

### The Rufford Foundation Final Report

Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in word format and not PDF format or any other format. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

### Josh Cole, Grants Director

Grant Recipient Details	
Your name	Prosper Umuntunundi
Project title	'Non-primate mammalian wildlife abundance and distribution in Africa's youngest national park — Gishwati - Mukura NP in Rwanda'.
RSG reference	20936-1
Reporting period	13/1/2017-13/1/2018
Amount of grant	£4962
Your email address	umupros@gmail.com
Date of this report	15 <sup>th</sup> May 2018



1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Determine the presence and relative abundance of the non- primate ground- dwelling mammals of Gishwati-Mukura National Park.				Over the period April 2017 to April 2018 field work was carried out in Gishwati-Mukura NP, Rwanda. I found six non-primate species (African palm civet (Nandinia binotata), Carruther's mountain squirrel (Funisciurus carruthersi), Emin's giant pouched rat (Cricetomys emini), large-spotted genet (Genetta maculata), serval cat (Felis serval) and side-striped jackal (Canis adustus) at 63 independent sites. Emin's giant pouched rat is the most common found in the study area accounted for 41% of images recorded, followed by large-spotted genet 20%, serval cat 13%, side-striped jackal 13% and the least species recorded is African palm civet 1%.
Determine species occupancy, detection probability, and diversity indices of the non-primate mammals of ground dwelling mammals of Gishwati- Mukura NP.				I have used programme presence version 12.10 (found on this link https://www.mbr pwrc.usgs.gov/software/presence.ht ml) and single season model. I compiled frequency (Mukura and Gishwati combined frequency) of different species to calculate species occupancy, detection probability and diversity indices. There was no consistent pattern in species occupancy and detection probability except for serval cat and side striped jackal. The African palm civet had the lowest species occupancy and detection probability ( $\psi$ =0.02, p=0.13). Carruther's mountain squirrel had low species occupancy and relatively high detection probability ( $\psi$ = 0.17, p =0.42). Emin's giant pouched rat had the highest species occupancy and detection probability ( $\psi$ = 0.59, p=



	0.77) Large-spotted genet had
	moderate species occupancy and
	high state stige and skilling (m. 0.20 m
	nign detection probability ( $\psi$ = 0.29, p
	=0.53, Serval cat and side-striped
	jackal had moderate species
	occupancy and relatively high
	detection probability ( $\psi$ = 0.19, p=
	0.44) Despite the species occupancy
	and detection probability variations of
	the first four non primate mammals
	the first four non-primate manimals
	species of Gishwati-Mukura National
	Park, there was a similar significant
	difference (< 0.005) in all species
	distribution of the study area. African
	palm civet occupancy and detection
	probability being low, this may be
	explained by the fact this species is
	rarely found or underrepresented in
	the study area. The species
	accurancy detection probability
	and diversity index of Emin's giant
	pouched rat was higher. In other
	words the community of this species
	may be lacking enough predators to
	feed on them. The Cape genet was
	the second frequently encounter
	species and diverse. While both serval
	cat and side striped jackal species
	their species occupancy and
	detection probabilities were equal
	Therefore the small sample sizes give
	not conclusive result of the non-
	primate mammals' distribution in
	Cichwoti Mukuro ND The Eminia signal
	GISHWAU-IVIUKUIA INP. THE EMIN'S GIANT
	pouched rat had the highest diversity
	Index, followed by Cape genet, serval
	cat and side-striped jackal,
	Carruther's mountain squirrel and
	African palm civet was the less diverse
	species found in the study area.

## 2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

The difficulties arose during the project are theft of one camera and vandalism of one camera. This difficulty was handled by educating people around the study area about wildlife species and their importance in the ecosystem.



### 3. Briefly describe the three most important outcomes of your project.

I found four small to medium sized carnivores (African palm civet, Cape genet, serval cat and side-striped jackal) but the following expected species (the bush pig, black fronted duiker, southern tree hyrax, African golden cat, Wayne's duiker, blue duiker, yellow-fronted duiker, bushbuck, forest buffalo, Bates' pygmy antelope, giant forest hog and leopard) were not found during this project execution. This may indicate the extinction of the expected missing species. The absence of many of the expected species in the study area is linked mainly to habitat loss and poaching by local community. Therefore, the Rwanda Environmental Management Authority (REMA), Rwanda Development Board, the Department of Tourism and Conservation and the local community around Gishwati-Mukura NP are called to work closely together, in order to prevent the reduction/extinction of the wildlife remaining species of the study area. The park authority, REMA and RDB if possible find ways of re-introducing those non-primate mammal species and other studies of this kind can be undertaken to better understand the species occupancy, distribution and diversity of the non-primate mammals of the study area. I found six species in Gishwati-Mukura NP and except the African palm civet that was only recorded in Gishwati.

I have used some days around the study area educating local people and raising awareness of wildlife mammals in Gishwati-Mukura National Park.

The camera traps in the field during operation there were not selective, i.e.: a part from the non-primate mammal species recorded by camera traps. Other different taxon of primates and birds were also recorded during this project execution.

### 4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

Local people around Gishwati-Mukura NP, the Gishwati-Mukura NP authority, the Rwanda Development Board, and the Forest of Hope Association got aware about wildlife species found in Gishwati-Mukura National Park and their importance in the ecosystem.

Though some cameras were being disturbed or stolen, local people around Gishwati-Mukura NP got to know in depth the use of camera traps in nature conservation.

During this project execution, two community members (Nsanzimana Leonidas and Uwimana Pascal) volunteered to manage camera trapping grids. Due to their local knowledge of the forest and the geography I asked them to assist. In future, if possible these volunteers will work with I to develop a kind of community based monitoring scheme.



#### 5. Are there any plans to continue this work?

Yes, I do have plans to continue this work. The first grant has enabled me to be more familiar with the sampling technic. In the future I am planning to incorporate more environmental parameters/objectives and work with local people outside the protected area.

#### 6. How do you plan to share the results of your work with others?

The result of this project is soon planned to be presented in a monthly workshop at the University of Rwanda, Centre of Excellence in Biodiversity and Natural Resources Management. Also I am about to print and distribute the already prepared informative brochure on the awareness of non-primate mammals to the local community around Gishwati-Mukura National Park, to the Rwanda Environmental Management Authority (REMA), the Rwanda Development Board (RDB), and the Rwanda Department of Tourism and Conservation. I am also planning to share the findings of this project with Chris Roche of Rwanda Mammals Atlas. After the submission of this final report, I will work on a manuscript draft which will be submitted for publication in a peer reviewed journal.

### 7. Timescale: Over what period was the Rufford Foundation grant used? How does this compare to the anticipated or actual length of the project?

I received the Rufford Foundation grant in January 2017 and used it for a period of 12 months starting from April 2017 to late April 2018. I have made slight changes to the proposed timeline because of certain circumstance already mentioned above.

However, I have successfully conducted and completed all scheduled activities as proposed in the grant application.

## 8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.

Item	Budgeted Amount £	Actual Amount £	Difference £	Comments
16 camera traps (Ltl Acorn	2400	2400		
0310)				
16 Ltl Acorn security Boxes	400	400		
16 cable locks	256	256		
4x6 lithium batteries	640	240	400	I bought less batteries as anticipated
18 memory cards (32GB)	306	306		· · ·



Transport to camera trapping sites	160	160		
Taxes for camera import	306	706	-400	I did not expect that I would pay such money at the customs. But I paid taxes for camera import from £ 306 for transport to snail sampling and £ 400 remaining from the batteries.
Accommodation near Gishwati NP (12 months)	600	600		
Total	4962	4962		

### 9. Looking ahead, what do you feel are the important next steps?

I have completed my fieldwork in Gishwati and Mukura forest as proposed in my grant proposal. My next steps will involve mobilizing undergraduate students of the University of Rwanda, Department of Biology, Huye Campus to be part of the non-primate research team in Rwanda. I am also planning to establish a collaboration partnership with Dr Torsten Wronski from Liverpool John Moores University, Faculty of Science, School of Natural Sciences and Psychology where students from his institution may come to Rwanda for their fieldwork practical, and to conduct different research projects on the non-primate mammals of the Gishwati-Mukura NP.

# 10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did The Rufford Foundation receive any publicity during the course of your work?

In December 2017 I attended an RSG Conference in Uganda during which I presented my ongoing RSG-funded work. Moreover, in all my Gishwati-Mukura related communications to peers and other interested person and organisations used the RSG logo. I have also used the Rufford Foundation logo for the progress report submitted to the Rufford Small Grant foundation.

### 11. Please provide a full list of all the members of your team and briefly what was their role in the project.

**Prof. Ann Apio** served as project supervisor during this project planning and execution.

Mr. Prosper Umuntunundi served as the as the principal investigator.

#### 12. Any other comments?

I am deeply grateful for the support of the Rufford Foundation. Without funding from a Rufford Small Grant, this project would not have been possible.