

## The Rufford Foundation

### Final Report

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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](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

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Grant Recipient Details	
<b>Your name</b>	Dr Ryszard Oleksy
<b>Project title</b>	The Impact of Mauritian fruit bat ( <i>Pteropus niger</i> ) on commercial fruit farms
<b>RSG reference</b>	14099B
<b>Reporting period</b>	August2014-May2015
<b>Amount of grant</b>	£12000
<b>Your email address</b>	bzrzo@bristol.ac.uk
<b>Date of this report</b>	28 May 2015

**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
GPS tracking		x		So far six bats have been tagged with GPS devices and there are still another four devices to use. This has been a groundbreaking study in that the foraging locations of the bats are visualised directly on Google Earth within 24 hours of this occurring (see associated figure 1.).
Survey in Fruiting orchards		x		Two orchards were monitored (mango and litchi) however it will be essential to monitor more orchards next fruiting season for replication
Interview with stakeholders	x			Due to logistical reasons and the complexity of the study this objective was not met and should be covered next season
Bat counts	x			Not achieved due to logistical reasons and will be covered next season
Role of bats in forest ecosystem		x		Seed of two <i>Ficus</i> species were germinated on petri dishes: next step will be to germinate seeds from more species in a range of semi-natural conditions
Feeding trials on captive bats		x		Three trials were conducted, however more data are necessary to better inform gut retention time estimates

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

Not all of the funding that was applied for from other donors was granted and thus most of the objectives were only partially met due to complexity of the study and insufficient resources. However I obtained an abundance of pioneering results on *Pteropus* foraging behaviour that provide new insights and will direct what the project should focus on in the final phase of this important study.

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

The project is providing ground-breaking data about *Pteropus* foraging movements (Fig.1). This is the first study to monitor fruit bats in such detail and over such a long period. The GPS fixes from each tagged bat for each night were transmitted to my laptop via the mobile phone network, where they appeared on a Google Earth map. Two bats returned fixes over more than 4 months (one bat is still continuing to return data). The saturated mobile phone coverage in Mauritius, and the roosting of the bats in sunlit conditions (to recharge the tags' solar cells) means that data can be returned at high spatial and temporal resolution over long time periods: I know no other study where such long-

term, high resolution data have been obtained for bats. So far it is clear that the bats are ranging over much of the island, roosting mainly in isolated forest fragments that suffer little disturbance, and feed in a range of sites including fruit trees in gardens, natural forest fragments and orchards. Bats occasionally move >40 km in a night and may revisit the same feeding site over several weeks. So far over 12 roost sites have been found. Although the feeding site data have yet to be analysed, it is clear that the bats are spending a considerable amount of time foraging at sites other than fruit plantations, though repeated visits to specific orchards do sometimes occur.

In terms of bat-fruit conflict in Mauritius, the study showed that on average the bats are responsible for around 10% of damage to fruiting plantations. Introduced birds may cause much more damage than previously thought, though more replication is necessary to confirm these initial findings. A lot of fruits observed on the trees are over-ripe and of no commercial value.

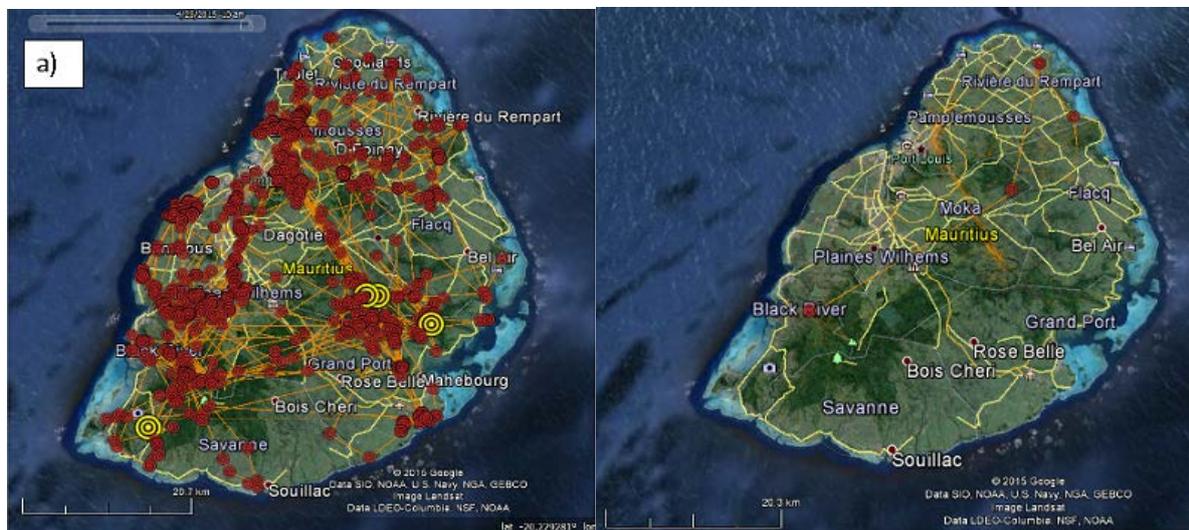


Fig.1. Movements of six tagged bats since December 2014 until May 2015 (a) and movement of one bat over a single night (b). Red dots indicate a fix taken by a GPS and yellow dots indicate roosting sites.

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

Local stakeholders were approached and granted permission for me to conduct work in orchards: they were informed about the outcomes of the project. Additionally, general information about the project was published in a national newspaper. The outcome of the study will be also published in the local newspapers.

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

It is essential to continue this project and meet all the stated objectives. It is planned to cover another fruiting season during 2015/2016 and finish the project in mid-2016. This would allow full use of the tags donated by Microwave Telemetry (value ca. £30,000) that can potentially continue to return long-term data.

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

The results of the project were presented to National Parks and Conservation Services in Mauritius. They will also be published in local newspapers as well as on Mauritian Wildlife Foundation website and Facebook page. Once fully analysed, the results will be published in peer-reviewed journals and presented on the International Bat Research Conference in Durban, 2016.

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

The grant was used between August 2014 and May 2015. The anticipated timescale was September 2013 to September 2014. However, due to unforeseen problems with getting government permission for the study, the project was delayed.

**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
Subsistence for the researcher	1800	1800		
Researcher's assistant	4520	4520		
GPS data transfer	1600	1600		
Mobile phone costs	140	140		
Accommodation	1000	1000		
CCTV cameras	500	500		
Head torches	70	70		
Pesola	20	20		
Binoculars	100	100		
Fuel	1250	1250		
Vehicle repairs	500	500		
Insurance	500	500		
<b>Total</b>	<b>12000</b>	<b>12000</b>		

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

It is crucial to continue the study and tag more bats, follow their movements over the next fruiting season and compare it to the non-fruiting season. I will complete a habitat selection analysis to determine how dependent the bats are on fruit orchards. I will provide a database of roost sites to the Mauritian Wildlife Foundation so that long-term monitoring of the species will be possible. It will be important to assess more orchards and test mitigation methods (including deterrents) to minimize the damage bats and birds may cause to the fruits.

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

The logo was used during various talks to Mauritian Wildlife Foundation as well as Ministry of National Parks and Conservation Services.