

CEPF FINAL PROJECT COMPLETION REPORT

Organization Legal Name:	The University of Queensland
Project Title:	The emperor, the king and the little pig: status of the lost rats of Guadalcanal
Date of Report:	January 2016
Report Author and Contact Information	Tyrone Lavery tyrone.lavery@uq.edu.au

CEPF Region: East Melanesian Islands

Strategic Direction: Strategic Direction 3. Safeguard priority globally threatened species by addressing major threats and information gaps. Investment priority 3.1: Conduct research on the following five globally threatened species, for which there is a need for greatly improved information on their status and distribution: Makira Moorhen; Beck's Petrel; **Guadalcanal Rat; Emperor Rat; and King Rat.**

Grant Amount: USD\$ \$19,796

Project Dates: 2015/01/01 to 2016/12/30

Implementation Partners for this Project (please explain the level of involvement for each partner):

Solomon Islands:

Landowners at Kongulai and Valevahalo were involved in all stages of the project – assisting with choosing the locations for camera traps, setting and maintaining the traps and collecting/interpreting the images.

Josh Kera and Noelyn Biliki (Uluna Tribe) are Uluna tribal leaders (landowners of montane Guadalcanal) and coordinated the participation of Uluna tribe members and access to field sites.

Australia:

Dr Tyrone Lavery is a postdoctoral researcher at The University of Queensland. Tyrone led the project, chose survey sites, set and maintained cameras, processed and analysed images.

Conservation Impacts

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

The East Melanesian Islands hotspot supports remarkable mammal diversity and endemism. This fauna is also severely threatened. Over 52% of the vertebrates listed as priority species in the EMI ecosystem profile are mammals.

The primary aim of this project was to establish whether three of these priority mammals (Guadalcanal's endemic *Uromys* rodents) survive on the island. We aimed to do this by using baited camera traps set in transects at a number of elevations from sea level to montane forest. Two of these rodents (*U. porculus* and *U. imperator*) are already believed extinct. The third (*U. rex*) is poorly known, rarely encountered and at significant risk of extinction.

Locating viable populations is urgent. Guadalcanal is undergoing rapid environmental change. Commercial logging and conversion to oil palm plantation threaten the only known areas from which these three species have been scientifically documented.

This project has successfully undertaken the largest ever survey for Guadalcanal native rodents. We placed **25 cameras** in arboreal and ground positions in transect at two sites (Kongulai 300–400m, and Valevahalo 900–1100m above sea level). We also placed a third transect of **11 cameras** as extra effort outside this project (Chupukama 1300–1500 m asl).

Our efforts recorded **44,245 images** from across the two primary locations. Among these images we identified **19 species** of vertebrate (Table 1).

Table 1. Vertebrate species recorded in Camera trap surveys

Common Name	Species Name	Individual Record Count
Feral Cat	<i>Felis sylvestris</i>	197
Wild Pig	<i>Sus scrofa</i>	141
Melanesian Megapode	<i>Megapodius eremita</i>	74
Pacific Rat	<i>Rattus exulans</i>	74
Buff-headed Coucal	<i>Centropus milo</i>	51
Emerald Dove	<i>Chalcophaps indica</i>	30
Wild Dog	<i>Canis lupus familiaris</i>	13
Nankeen Night Heron	<i>Nycticorax caledonicus</i>	13
Mangrove Monitor	<i>Varanus indicus</i>	13
Northern Common Cuscus	<i>Phalanger orientalis breviceps</i>	7
Bronze Ground Dove	<i>Gallicolumba beccarii</i>	6
Black Rat	<i>Rattus rattus</i>	2
Nicobar Pigeon	<i>Caloenas nicobarica</i>	2
Solomon Eagle	<i>Haliaeetus sanfordi</i>	1
White-billed Crow	<i>Corvus woodfordi</i>	1
Golden Whistler	<i>Pachycephala pectoralis</i>	1
Variable Goshawk	<i>Accipiter hiogaster</i>	1

We recorded the presence of one of the lost rats of Guadalcanal (likely *Uromys rex*) through the recognition of feeding signs in an area of lowland forest on northern Guadalcanal. This project thus now provides an opportunity to implement conservation actions to safeguard one of the EMI ecosystem profile priority mammals.

Our cameras provided invaluable conservation data on the main threats faced by native rodents. Feral cats (previously suspected as the most likely cause of extinction of *U. porculus*, *U. imperator*, Choiseul crested pigeon and Makira moorhen) were by far the most commonly recorded vertebrate species.

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

1. Record of one of the target *Uromys* species

This project has documented the first signs of *Uromys* rats since Professor Tim Flannery surveyed Guadalcanal in the early 1990's. We were able to confirm the presence of one of the three species on northern Guadalcanal via feeding signs.

Across the Solomon Archipelago, landowners consistently report that ngali nuts (*Canarium indicum*) are the main food source for native rodents. Through work completed in 2016 on Bougainville, Malaita and Guadalcanal, I have now been able to build data on the techniques used by different rodents to eat these nuts. On Bougainville we were able to capture two individual *Solomys salebrosus* and from their den tree collected over 100 ngali nuts that had eaten.

On Malaita our team positioned camera traps at the base of a ngali nut tree and created piles of nuts in front of the camera. The cameras repeatedly recorded black rats (*Rattus rattus*) visiting the pile of nuts and eating them in front of the camera.

From these two data sources I have identified a simple but cunning (and previously unknown) method to determine which species of rodents are present near ngali nut groves. We collected nuts from northern Guadalcanal confirming the presence of a *Uromys* species in the area. However, this evidence does not indicate which of the three species it is (or discount the possibility of a fourth undescribed species).

I believe it is most likely evidence of the king rat (*Uromys rex*). The king rat is arboreal and therefore less likely to be affected by the high densities of feral cats we recorded during our camera trap surveys. **The area where we made this discovery is earmarked for logging in the near future.** We therefore recommend that follow up conservation work be initiated urgently in order to confirm the identity of these rodents and safeguard the population against immediate threats.



Fig 2. Locations of survey sites and recorded sign of *Uromys* sp. Guadalcanal

2. Appreciation of the role of feral cats in species extinctions

Prior to this project it was suspected that feral cats were the cause of a number of species extinctions in Solomon Islands, including:

- Guadalcanal rat (*Uromys porculus*)
- Emperor rat (*Uromys imperator*)
- Choiseul Pigeon (*Microgoura meeki*); and
- Makira moorhen (*Pareudiastes silvestris*)

This project has provided overwhelming support for the role of feral cats in species extinctions. Cats were the most commonly recorded animals at both sites (**197 individual camera events**). They were also active throughout the 24 hour cycle (**Fig. 2**).

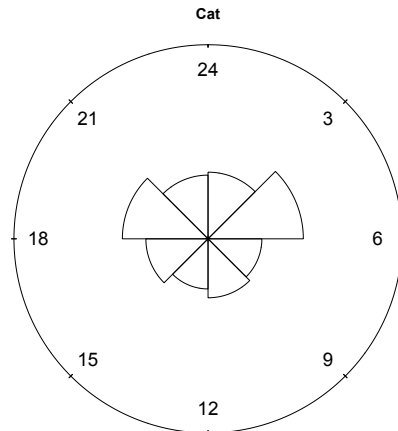


Fig 2. Activity pattern for cats on Guadalcanal. They were active 24 hours a day with peaks at dawn (3 – 6 hrs) and dusk (18 – 21 hrs).

There was overlap in the activity patterns of feral cats and Pacific rats (*Rattus exulans*) (**Fig. 3**) indicating rodents may form a significant part of cat diets in Solomon Islands. No rat predation events were captured on camera; however, on two occasions cats were recorded feeding on native frogs.

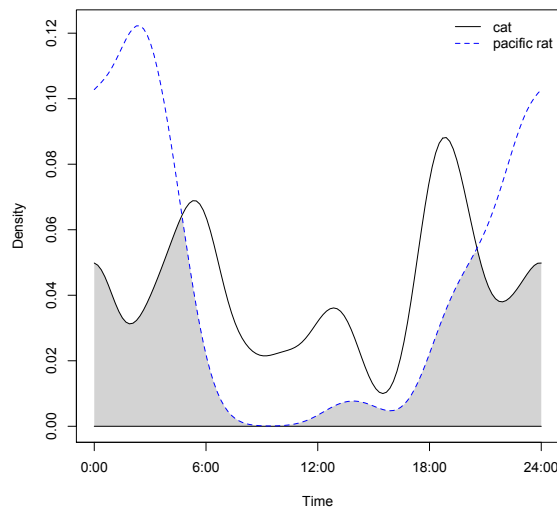


Fig 3. Activity patterns for cats and Pacific rats on Guadalcanal over a 24 hour cycle.

Hectares Protected:

Species Conserved:

Corridors Created:

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

This project has successfully achieved its short-term aim of providing an update on the status of Guadalcanal's *Uromys* rodents:

- *Uromys* rats are still present on northern Guadalcanal (most likely *U. rex*)
- *U. porculus* or *U. imperator* were not detected on the cameras and it remains likely these two species are extinct.

The long-term conservation impacts of this project will now depend on securing additional funding. There is an opportunity to confirm which species of *Uromys* remains extant on Guadalcanal, and implement some actions for this species' conservation.

In addition to this, the project has generated some long-term benefits by greatly informing the best methods to use for rodent surveys in Solomon Islands - our detection of *Uromys* was not achieved using camera traps as was intended. Through a series of field trips conducted in 2016 to Bougainville, Malaita and Guadalcanal I have now developed a far more advanced knowledge of Solomon Islands rodents than prior to this project. Should I have the opportunity to conduct a similar survey, I would still use camera traps as the main method to survey rats but would change how I position them in the landscape.

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)

Working with communities with whom I already had established relationships and an ability to successfully work remote locations were keys to success. Enabling local guides to lead field trips and decide where to place camera traps was invaluable. Solomon Islanders are superior at reading the landscape and detecting signs of different wildlife. They were also very wary of placing traps in positions where they might be found and stolen by people not involved in the project. No camera traps were tampered with during these surveys.

The project was partly designed to provide employment for USP masters graduate Corzzierrah Posala. This did not eventuate, but for good reasons. Corzzie instead took up full-time employment with the Solomon Islands Community Conservation Partnership (SICCP). Corzzie was however able to join some of the field trips to Kongulai and learn additional survey techniques (the use camera traps).

Ideally it would have been great to employ another graduate; however, the project had already been initiated and at that time I was not aware of any other graduates who may have been suitable, and were not already engaged in other activities.

I have now identified another suitable person – Guadalcanal local Kevin Sese who may be able to lead any future projects related to the conservation of Guadalcanal's mammals.

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

The Valevahalo site was extremely remote. I originally targeted this area as I was able to combine setting the camera traps with a USP led biological survey of the Guadalcanal highlands. This survey had helicopter support that made carrying the heavy equipment into the remote site much easier.

Returning to Valevahalo proved much more difficult. Access was restricted by landowners for reasons that were unrelated to this project. Returning to the site was also difficult as only a limited number of people were familiar with the trail. On one occasion we hiked half way to wait for our guide, who after two days did not arrive to meet us. This resulted in the loss of 5 days work and a significant portion of the budget to pay guides, porters and field rations. As a result, we were unable to access the cameras at Valevahalo for 14 months after setting them and were unable to change their positions to target other suitable sites.

However, I am happy we chose to survey Valevahalo. Data from this site have demonstrated that cats are in high densities even in areas of Guadalcanal that are remote from villages.

Other lessons learned relevant to conservation community:

Additional Funding

Provide details of any additional funding that supported this project and any funding secured for the project, organization, or the region, as a result of the CEPF investment in this project.

Donor	Type of Funding*	Amount	Notes
Australian Museum Research Institute Expedition Fellowship 2014–2015	B	\$USD7150	Salary for Dr Tyrone Lavery for work on community conservation projects in Solomon Islands
Australian Museum Research Institute Expedition Fellowship 2015–2016	B	\$USD7150	Salary for Dr Tyrone Lavery for work on community conservation projects in Solomon Islands
Fondation Segre	B	\$USD12,986	Field expenses for Tyrone Lavery and local partners for work on further community conservation projects in the Solomon Islands

****Additional funding should be reported using the following categories:***

- A Project co-financing (Other donors or your organization contribute to the direct costs of this 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 funded project.)*
- C Regional/Portfolio leveraging (Other donors make large investments in a region because of CEPF investment or successes related to this project.)*
- D In-Kind contributions can include staff and volunteer time, supplies, and other materials your organization provides to the project.*

Sustainability/Replicability

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

Guadalcanal landowners guided all surveys and the project attracted great interest. Communities became really engaged when processing the camera trap images. Time spent in villages viewing camera trap images has improved awareness of biodiversity. By working with local rangers during the fieldwork I have been able to train them to use camera traps.

Landowners were generally interested to see the types of animals and the frequency with which they were recorded in their area. The species of greatest interest were typically those that were of some relevance to livelihoods (e.g. wild pigs and hunting dogs). Viewing the images also motivated people to conserve their bush (especially when the most common thing seen were feral cats).

The project demonstrated the possibilities of alternative sources of income for project participants. Northern Guadalcanal has an extended history of incomes being derived from more environmentally destructive practices – logging, mining and palm oil. Project participants frequently conveyed that the project activities provided a really enjoyable form of employment that was superior to working for a logging or mining company. We discussed possible flow on projects, including one targeted towards mammal conservation and these ideas were eagerly supported.

Summarize any unplanned sustainability or replicability achieved.

Safeguard Policy Assessment

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

I used community forums and discussions with community leaders to monitor local opinion, and positive and negative outcomes of the project. I consulted extensively with partner communities during the planning and work phases. All discussions were held Solomon Islands pidgin. In meetings participants were free to express their views, and were therefore not dominated by project proponents or certain sections of community. Copies of the results of these surveys (camera trap images) were given to Uluna tribal representative Josh Kera.

No anticipated or unanticipated environmental or social safeguard issues arose during this period.

I proposed a continuation of this work aimed at conserving Guadalcanal's endemic rodents at the site where we detected *Uromys* in these surveys. The responses to this idea were very positive.

Additional Comments/Recommendations

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:

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*****If your grant has an end date other than JUNE 30, please complete the tables on the following pages*****

Performance Tracking Report Addendum

CEPF Global Targets

(Enter Grant Term)

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	Is this question relevant?	If yes, 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 July 1, 2007 to June 30, 2008. (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.	NO			
2. How many hectares of new and/or expanded protected areas did your project help establish through a legal declaration or community agreement?	NO			
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.	YES	363,032	363,032	Records of IUCN threatened species (<i>Uromys rex</i>) in the Guadalcanal Watersheds KBA, has strengthened and further justified biodiversity conservation in this area. The area is yet to be formally recognized as a Protected Area under Solomon Islands legislation.
4. Did your project effectively introduce or strengthen biodiversity conservation in management practices outside protected areas? If so, please indicate how many hectares.	YES	363,032	363,032	Records of IUCN threatened species (<i>Uromys rex</i>) in the Guadalcanal Watersheds KBA, has strengthened and further justified biodiversity conservation in this area. The area is yet to be formally recognized as a Protected Area under Solomon Islands legislation.
5. If your project promotes the sustainable use of natural resources, how many local communities accrued tangible socioeconomic benefits? Please complete Table 1 below.	NO			

If you answered yes to question 5, please complete the following table

