

The Rufford Small Grants Foundation

Final Report

Congratulations on the completion of your project that was supported by The Rufford Small Grants 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 | Ryszard Oleksy |
| Project title | The contribution of fruit bats to forest regeneration in Madagascar- do bat-processed seeds do better? |
| RSG reference | 11785-2 |
| Reporting period | August- November 2012 |
| Amount of grant | £6000 |
| Your email address | bzrzo@bristol.ac.uk |
| Date of this report | 22/01/2013 |

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 |
|------------------------------------|--------------|--------------------|----------------|--|
| Germination of bat processed seeds | | | Fully achieved | The seeds were germinated under several conditions (filter paper, soil with no invertebrates, normal soil and sterilised soil). The results indicate that bat-processed seeds germinate better than those from fresh fruits. |
| GPS tracking study | | | Fully achieved | 15 bats were tagged with GPS devices, recording in total 101 nights of data. The bats were traveling great distances- some over 50 km a night- which confirms their status as long-distance seed dispersers. The data are still under detailed analysis. |
| Gut retention time study | | | Fully achieved | Nine bats were captured and kept for three nights to monitor their gut passage and retention time. The data suggests that bats may retain the seeds for over 24 h in their gut. The data are still being analysed. |

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

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

- The bat-processed seeds showed better germination success when compared to seeds from fresh fruits.
- The GPS tracking study showed that bats are able to travel great distances at night and thus be long-distance seeds dispersers. In Berenty, bats feed predominantly on sisal pollen which is abundant all year round.
- Gut retention time study showed that bats may retain seeds in the gut for over 24h. This ability allows dispersal of seeds far from the maternal tree and in random directions.

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

The local community in Berenty was greatly involved in the project. They helped with day-to-day activities gaining not only short-term employment but also knowledge about the conservation status of the Malagasy forest and its inhabitants. They had opportunities to learn about the importance of bat protection, forest maintenance and sustainable harvest. They have used the seedlings produced during the study to plant around their villages and forest edges. At some point grown trees will be a source of food for several species of birds and mammals. They can also be used as fuel source for the community.

I have closely collaborated with Berenty Reserve management and organised a training session for local guides to provide important information about the bats' ecology and conservation status. This will allow guides to pass the information onto the tourist and school groups which very often visit the park.

Because the bats in Berenty are under decline and were highly disturbed by the groups of tourists, through collaboration with the management I have managed to close the path leading directly under the roost and organise a viewing point where bats can be watched from a distance with no disturbance. We have talked through a design of a viewing platform which is planned to be constructed in June 2013, which will be after the mating season and before the youngsters are born. This should minimize any disturbance.

Additionally, I have designed an information poster about Berenty's bats in English and French which will be placed on the entrance to the park, as well as a warning sign (in English, French and Japanese) placed on the closed path leading to the roost. All these should help to protect the roost at Berenty Reserve and minimize any human disturbance.

5. Are there any plans to continue this work?

The project is planned to continue in Autumn 2013. There are six retrieved GPS tags which once refurbished can be used to produce more movement data. Therefore, there are plans to tag additional bats in the rainy forest on the East of Madagascar where food sources are more scattered and seasonal. This may show different movement patterns than in Berenty where bats mainly feed on abundant sisal pollen. The reliability of the GPS tags and the quality of data obtained exceeded my expectations, and the method provides tremendous opportunities for understanding the movements of seed-dispersing bats at fine temporal and spatial scales.

Additionally, I would be interested in launching a long- term bat movement monitoring study using the Argos satellite system. This would allow me to track bats at lower resolution but for significantly longer period of times (at present movements of individual bats were documented for up to 2 weeks). The satellite tracking study would show seasonal movements of bats, identifying the most important feeding, roosting and breeding grounds and thus places where bats are most vulnerable to hunting pressure and human disturbance.

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

The results of this study will be presented on 16th International Bat Research Conference in Costa Rica, August 2013. Additionally, at least two papers based on the results of this study will be published in high impact journals.

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

The grant was used over a period of three months (August-October 2012) which is within the original project timetable.

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 |
|----------------------|-----------------|---------------|------------|--|
| Flight tickets | £1000 | £1000 | 0 | Planned amount of grant was used to purchase flights tickets and any excess prices covered by matching grants. |
| GPS devices for bats | £5000 | £5000 | 0 | Planned amount of grant was used to purchase GPS devices with any excess prices covered by matching grants. |
| Total | £6000 | | | |

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

My results will be fully analysed and will form a major component of my PhD thesis. The study is the first that I am aware of to use GPS tagging to describe habitat selection in any bat species. A long-term bat movement monitoring study using the Argos satellite system is an important next step (see 5 above). Additional GPS tagging in forest habitats away from the atypical sisal plantations at Berentry would make my findings more broadly applicable. Such results would help to produce new conservation programmes for Malagasy fruit bats which are still under a decline, threatened by local people and habitat degradation.

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

I have used the logo in a departmental presentation at Bristol and during a talk I gave at NGO Madagasikara Voakajy in Madagascar. I will also use it at the International Bat Research Meeting in Costa Rica, August 2013.

11. Any other comments?

I would like to thank Rufford for the second grant which allowed me to advance this study significantly and gather vital data about the bats' behaviour and the role they play in forest ecosystems.