

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	Dr Jayaraj Vijaya Kumaran
Project title	Determining the diversity, distribution and habitat of flying squirrels in Royal Begum State Park, Malaysia through community-based observation activities
RSG reference	27588-1
Reporting period	5 Mar 2019 – 4 Mac 2020
Amount of grant	£5000
Your email address	jayaraj@umk.edu.my
Date of this report	14 March 2020

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
A diversity and abundance data of flying squirrels in Royal Belum State Park, Malaysia. This will be the first comprehensive study focusing on flying squirrel diversity and abundance in Malaysia.				A total of five species of flying squirrels are known to occur in Royal Belum State Park.
Habitat preference of flying squirrels spotted in Royal Belum State Park including tree species, height and diameter at breast height.				A total of 10 tree species were found to be preferred by flying squirrels in Royal Belum State Park.
Distribution and ecology data on Data Deficient, Vulnerable, and Endangered flying squirrels in Royal Belum State Park.				We could only partially prepare the distribution data as the sightings were insufficient to provide conclusive evidence.
A Night transect survey activity that incorporates community engagement in sampling and data collection.				We were able to produce the module for this activity with the cooperation of the aborigines in the area.

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

There was a period of rainy season that hampered our sampling efforts. This was managed by camping in the sampling site with enough provisions for 2 weeks.

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

- a) We found that flying squirrels are habitat generalists but has specific tree heights that are used to build nests.
- b) We also found that flying squirrels utilise mineral deposits such as limestone caves.
- c) We also found that flying squirrels home range is 0.032 km² (red giant flying squirrel) and 0.0064km² (red-cheeked flying squirrel). The larger flying squirrels like red giant flying squirrel prefer trees with a height of 15m – 30m while

smaller flying squirrels like the red cheeked flying squirrel prefer trees that are shorter with approximate height of 10m.

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

The local community were able to learn how to spot, track and identify flying squirrels in the forests. We were also able to teach them how to use these skills to provide ecotourism activities for additional income.

5. Are there any plans to continue this work?

Yes, we also plan to expand this work to Taman Negara Malaysia, the biggest protected area in Peninsular Malaysia. We also plan to look into the nesting ecology and diet of flying squirrels.

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

We have already organised several talks and also shared our findings with The Department of Wildlife and National Parks (PERHILITAN). We also manage to publish a short communication on flying squirrels in Journal of Threatened Taxa during our trial phase of equipment testing. We also plan to further our cause by leveraging our success in this initial project phase with other potential funders.

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 mostly used for the first 9 months of the projects and was finalised at the end of the 12th month.

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
Travelling	300	300		The difference was due to fluctuating fuel price and also the unpredictable amount of land travelling that was later recalibrated with cheaper boat rides.
-fuel for 4WD vehicle	100	150	+50	
-fuel for boat	200	150	-50	
Workshop for trainers	600	600		

- Banners, posters, flyers and bunting printing	100	100		
-Food and beverages for workshop participants)	300	300		
-Basic field equipment for 15 participants	100	100		
-PA system and walkie talkie rental	100	100		
Field assistants and guides	200	350		
-Daily sustenance for volunteer field assistants	150	170	+20	We compensated the field assistant with additional 20 because of extra-long hours in the field due to rainy season.
-Field guides	50	50		
VHF collars and telemetry system	2500	2500		
-PERDIX VHF Tracking	832	832		
-PERDIX VHF Wildlife Tracking Receiver	1530	1530		
-PERDIX VHF Yagi Antenna	75	75		
-Hand Held Yagi Antenna Cables	20	20		
-Omni VHF Tracking Antenna	30	30		
-Custom made collars	13	13		
Other equipment	1400	1380		
-Nikon 200-500mm F/5.6E ED VR AF-S Nikkor Lens	800	780	-20	There was a sale and we manage to get cheaper lens.
Small mammal collars with tags	100	100		none
100m length strong nylon ropes	300	320	+20	We bought extra ropes for contingency.
Mist nets	50	50	50	none
-Design and printing of module	100	80	-20	We were able to get cheaper printing price.
-Lunar Red LED head lamp	50	50		
TOTAL	5000	5130	+130	*1 £ sterling = RM 5.306 exchange rate during the fund transfer date.

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

Our findings reveal the importance of tree height in the conservation of flying squirrels, which in turn also indicates that the age of a tree is important for the survival of flying squirrels in the tropical rainforests. We will continue to disseminate this information to initiate a continuation study on the effects of selective logging on the conservation of these mammals. We also plan to study in detail the nesting ecology of these elusive mammals and also their diet. This will shed light on the ecological role of these mammals in the tropical rainforests.

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?

Yes, we managed to share our findings in several local talks and also our Facebook posts, which we include all our posts with the Rufford logo. Our Journal of Threatened Taxa publication also included the Rufford logo in the paper. Our participation in the Rufford Conference in Universiti Sains Malaysia in January 2020 was also widely acknowledged by the top management of my university.

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

Dr Jayaraj Vijaya Kumaran as the principle investigator of this study, who planned and managed to overall project delivery. Dr Jayaraj also managed the permit acquisition of this study from the relevant authorities.

Mr Mohamad Nur Arifuddin bin Mad Yusof is the postgraduate student involved in the sampling and data collection of this study. He was also involved in the manuscript preparation and final report.

Mr Simon Ostermann is a volunteer scientist from Germany that joined us for a short stint to work on flying squirrels. He found out about our project from the info page about [in The Rufford Foundation https://www.rufford.org/projects/jayaraj_vijaya_kumaran](https://www.rufford.org/projects/jayaraj_vijaya_kumaran). He has since returned back to Germany to finalize his MSc and may return to join us for another stint in the future.

12. Any other comments?

We are very much thankful to Rufford Foundation for the grant awarded to my team as we were able to kick start our research on flying squirrels in Malaysia. We are also thankful for the publicity as we were able to get an international volunteer scientist to join our project.

Appendices



Red giant gliding squirrel, *Petaurista*



Spotted gliding squirrel, *Petaurista elegans*



Red-cheeked gliding squirrel, *Hylopetes spadiceus*



Temminck gliding squirrel, *Petinomys setosus*