

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	Sneha Vijayakumar
Project title	Avian Frugivores – understanding determinants of distribution and diversity in the Western Ghats
RSG reference	9417-1
Reporting period	February 2011 to March 2012, extended to August 2012
Amount of grant	£5900
Your email address	snehav.16@gmail.com
Date of this report	May 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
Species distribution maps			+	We collected presence records for 156 bird species, among which 34 species are frugivores. These records were used to build species distribution maps using a combination of niche modelling and GIS techniques. These maps were prepared using the primary data collected, along with relevant environmental data to predict a more accurate distribution for each species. We hope to validate these distributions by visiting the predicted areas in the near future.
Factors influencing distribution of frugivorous birds		+		The important environmental factors that emerged as having an influence on the distribution of frugivorous birds in the Western Ghats are annual precipitation, elevation and normalised difference vegetation index. These are being validated with generalised linear models and the results will soon be submitted as a scientific paper.
Key plant-frugivore interactions	+			We have identified a number of fruit tree species that the frugivores of the Western Ghats feed on. Although our team surveyed a large number of sites, we were unable to collect detailed information on plant-frugivore interactions. We hope to take this project forward and carry out fruit tree watches to further understand these interactions.
Contribution to spatial database of species distribution in the Western Ghats		+		The presence records of all bird and plant species collected during this project, along with species distribution maps, will be added to an online spatial database of species distribution. This database is currently under construction.
Communication of project results and recommendations			+	a) During field work, our team informally spoke to the forest departments and local community about the importance of frugivores as seed dispersal agents, as well as

				<p>the need for conservation of the flora and fauna of the Western Ghats. Formal presentations were also made to forest department staff in a few protected areas.</p> <p>b) A bi-lingual poster on the role of frugivorous birds as seed dispersal agents, depicting commonly observed frugivores and fruiting trees in both deciduous and evergreen forests of the Western Ghats was made. This poster is being sent to all forest departments and local NGOs across Tamil Nadu, Kerala, Karnataka, Maharashtra and Goa.</p> <p>c) Detailed reports containing findings of the study and recommendations are being prepared and will be sent to forest department administrators.</p>
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2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

During this project, one of the biggest challenges we faced was finding suitable sites to carry out bird transects and vegetation plots across the Western Ghats. Both in terms of identifying stretches of relatively undisturbed forest as well as managing the logistics of sampling in that area, our team had to plan carefully in advance before finally collecting data in the site. In some areas, despite several inquiries and planning, we were unable to carry out our work due to logistic constraints and unexpected weather conditions. Overall, the project largely progressed as planned and all the objectives were at least satisfactorily achieved.

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

a) Species distribution maps - Accurate species distribution maps are important for conservation planning and to identify gaps in protected areas. Currently, the distribution maps that are available for birds in the Western Ghats are those present in field guides. We believe that these maps are not accurate representations of the distribution and do not bring out gaps in distribution clearly. Our team has prepared distribution maps for about 150 species of birds using primary field data. We used niche modelling and GIS techniques to make more accurate distribution maps, taking into consideration environmental factors as well. We plan to validate these maps by sampling further in the predicted areas.

b) Environmental factors influencing the distribution of frugivorous birds – The environmental factors that emerge as potential factors during the niche modelling analysis are annual precipitation, elevation and normalized difference vegetation index (NDVI). This is being further tested using generalised linear models. A number of studies across the world have shown that climatic factors influence plant distribution and hence, bird distribution patterns. This is the first study in the

Western Ghats to look at what factors influence the distribution of frugivorous birds. We hope to identify the specific climatic factors that influence the distribution of bird species in the Western Ghats and publish our results in a scientific journal.

c) Communication of project results – We plan to communicate the results of our project and create awareness about the ecosystem services provided by frugivorous birds through scientific papers, semi-technical reports as well as posters. The semi-technical reports contain information on bird and plant diversity in the area as well as threats identified and recommendations for conservation planning. These reports are being submitted to forest department offices in all the sites we visited. The bi-lingual posters on frugivorous birds and their role as seed dispersal agents are being distributed to forest administrators, NGOs and schools. The data collected during this project will also be submitted to an online spatial database of species distribution that is under construction. Scientific papers are also in preparation.

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

Our team was always accompanied by local forest department staff and tribals during our surveys in the different areas. They guided us through the forest and shared with us their local knowledge on birds and plants in the area. Some of them were more enthusiastic than others and spoke to us about how they could make a difference to wildlife conservation. Some, including Range Forest Officers and Deputy Conservators of Forests, were keen on learning and understanding the methodology we employed to collect data on birds and plants. We engaged with interested forest department staff, both formally and informally, in the hope that they would train their staff to continue the bird and plant surveys. We also hope to reach out to the local communities through the bi-lingual poster that has been produced as part of this project.

5. Are there any plans to continue this work?

Yes, we are definitely planning to continue this work. We intend to carry out further sampling in the sites that we were not able to survey as part of this project. We also plan to cross-validate species presences in areas predicted by the niche modelling analysis. This will help us further refine individual species distribution maps. We also propose to conduct focussed fruit tree watches in specific locations across the Western Ghats to understand fruit-frugivore interactions. This will help us gain an understanding about the local scale processes that could influence distribution patterns.

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

Poster - A bi-lingual poster on the role of frugivorous birds as seed dispersal agents, depicting commonly observed frugivores and fruiting trees in both deciduous and evergreen forests of the Western Ghats has been prepared. This poster has been made in four vernacular languages (Tamil, Malayalam, Kannada and Marathi) to create conservation awareness among a wider audience. The artwork was provided by Sangeetha Kadur, a wildlife artist and enthusiast based in Bangalore, and the poster layout was designed by Eric Arakel. Currently, the poster is being sent to all forest departments, local NGO's and schools across Tamil Nadu, Kerala, Karnataka, Maharashtra and Goa. Scientific papers and semi-technical reports - We are in the process of preparing at least two scientific manuscripts based on the findings of the project. One paper will be based on the factors influencing frugivorous species distribution in the Western Ghats and the next paper will evaluate bird species richness and plant species richness in sites across the Western Ghats. We hope to

submit these manuscripts to reputed international peer-reviewed journals. Detailed semi-technical reports containing findings of the study and recommendations are being prepared and will be submitted to forest department administrators.

Presentations - The team has made a few formal presentations about the project and the importance of frugivores as seed dispersal agents in protected areas for forest administrators. We hope to be able to present our work in the next International Symposium on Frugivory and Seed dispersal as well as other conferences.

Online database of species distribution - Our lab will be launching an online database with descriptions, locations, distribution maps and other information on frogs, snakes, lizards, birds and plants. The data collected on birds and plants through this project will also be part of this online database.

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

The funding was mainly used for field work from March 2011 to June 2012. More recently, the remaining funds were used to prepare conservation awareness posters. Since there are a number of questions yet to be addressed, we will be continuing the project in the hope of gaining a more holistic understanding of the importance of frugivorous birds in the Western Ghats.

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.

The exchange rate used is 1£ = Rs.72.16. This was the exchange rate when the funds were received.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Field assistant fellowship	1280	1210	70	
Food during fieldwork	800	538	262	We shared costs with other projects and cooked most meals that we ate, therefore overall costs for supplies worked out much cheaper than originally budgeted for.
Travel and local transport	100	244	-144	We travelled by bus to many more field sites than originally planned.
Vehicle hiring charges	2000	1621	379	Since we travelled by bus to many field sites, we did not always need to hire a vehicle. Also, we hired a vehicle only when we thought it was absolutely essential.
Telecommunication	120	0	120	We did not require a phone or internet connection because we had no access to network in most places.

Meetings and training	200	0	200	Most meeting and training sessions that were conducted were organised informally or by the forest department. Therefore, we did not spend any money here.
Publications	250	750	500	The bi-lingual poster made in four different languages constituted a big part of the budget. We had originally proposed to make booklets. But we felt that a poster with beautiful artwork and vernacular text helps us reach a wider audience. Some of the money was also used to print semi-technical reports for the forest administrators.
Postage	25	120	-95	We required more funds than earlier budgeted to send the posters to five different states.
Field equipment	1000	870	130	We bought all the equipment that we required, except a densiometer that we unable to source from the US at the time.
Hardware and computer supplies	75	47	28	
Stationary and office supplies	50	36	14	
Total	5900	5436	464	

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

First, the predicted species distribution maps should be validated with further sampling. This will help us prepare more accurate distribution maps that will aid in future conservation planning and identifying gaps in protected areas. Also, through detailed fruit tree watches, we plan to identify key fruit-frugivore interactions and important seed dispersal agents. Understanding these local scale processes is crucial to the survival of both the frugivorous birds as well the maintenance of the plant diversity in the Western Ghats.

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?

Yes, the RSGF logo was used in the poster on fruits and frugivores that was distributed to all forest department offices and other stakeholders. It was also used in all presentations and reports prepared in connection with this project. Further, the RSGF will be acknowledged on any publications that emerge from this project.



11. Any other comments?

I am very grateful to the RSGF for supporting my work and for being extremely patient and accommodating with all my requests. These funds were received at a crucial stage of the project and have been instrumental towards the completion of a major portion of this project.