

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	Rohit Naniwadekar
Project title	Impact of hunting on seed dispersal and recruitment in tropical forests of north-east India
RSG reference	10475-2
Reporting period	1 November 2011 – 31 October 2012
Amount of grant	£6000
Your email address	rohit@ncf-india.org
Date of this report	31 October 2012

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
Comparing hornbill abundances across disturbed (hunting and logging pressures) and undisturbed site (low hunting – no logging pressures)			Fully achieved	We had indicated that eight trails would be established across two sites, however, in the disturbed site, because of limited availability of area under forest, we could set up only four trails. In addition, we had indicated that each trail would be monitored on 25 occasions; however, with just 12 temporal replicates we were able to detect significant differences in hornbill abundances across the two sites.
Comparing frugivore visitation rates across the two sites.		Partially achieved		We were able to estimate frugivore visitation rates in the less disturbed site but not in the disturbed site. We faced logistical constraints during the field study as our trained field assistants were forced to stop working with us due to turmoil between the forest department and the local community. We had to train new assistants from a different community and therefore we were not able to fully complete this task at the less disturbed site
Comparing hornbill food plant densities across the two sites			Fully achieved	This objective was not stated in the original work plan but we felt important to estimate food plant densities across the two sites as logging additionally impacts the disturbed site. We were interested in determining how logging impacts hornbill food plant densities. We found significant differences in abundances of hornbill food plants which are logged but failed to find differences in hornbill food plants which are not logged.
Comparing seed arrival rates across the two sites			Fully achieved	The arrival rates of large seeds dispersed predominantly by hornbills were significantly lower in the disturbed site as compared to less disturbed site.

Comparing recruitment of select large-seeded plants predominantly dispersed by hornbills			Fully achieved	Overall densities of recruits lower in disturbed site in case of two of the four species. One species should significant interaction between disturbance and size-class distribution of recruits with the difference between abundance of small and large-sized recruits being significantly higher in disturbed site.
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2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant)

In Namdapha National Park, due to conflicting opinions and lack of consensus between the local Forest Department and one of the local communities, the Lisus, on resolving the problem of Lisu settlements inside Namdapha National Park, we encountered some problems which arose out of this conflict.

A few Lisu individuals had been employed by our organisation, Nature Conservation Foundation, for more than 8 years. Their knowledge about the wildlife, forests and our work was a valuable asset for us. However, they were forced by a section of their community to discontinue work with us. Thus, we had to employ individuals of other communities and had to train them afresh.

In addition, we and other wildlife researchers in the area were threatened while some researchers were physically assaulted by a section of the local community, as they did not want wildlife research to be conducted in Namdapha National Park. We were, therefore, forced to wrap up fieldwork earlier than intended. However, this happened towards the end of the field study and there was only minor loss in data collection.

Local people visiting the disturbed site occasionally removed our plots and their markings. We had to remark these damaged plots.

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

Our study demonstrated that:

- 1) Abundance of hornbills and their food plants in the less-disturbed Namdapha National Park was 22 and 2 times higher than in the neighbouring high-disturbed Miao Reserved Forest.
- 2) Scatter-dispersed arrival of large seeds predominantly consumed by hornbills was seven times higher in the less-disturbed site as compared to the high-disturbed site.
- 3) There were significant differences in abundance of recruits and differences in abundances of seedlings and saplings of one species of hornbill-dispersed important timber species were significantly higher in the high-disturbed site as compared to low-disturbed site.

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

We employed eight individuals across two different communities (Tangsa and Chakma), which live at the periphery of an important protected area in the region, the Namdapha National Park. They were initially sensitised about the wildlife found in the area, its importance and the need to conserve wildlife. They were subsequently trained in data collection.

5. Are there any plans to continue this work?

We wish to conduct telemetry studies to understand ranging patterns of hornbills at a site, Pakke Tiger Reserve, which is adjacent to vast human-modified (logged) forests. At that site we aim to understand the role of hornbills in seed dispersal and regeneration in disturbed forests. In addition, we also aim to conduct a wider region (north-east India) level survey for hornbills to identify sites (protected and non-protected areas), which still harbour significant populations of hornbills.

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

A manuscript describing the results of this work is in review in *Biological Conservation*. Thus, the findings of this study will be shared with the scientific community once the manuscript gets published.

In addition, most of the results of this work have been presented in three conferences already.

1. Annual meeting of Association of Tropical Biology and Conservation, Bonito, Brazil in June 2012,
2. Student Conference for Conservation Science, July 2012, Bangalore
3. Society for Conservation Biology, Asia Chapter, August 2012, Bangalore.

We hope to present the findings of this work in the upcoming Association for Tropical Biology and Conservation Meeting.

The results of this work are being summarised for a report that will be submitted to the Arunachal Pradesh Forest Department.

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 from November 2011 till present. It compares well with the actual length of the project as had been proposed in the original proposal.

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
Salary (1 research fellow @ UK£ 245 pm for 12 months)	1960	1960.01		
Salary (5 field assistants @ UK£ 55 pm per person for 12 months)	1980	1979.99		
Accommodation costs (@ UK£ 40 for 12 months)	480	479.99		
GPS (2 units of eTrex Venture® HC at UK£ 105 per unit)	105	105		
Rangefinder (2 units of Bushnell Yardage Pro® Sport™ 450 at UK£ 165 per unit)	165	164.99		
Rations (UK£ 20 per month for six months for 5 people)	500	500		
Travel (2 Round trips Bangalore-Dubrugarh-Bangalore)	215	215.01		
Local travel	300	300		
Mosquito nets	95	94.99		
Communication	100	100		
Miscellaneous	100	100		
Total	6000	5999.99		

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

As has been demonstrated by our study, regeneration of animal-dispersed plants can be impaired by loss of their dispersers. Hornbills are important dispersers for several large-seeded plants which otherwise have a limited set of seed dispersers as compared to small-seeded plants. Loss of hornbills can therefore have negative consequences for their regeneration.

In the context of north-east India, where the forests are increasingly getting degraded and fragmented it is important to understand firstly, impacts of these two threats on seed dispersers and then on regeneration of animal-dispersed plants. In addition, efforts are required to identify pockets which harbour populations of important animal groups like hornbills and then formulate solutions to minimize threats to these populations. At sites where such populations have already been identified the next step is to ensure persistence of these populations in the long run.

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?

RSGF logo was used in oral presentations delivered during Association for Tropical Biology Meeting, Bonito, Brazil, Student Conference for Conservation Science, Bangalore and Society for Conservation Biology, Asia meeting, Bangalore. In addition, RSG has been acknowledged for funding support in the manuscript submitted to Biological Conservation.