok	1		1		
Ngaraard					
Ngarchelong		2			
Ngardmau			1		
Ngaremlengui					
Ngatpang		1			
Ngchesar					
Ngiwal			1		
Peleliu			1		
Totals	2	12	15	5	34

TABLE 2: Macaque Count by Gender

State	Male	Female
Aimeliik		1
Airai	2	4
Angaur	2	2
Kayangel		
Koror	9	6
Melekeok	1	1
Ngaraard		
Ngarchelong		2
Ngardmau		1
Ngaremlengui		
Ngatpang		1
Ngchesar		
Ngiwal		1
Peleliu		1
Totals	14	20



Clockwise from top left: Blood draw on Angaur. Karemele and macaque. Owner and pet macaque. Radio outreach. Vets meet with Angaur government. Vets preparing for clinic.

BIODIVERSITY CONSERVATION LESSONS LEARNED TECHNICAL SERIES

CEPF Small Grant Final Project Completion Report Preventing the Spread of Crab-eating Macaques in the Republic of Palau

Organization Legal Name

Palau Conservation Society

Project Title

Preventing the Spread of Crab-eating Macaques in the Republic of Palau

Date of Report

19 September 2009

Report Author and Contact Information

Elizabeth Matthews, PhD

ematthews@palauconservation.org or lizmat@palaunet.com

CEPF Region

Polynesia-Micronesia Hotspot

Strategic Direction

1. Prevent, control and eradicate invasive species in key biodiversity areas.

Grant Amount

\$19,775

Project Dates

1 February 2009 – 31 July 2010

Implementation Partners for this Project

Please explain the level of involvement for each partner

- Palau Conservation Society: overall project management; administrative, technical and logistic support; assist with education and awareness component of the project
- Bureau of Agriculture, Republic of Palau: supervise student interns as they conduct census; compile data and report on the census; work with PCS on the education and awareness component

Conservation Impacts

Please explain/describe how your project has contributed to the implementation of the CEPF ecosystem profile

This project works towards CEPF Strategic Direction 1 for the Polynesia-Micronesia Biodiversity Hotspot: Prevent, control and eradicate invasive species in key biodiversity areas. In particular, the proposed project focuses on the control of a potentially devastating introduction of the alien invasive crab-eating macaques to the upland forests of Babeldaob Island, identified as a priority for site-level investment (site #144) in the CEPF Ecosystem Profile of Polynesia-Micronesia. Currently macaques are mostly restricted to Angaur island of Palau. The goal of this project was to identify all captive macaques outside of Angaur in order to target them for a sterilization campaign later in the year.

Please summarize the overall results/impact of your project against the expected results detailed in the approved proposal

This project met all expected results as detailed in the approved proposal. As a first step in a long-term process preventing the spread of crab-eating macaques to KBAs in Palau, a census was conducted throughout Palau to locate all captive (pet) macaques for a planned sterilization campaign. The census was conducted by three student interns from March through July 2009 at 2,372 households, businesses, and government offices. Thirty-four (34) captive macaques were located: 14 males and 20 females. Contact information for macaque owners was gathered in preparation for a sterilization project that will be carried out in November, 2009.

In addition to the census, this project included a public awareness component. Public education started with slide shows on the local public television channel that portrayed the macaque as a dangerous, invasive, and illegal primate. Flyers were printed and distributed to introduce the community to the macaque problem, the census surveyors, and the objective of the project. Interviews were aired on a local TV channel and the government radio station. Three public service video spots were created and aired throughout the census on a local television station. To ensure honest responses to the census, all awareness activities regarding the census reassured monkey owners that their pets would not be harmed or confiscated.

Please provide the following information where relevant

- *Hectares Protected:* N/A
- *Species Conserved:* N/A
- *Corridors Created:* N/A

Describe the success or challenges of the project toward achieving its short-term and long-term impact objectives

This project was successfully implemented. Three student interns interviewed all households and businesses in Palau, and we believe that they located all captive/pet macaques. At first we thought that two interns could successfully complete the census over three months. However, we soon discovered that we needed to hire an additional intern for a portion of the work. Once the third intern had been hired and trained, the census was completed as planned. The factors which contributed to the success of the project included:

- Hard work and dedication by the student interns.
- Good publicity through radio talk shows, television advertisements, and flyers. Ongoing publicity about the threat of the macaques also helped.
- Flexibility in scheduling of work, including a lot of evening and weekend work.
- Excellent cooperation by the public.
- Support of local governments in informing residents and in some cases, local government staff who accompanied the interns to facilitate interviews.
- A well-designed survey form (initially designed by the epidemiologist at the national hospital).
- Excellent support by PALARIS, the national government agency responsible for keeping data on Palau's natural resources.
- Effective collaboration and coordination among all of the partners involved.

Were there any unexpected impacts (positive or negative)?

The unexpected impact that occurred during the course of this project was that several people voluntarily gave up their pet macaques to be euthanized. This is a direct result of the awareness campaign and of the interns talking to them about the purpose of the census. These people decided that the risk of keeping these animals as pets was too great. This is a result that was unanticipated.

Lessons Learned

Describe any lessons learned during the design and implementation of the project, as well as any related to organizational development and capacity building. Consider lessons that would inform projects designed or implemented by your organization or others, as well as lessons that might be considered by the global conservation community.

Three major lessons were learned during the course of this project:

Allow at least twice as much time as you think necessary for a project to account for delays. In particular, additional time needs to be worked into the schedule of household surveys to allow for repeat visits when people are not home.

Young and inexperienced workers need to be supervised very closely in order to ensure that they know what is expected of them and that they are heading in the right direction. They also should be given a lot of support and encouragement so they do not lose their initial enthusiasm for a project.

People will cooperate with a project if it is clearly explained and if a positive and non-coercive approach is used. This is particularly important when the project addresses issues that have legal implications. For example, the exportation of macaques from Angaur is illegal. However, we reassured the owners of macaques that their pets would not be confiscated or harmed regardless of how they had been obtained. This greatly helped to improve the level of cooperation among census participants.

Project Design Process: (aspects of the project design that contributed to its success/ shortcomings)

This project was very focused and had a specific output - the completion of a census of captive macaques in Palau. The success of the project was due to this focus and clarity of purpose.

Project Implementation: (aspects of the project execution that contributed to its success/ shortcomings)

The project was greatly enhanced by the collaboration between Palau Conservation Society and the Palau Bureau of Agriculture, both members of the Palau National Invasives Species Committee. The collaboration helped to enhance implementation as both groups were able to provide relevant contributions to the project. In addition, we were very lucky to hire three fantastic student interns with energy and enthusiasm for the project.

Additional Funding

Provide details of any additional donors who supported this project and any funding secured for the project as a result of the CEPF grant or success of the project.

Donor	Type of funding*	Amount	Notes
PCS	In kind contribution	\$5,000	Staff time
Bureau of Agriculture	In kind contribution	\$2,500	Staff time

*Additional funding should be reported using the following categories:

- A Project co-financing (Other donors contribute to the direct costs of this CEPF project)
- B Grantee and Partner leveraging (Other donors contribute to your organization or a partner organization as a direct result of successes with this CEPF project.)
- C Regional/Portfolio leveraging (Other donors make large investments in a region because of CEPF investment or successes related to this project.)

Sustainability/Replicability

Summarize the success or challenge in achieving planned sustainability or replicability of project components or results.

The project is easily replicated in other sites, and for other species. We will gladly provide the survey form that was used as well as any informational materials that were produced as a result of the project.

Summarize any unplanned sustainability or replicability achieved.

No unplanned replicability was achieved in this project.

Safeguard Policy Assessment

Provide a summary of the implementation of any required action toward the environmental and social safeguard policies within the project.

There was no required action toward environmental and social safeguard policies for this project.

Performance Tracking Report Addendum

CEPF Global Targets (01 January 2009 – 31 August 2009)

Provide a numerical amount and brief description of the results achieved by your grant. Please respond to only those questions that are relevant to your project.

PROJECT RESULTS	If relevant, provide your numerical response for results achieved during the annual period.	Provide your numerical response for project from inception of CEPF support to date.	Describe the principal results achieved from 1 January 2009–31 August 2009. (Attach annexes if necessary)
1. Did your project strengthen management of a protected area guided by a sustainable management plan? Please indicate number of hectares improved.			
2. How many hectares of new and/or expanded protected areas did your project help establish through a legal declaration or community agreement?			
3. Did your project strengthen biodiversity conservation and/or natural resources management inside a key biodiversity area identified in the CEPF ecosystem profile? If so, please indicate how many hectares.	\$ 21,000	same	Babeldaob island upland forest.
4. Did your project effectively introduce or strengthen biodiversity conservation in management practices outside protected areas? If so, please indicate how many hectares.	\$ 21,000	same	Babeldaob island upland forest.
5. If your project promotes the sustainable use of natural resources, how many local communities accrued tangible socioeconomic benefits?			

Information Sharing and CEPF Policy

CEPF is committed to transparent operations and to helping civil society groups share experiences, lessons learned, and results. Final project completion reports are made available on our website, www.cepfn.net, and publicized in our newsletter and other communications.

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BIODIVERSITY CONSERVATION LESSONS LEARNED TECHNICAL SERIES

CEPF Small Grant Final Project Completion Report Spay/Neuter Clinic to Prevent the Spread of Crab-eating Macaques

Organization Legal Name

Palau Animal Welfare Society (PAWS)

Project Title

Spay/Neuter Clinic to Prevent the Spread of Crab-eating Macaques in the Republic of Palau

Date of Report

14 April 2010

Report Author and Contact Information

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Fax: (680) 488-5513;
Email: crrf@palaunet.com

CEPF Region

Polynesia-Micronesia Hotspot

Strategic Direction

1. Prevent, control and eradicate invasive species in key biodiversity areas.

Grant Amount

\$20,000

Project Dates

1 August 2009 – 31 July 2010

Implementation Partners for this Project

Please explain the level of involvement for each partner

- Koror State Government Animal Shelter and Veterinary Clinic – KSG employees, including the veterinarian, veterinary assistant and para-vets, assisted in all aspects of the macaque spay/neuter clinic through hands-on participation and assistance with animal collection, handling and surgeries to logistics. Medical procedures took place at the KSG vet clinic.
- National Invasive Species Committee (NISC), Bureau of Agriculture (BOA), Palau – Through the NISC, the BOA issued the “Order of Removal/Destruction/Treatment” of all captive macaque monkeys in Palau. NISC also assisted the Project Coordinator in publicity and awareness for the sterilization clinic, in addition to hosting a post-clinic interview with the visiting vets regarding the non-native macaques and their effects on Palau’s environment.
- Dr. Paolo Martelli (Ocean Park, Hong Kong), Dr. Karthi Martelli (RSPCA, Hong Kong), and Dr. Karmele Llano Sanchez (International Animal Rescue, Indonesia) – The spay/neuter surgeries were performed by 2 volunteer visiting vets from Hong Kong and one volunteer visiting vet from Indonesia, assisted by the local Koror State veterinarian.

Conservation Impacts

Please explain/describe how your project has contributed to the implementation of the CEPF ecosystem profile

This project works towards CEPF Strategic Direction 1 for the Polynesia-Micronesia Biodiversity Hotspot: Prevent, control and eradicate invasive species in key biodiversity areas. In particular, the proposed project focused on the control and prevention of a breeding population of a potentially devastating introduction of the alien invasive crab-eating macaques to the upland forests of Babeldaob Island, identified as a priority for site-level investment (site #144) in the CEPF Ecosystem Profile of Polynesia-Micronesia.

Please summarize the overall results/impact of your project against the expected results detailed in the approved proposal

Introduction

Macaque monkeys have caused severe socio-economic and environmental damage to the people and island of Angaur State, Republic of Palau. They cause problems to plants, animals, and people. They are a threat to agriculture in Angaur. A 2005 survey of forest birds showed that Angaur has the lowest bird population of any island in Palau, while the nearby island of Peleliu has the greatest diversity and number of birds. Macaques also impose a serious threat to human health. Part of macaque behavior is to bite and scratch, and owners are often victims of their own pets. In addition to physical injury, there is a high risk of infection. Macaques are carriers and transmitters of several serious human diseases, including Herpes B-virus, which is lethal to humans in approximately 80 percent of cases. The spread of macaques is a significant threat to the biodiversity of all of the Republic of Palau, and this project is the first step of a longer-term control program.

It is the goal of the National Invasive Species Committee (NISC) to control and eventually eradicate the macaque monkey population in the Palau Islands. The Palau Animal Welfare Society (PAWS) is

committed to assisting in this project to ensure the overall animal health in Palau is met. Macaque control/eradication in Palau will require careful planning and must be implemented in several steps or phases. Macaques are much more intelligent than other animals, and any attempt to eradicate them must be thoroughly planned and adequately funded. The National Invasive Species Committee (NISC) is working with the Angaur State Government, PAWS and several local agencies and organizations, and has requested the support of Island Conservation, a non-governmental organization (NGO) which specializes in restoration of island ecosystems, to conduct a feasibility study for the complete eradication of macaques from Angaur. Once this study has been completed, we will develop an eradication plan, and begin to seek the funding that will be necessary to successfully implement the plan.

In the meantime, the rest of Palau is at risk of the same damage that is already happening on Angaur. A national law prohibiting transport of macaques outside of Angaur to the other islands in the Palau archipelago (PNC 34-2311) was enacted in 1972, but has not been consistently enforced, and over the years numerous captive macaques have been brought as pets to Koror, where the majority of Palau's residents live. We must act now to completely stop the movement of macaques from Angaur to the rest of Palau, and to ensure that those already outside of Angaur cannot reproduce. This can only be done by first sterilizing all pet macaques (captive macaques), to be followed by strict enforcement of PNC 342311, which prohibits the transport of macaques from one island to another within the Republic, and then trapping pet macaques that have escaped into the forests of Babeldaob, Koror and Peleliu.

A census of captive (pet) macaque monkeys and other household animals was conducted from March through July 2009 in the Republic of Palau with the support of CEPF through a grant to the Palau Conservation Society (PCS). All households, businesses, and government offices were surveyed. PCS has the results of this survey. Contact information for macaque owners was gathered in preparation for the sterilization project.

Methods and Implementation of the Sterilization Program

- The Sterilization Clinic Project was held from November 9-17, 2009. The purpose of this sterilization project was to ensure that the macaques will not be able to reproduce if they escape from their owners. This will prevent the spread of macaques throughout Palau, where they can cause significant economic and environmental harm. It is part of a long term project to entirely remove the threat of macaques to the Republic.
- The Clinic was held at the Koror State Animal Shelter and Veterinary Clinic, with the assistance of three veterinarians from Hong Kong and Indonesia, Dr. Paolo Martelli, Dr. Karthi Martelli, and Dr. Karmelee Llano Sanchez. These three veterinarians have extensive experience handling and sterilizing macaque monkeys in Hong Kong and throughout Southeast Asia. They brought specialized medical equipment with them for use in surgery, and shared their expertise with the staff of the Animal Shelter.
- To organize the sterilization project, PAWS hired Mr. Ngirbechat Arsenio as the coordinator for the sterilization clinic. Mr. Arsenio was supervised by then NISC coordinator Dr. Joel Miles, to ensure the success of the sterilization clinic. Mr. Arsenio's duties are detailed in the attached Job Description (Attachment 1).
- Six weeks prior to the clinic, the macaque sterilization order issued by the Palau Bureau of Agriculture was distributed to owners of pet macaques in all parts of Palau, excluding macaques resident on Angaur and the Southwest Islands. (See Order, Attachment 2). At the same time Mr.

Aresenio worked closely with the NISC Dr Joel Miles on public awareness activities prior to the spay-neuter clinic, including preparation, printing, and posting of flyers, printing the sterilization order in local newspapers, appearance in radio talk shows, and other awareness activities and related activities.

- Remain in constant communication with clinic organizers (PAWS/BOA/KSG) by insuring available air time for cell phone and checking email daily.
- Be available for unforeseen tasks, especially as clinic date approaches.
- Produce and submit a report summarizing the sterilization project.

Results of the Sterilization Clinic

A total of 27 pet macaques were brought to the macaque spay/neuter clinic (See Table of Macaque Sterilizations, Attachment 3). This included 23 macaques recorded in the animal survey, and 4 walk-ins. During the clinic there were 4 macaques that were sterilized that had not been recorded in the previous animal census. These pet owners responded to the public awareness campaign and called the clinic to have their animal scheduled for surgery. Because it is not illegal to own macaques in Angaur, the sterilization project determined that it would be waste of time, money, and medical supplies to sterilize the 4 pet macaques on Angaur at this time.

Several of the pet macaques had serious health problems, and 27% tested positive for Herpes B-Virus (n=26). Due to poor health, or for other reasons, 11 pet macaques were euthanized at the request of their owners (7 before and 4 after the sterilization surgery), 10 females and 1 male (see Euthanized Table, Attachment 4). A total of 16 pet macaques (11 females, 5 males) were sterilized, using laparoscopic techniques, and returned to their owners in Koror and Babeldaob, including one female that was already sterile due to a uterine tumor. Of these, 3 tested positive for B-Virus (20%). The macaques were also de-wormed, inserted with microchips, and their blood was checked for other diseases that could be transmitted to humans. Once the pet macaques were sterilized and had a full medical check-up, a Macaque Sterilization Certificate was issued to the owners. Information on the disease status of the macaques has been provided to the Ministry of Health for appropriate action. Owners of diseased macaques were also informed. Macaque data from the clinic is held by both the National Invasive Species Committee and the Koror State Animal Shelter.

An added bonus to the project was a site visit by the team, including the three experienced macaque handlers and veterinarians, to the field sites of Peleliu State and Angaur State on 16 Nov 2009. This allowed a comparison between the two island states. They were able to evaluate the problems faced by the Angaur community due to the macaque overpopulation, and also got a good visual contrast of the unaffected, but at-risk island of Peleliu. These experts then communicated some of their thoughts and concerns via public radio on the following day, and also met with Governor Salii of Angaur state with recommendations for protecting farms on Angaur.

ATTACHMENT 1:

Coordinator Duties for Macaque Spay/Neuter Clinic

The Coordinator for the Macaque Spay/Neuter Clinic agrees to work on a collaborative project between the Palau Animal Welfare Society, The Palau Bureau of Agriculture and the Koror State Animal Shelter. The Coordinator will assist in the long-term control of macaques in Palau by coordinating a spay/neuter clinic for macaques to be held between 9 – 20 November 2009 and will coordinate activities as listed below. This position will begin on 1 October and last for approximately two months, depending on submission and acceptance of final report. The Coordinator will have the following duties:

1. Distribute macaque sterilization order issued by the Palau Bureau of Agriculture to owners of pet macaques in all parts of Palau, excluding macaques resident in Angaur and the Southwest Islands.
2. Work closely with the National Invasive Species Coordinator on public awareness activities prior to the spay-neuter clinic, including
 - Preparation, printing, and posting of flyers
 - Printing the sterilization order in local newspapers
 - Appearance in radio talk shows
 - Any other awareness activities.
3. Schedule (date/time/pick up) spay/neuter surgeries for pet macaques with owners.
4. Organize transportation for pick up of pet macaques and other clinic needs.
5. Organize or assist with:
 - Any donations associated with clinic and veterinarians
 - Accommodation for veterinarians
 - Transportation for veterinarians
 - Lunches during clinic

ATTACHMENT 2:

Order of Removal / Destruction / Treatment



BUREAU OF AGRICULTURE
Ministry of Natural Resources, Environment & Tourism
Republic of Palau

ORDER TO STERILIZE, REMOVE, OR DESTROY CAPTIVE/PET MONKEYS

Pursuant to his authority under 34 PNC § 2003 and Part 5.1b of the Plant and Animal Quarantine Regulations of the Government of Palau, the Director of the Bureau of Agriculture (BOA) hereby **orders that all captive/pet monkeys (*Macaca fascicularis*) in the Republic of Palau, except those on the island of Angaur, must be spayed or neutered (sterilized) and tested for disease, destroyed or given to the Bureau of Agriculture no later than November 30, 2009.** To make it easier for monkey owners to comply with this order, a clinic to provide the required services will be provided for free at the Koror State Animal Shelter on November 9th through November 20th, 2009. Transport of your monkey to and from the Shelter will also be provided free of charge. For information about the clinic please contact the Shelter at 488-5645, or the BOA at 544-5804.

This order is issued to protect the people, economy, and environment of Palau by preventing the spread of monkeys in Palau. Monkeys carry and spread diseases which can harm humans and other species. Monkeys also cause serious harm to agriculture and other economic sectors. In addition, monkeys are non-native species that are invasive and can cause damage to Palau's natural environment.

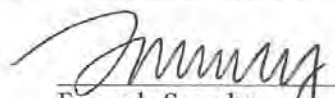
If you have a monkey in your possession or control, you must do one of the following before November 30, 2009:

1. Have all monkeys in your possession or control spayed or neutered (sterilized) and certified disease free by a licensed veterinarian. You must provide the certification and proof that the monkeys have been spayed or neutered to the Director of the Bureau of Agriculture no later than November 30, 2009, **OR**
2. Have all monkeys in your possession or control destroyed under the supervision of an officer of the Bureau of Agriculture, **OR**
3. Give all monkeys in your possession or control to an officer of the Bureau of Agriculture.

Note: The intentional or accidental release of a monkey to avoid compliance with this order will be considered a violation of this order, and will be subject to the same penalties as any other violation of this order.

FAILURE TO COMPLY WITH THIS ORDER MAY RESULT IN CRIMINAL PROSECUTION AND A FINE OF UP TO \$1,000.

SO ORDERED this 5th day of October, 2009


Fernando Sengebau
Director, Bureau of Agriculture

P.O. Box 460, Koror, Republic of Palau 96940
Tel.: (680) 544-5804 Fax: (680) 544-5090 E-mail Address: nisc@palaumet.com

ATTACHMENT 3

Table of Macaque Sterilizations

State	Gender	Sterilization Date	Microchip number	STERILIZED	Comments**	B-VIRUS	OWNER
KOROR	F	11/9/2009	042-086-563	YES	PTS	NEG	AIKO ARMALUUK
KOROR	F	11/9/2009	042-079-290	YES	RETURNED	POSITIVE	RICHARD NGIRNGERAK
KOROR	F	11/9/2009	042-115-023	YES	RETURNED	NEG	BITK RECHULD
KOROR	F	11/9/2009	042-106-282	STERILE – UTERINE TUMOR	RETURNED	NEG	MARGARET NGOTEL
AIRAI	M	11/10/2009	042-110-079	YES	PTS	POSITIVE	DELLA DELMEL
AIRAI	F	11/10/2009	042-072-060	YES	RETURNED		NGIRCHOCHIT RENGUUL
AIRAI	F	11/10/2009	042-071-090	YES	RETURNED	NEG	DAREK OLKERIIL
AIRAI	F	11/10/2009	042-106-121	YES	RETURNED	NEG	DAREK OLKERIIL
AIRAI	F	11/10/2009	042-083-271	YES	RETURNED	NEG	DELLA DELMEL
KOROR	M	11/10/2009	042-083-286	YES	PTS	NEG	BENITO MULEI
KOROR	F	11/10/2009	NO MICROCHIP	NO	PTS		MOSES YOBECH
KOROR	F	11/10/2009	NO MICROCHIP	NO	PTS		MOSES YOBECH
KOROR	F	11/10/2009	042-080-047	YES	RETURNED	NEG	YUMIKO SUGAWARA
KOROR	M	11/10/2009	042-094-570	YES	RETURNED	NEG	MIKEAS ISIDORO
KOROR	M	11/10/2009	042-105-302	YES	RETURNED	NEG	MARTHA RECHUCHER
KOROR	F	11/10/2009	042-086-883	YES	RETURNED	POSITIVE	ROLAND NGIRNGKOI
AIMELIIK	F	11/11/2009	NO MICROCHIP	NO	PTS	NEG	PAUL REKLAI
AIMELIIK	F	11/11/2009	NO MICROCHIP	NO	PTS	POSITIVE	NINO ERIICH/ BABY NINO
KOROR	F	11/11/2009	NO MICROCHIP	NO	PTS	POSITIVE	NERY KADOI
KOROR	M	11/11/2009	NO MICROCHIP	NO	PTS	NEG	NERY KADOI

State	Gender	Sterilization Date	Microchip number	STERILIZED	Comments**	B-VIRUS	OWNER
KOROR	M	11/11/2009	042-108-277	YES	RETURNED	NEG	JOSHUA EBERDONG
NGARCHELONG	F	11/11/2009	042-095-532	YES	RETURNED	NEG	MATTHEW TEBENGEL
NGATPANG	F	11/11/2009	042-091-816	YES	PTS	POSITIVE	SISIOR NGIRAREMIANG
NGATPANG	M	11/11/2009	042-097-054	YES	RETURNED	POSITIVE	IRENE MIRA
PELELIU	F	11/11/2009	NO MICROCHIP	NO	PTS	NEG	NOBORU MADRIS
KOROR	F	11/12/2009	042-085-265	YES	RETURNED	NEG	QUINTA PASQUAL
KOROR	M	11/12/2009	421-115-639	YES	RETURNED	NEG	ALU CHAN
ANGAUR	M	B-test 11/15/2009	NO MICROCHIP	NO	collected blood only	NEG	
ANGAUR	M	B-test 11/15/2009	NO MICROCHIP	NO	collected blood only	NEG	

** PTS = Put to Sleep (euthanized); RETURNED= Returned to owner

ATTACHMENT 4:

Table of Euthanized Macaques

State	Hamlet	Gender	Euthanized Date
KOROR	IYEBUKEL	F	11/9/2009
KOROR	MADALAI	F	11/10/2009
KOROR	MADALAI	F	11/10/2009
KOROR	MADALAI	M	11/10/2009
KOROR	MADALAI	F	11/10/2009
KOROR	NGERBODEL	F	11/11/2009
AIRAI	KED	F	11/11/2009
AIMELIIK	IMULL	F	11/12/2009
AIMELIIK	SECHERSOI	F	11/12/2009
NGATPANG		F	11/12/2009
PELELIU	KOSKA	F	11/11/2009

Please provide the following information where relevant

- Hectares Protected: N/A
- Species Conserved: N/A
- Corridors Created: N/A

Describe the success or challenges of the project toward achieving its short-term and long-term impact objectives

The project was very successful in identifying, tagging and sterilizing all captive macaques outside the island of Angaur in Palau. This accomplishment is essential to preventing the spread of macaques outside of Angaur to other areas of Palau, thereby contributing to the long-term objective of protecting the biodiversity of 13 states in Palau (excepting Angaur and the SW Island states).

Were there any unexpected impacts (positive or negative)?

There were no unexpected impacts.

Lessons Learned

Describe any lessons learned during the design and implementation of the project, as well as any related to organizational development and capacity building. Consider lessons that would inform projects designed or implemented by your organization or others, as well as lessons that might be considered by the global conservation community.

Project Design Process: (aspects of the project design that contributed to its success/shortcomings)

The success of sterilizing the breeding population of captive macaques in Palau outside of Angaur state was highly dependent upon the prior survey of existing macaques conducted in 2009 by the Palau Conservation Society. The thoroughness of the sterilization process was therefore highly dependent on several factors, some of which were not directly done by this project.

The initial macaque survey of captive animals needed to be accurate; otherwise confusion would arise during scheduling and implementation. Information from this prior macaque survey was successfully used to locate most captive macaques. The community also needed to be well-informed through public education before and at the time of surgeries so that any animals missed in the initial survey would be made available for surgery.

Project Implementation: (aspects of the project execution that contributed to its success/shortcomings)

While support by individuals with pet macaques regarding their sterilization ranged from indifferent to positive, the existence of the Sterilization Order with penalties for non-compliance was critical to insure participation. A voluntary system without penalties would have been much less thorough. At the same time, the public awareness before and during the clinic did locate four additional macaques that had been missed during the prior year's survey.

Having knowledgeable veterinarians, experienced in all aspects of macaque behavior and medical care, was essential to the project's success, as it allowed rapid and effective processing of animals. The vets participated in the collection of most macaques from the owner's homes and they were able to provide significant comment and owner education on the need to sterilize the animals, in addition to providing help with the health and welfare of these captive animals.

All sterilized macaques were microchipped with a unique identification number, and all owners were given a Sterilization Certificate to document compliance with the BOA Sterilization Order. If follow-up to the sterilization clinic is undertaken by BOA, the spay/neuter certificate and microchip for each sterilized monkey will allow any new migration of monkeys from Angaur to be detected.

Sustainability/Replicability

Summarize the success or challenge in achieving planned sustainability or replicability of project components or results.

To our knowledge, all macaques outside of Angaur have been sterilized. This status is sustainable as long as new individuals are not transported outside of Angaur into other states of Palau. The prevention of introductions of unsterilized animals will only be feasible through coordinated actions between the Bureau of Agriculture and the Angaur state government.

It is important to remind the community regularly of the importance of not transporting these animals outside of Angaur. This requires a coordinator for the Palau BOA National Invasive Species Committee, a position currently not filled.

Safeguard Policy Assessment

Provide a summary of the implementation of any required action toward the environmental and social safeguard policies within the project. N/A.

Performance Tracking Report Addendum

CEPF Global Targets (01 January 2009 – 31 August 2009)

Provide a numerical amount and brief description of the results achieved by your grant. Please respond to only those questions that are relevant to your project.

PROJECT RESULTS	Provide your numerical response for re-sults achieved during the annual period.	Provide your numerical response for project from inception of CEPF support to date.	Describe the principal results achieved from 1 January 2009–31 August 2009.
1. Did your project strengthen management of a protected area guided by a sustainable management plan? Please indicate number of hectares improved.		N/A	
2. How many hectares of new and/or expanded protected areas did your project help establish through a legal declaration or community agreement?		N/A	
3. Did your project strengthen biodiversity conservation and/or natural resources management inside a key biodiversity area identified in the CEPF ecosystem profile? If so, please indicate how many hectares.		N/A	
4. Did your project effectively introduce or strengthen biodiversity conservation in management practices outside protected areas? If so, please indicate how many hectares.		N/A	
5. If your project promotes the sustainable use of natural resources, how many local communities accrued tangible socioeconomic benefits?		N/A	

Additional Comments/Recommendations

This project was a necessary first step that was successful in achieving its goals to sterilize the captive macaques in Palau outside of Angaur state. The follow-on activities, ie. the control of macaques on Angaur Island, is of course a much more difficult goal. It will require careful planning with regard to the methods used to carry out the work, and regular adaptive review of progress and adjustment of methods as needed. There is a strong need for knowledgeable, experienced upper management based in Palau, such as the coordinator position for the National Invasive Species Committee (NISC) which is presently an unfilled position.

Public awareness during this project was a success, to the credit of Dr. Joel Miles. The momentum of his program, thru the Palau National Invasive Species Committee, should not be lost.

Information Sharing and CEPF Policy

CEPF is committed to transparent operations and to helping civil society groups share experiences, lessons learned, and results. Final project completion reports are made available on our Web site, www.cepf.net, and publicized in our newsletter and other communications.

Please include your full contact details below:

Name: Lori Colin/Joel Miles

Organization name: Palau Animal Welfare Society

Mailing address: P.O. Box 1765, Koror, Palau 96940 Republic of Palau

Tel: (680) 488-5255

Fax: (680) 488-5513

E-mail: crrf@palaunet.com

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