

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	Malavika Hosahally Narayana
Project title	Embracing Elephant Behavioural Dynamics for Human Elephant Coexistence
RSG reference	8109-1
Reporting period	June 2010 to December 2011
Amount of grant	£5901
Your email address	malavika.hn@gmail.com
Date of this report	May 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
Identifying, characterising and mapping human elephant conflict hotspots for engendered Asian elephants in South India			✓	Forest department records for crop loss compensation, human death and injury cases and elephant death cases were collected and conflict hotspots for the Kodagu district were identified by the number of human-elephant conflict cases reported. In the identified study sites, elephant refuge areas, entry and exit points to crops were monitored with direct sightings and camera traps - using GPS locations to identify refuge hotspots in relation to the conflict hotspots for the region.
Developing a GIS database on elephant usage of the agricultural landscape			✓	GPS Locations for the elephants' presence were recorded to determine the frequency of individual elephants or group usage of the agricultural landscape which will be correlated with the reported and recorded levels of human elephant-conflicts within the district and study area.
Identifying elephant individuals/groups – to determine age and sex of “conflict” individuals as well as ranging			✓	Camera traps were installed in different estates to identify elephant individuals / groups that entered into coffee estates. Eight camera traps were installed in different parts of the study estates according to previous and current use of these locations by the elephants.
Knowledge sharing, community interaction and awareness to reduce human – elephant conflict and to initiate mitigation activities and the development of management strategies			✓	During field work, constant interaction with local managers and workers was maintained. We found interacting informally about the elephant problems and the mitigation activities generated positive interactions and responses, both towards the team and the elephants. While formal interactions with the workers and managers were conducted initially, positive informal interactions were subsequently carried out to

				understand the nature and severity of the problem through people's point of view.
Determining ranging behaviour of elephants in Kodagu		✓		Dung surveys, signs, sightings were recorded and documented in forest areas as well as in the agricultural areas. However, we found that it was logistically impossible to conduct line transect surveys in these landscapes with only a small field team. 1. Area and shape of the estates were insufficient for a continuous line transect of even 1 km. 2. The forests were covered with thick lantana coverings and had a poor road network which made transects difficult and dangerous.
Assessing responses/reactions between elephants and people			✓	Opportunistic behavioural observations of both elephants and people were recorded (video, observational) whenever visibility was good.
Documentation of elephant food resources	✓			During the field work, it was realised that vegetation plots in the natural forests were logistical unfeasible. The project therefore focused on elephants within the coffee estates of the study site, and information on tree species were collected from each study estates.
Assessment of crop-raided farms for economic losses	✓			For small field team, it became impossible to observe elephants and monitor the presence of elephants and to also assess the crop-damaged on field. Thus, this was method was abandoned.

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

- The project was extended for a period of 3 months due to the delay in granting of permission from the Forest Department of Karnataka. Although permissions were applied for well in advance and with full support, due to bureaucratic and administrative delays, the official permission letter was given to the principal investigator at the end of November 2010 instead of August 2010.
- Due to the small field team, some of the aims of the project had to be abandoned as mentioned above. Since camera traps (eight units) were deployed in the coffee estates,

more vigilance to avoid thefts was necessary. To avoid thefts and elephant damage, metal camera trap enclosures were made and installed in the field. Private security personnel of each estate were requested to keep a look-out for the camera in our absence during the daily rounds within the estates. However, despite these precautions, one of the units was stolen.

- There were high rates of equipment malfunction (camera going dead, trigger problem, wiring, etc.). Only eight units were installed for the study and loss of one in the middle of the study period required immediate repair of the malfunctioned cameras. This involved making several trips to the institution which made these camera trap units.
- Camera traps alone were not sufficient as they were not spread across the whole study region. In addition, still photographs of sufficient quality for individual identification of the elephants were difficult to obtain within the thick coffee estates. We then started video documentation of the elephants in open areas (water tank, roads within the estates, swamps, etc.) which will now be analysed frame by frame for identification and behavioural responses of the elephants to people and other possible sources of disturbance.
- Due to the rough road conditions inside the states and in study region as a whole, the purchase and then maintenance expenses of the field vehicle overshot the project budget. The nature of the roads (especially during monsoons) also hindered field work locations, and meant that we focused more on the logistically possible coffee plantations rather than working in the natural forests as originally planned. Budget and logistical limitations therefore reduced our capacity to complete all original objectives.

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

1. This study was the first long term quantitative data collection on the elephant population of Kodagu. Thus it will act as a baseline study for future research and conservation activities. Identification of elephant individuals and estimates of the population through camera traps, frequency of use of the landscape at particular times and records from local workers show that there is a pattern to the elephant movements within the region. The data collected indicate seasonality in the use of the landscape as well as marked diurnal patterns. Thus the present study will help in determining the overall elephant population using the agricultural areas and surrounding forests, their daily and seasonal movements, and potential corridors between elephant-critical habitats.
2. Dung surveys indicate increased coffee consumption by elephants within the coffee estates, which may also explain their high frequency of frequenting coffee estates during coffee ripening season; the consumption of coffee may indicate a change or adaptation of food patterns. This may help in understanding the escalating human-elephant conflict dynamics within the study area and in developing a protocol to manage human-elephant conflict.
3. Local community interaction and informed discussions with the local stakeholders about the human elephant conflict (particularly the managers and the workers of the coffee estates) has initiated positive responses towards taking responsibilities in monitoring the conflict and managing the elephant population for better coexistence. Large coffee estates (private and company managed) are willing to work together in creating awareness about elephants, conflict with people, conservation and to take ownership in developing and implementing mitigation methods.

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

1. Local communities were involved in meeting, discussions, sharing experiences and exchange of knowledge so as to better understand people's perception of conflict at the ground level.
2. Two local field assistants worked on this project as full-time employees. Local guards, estate workers also assisted as guides and camera trap guards. They helped in camera trap instalment, use of camera trap and importance of identifying elephant populations and understanding of elephant behaviours. They shared their experience with us to other people who initiated more people's interest in our study and the importance of understanding human-elephant conflict/existence in general.
3. As the team was led by a women scientist, local women workers felt that they too could work to avoid confrontation with the elephants, and women workers were enthusiastic to join in the elephant monitoring groups on the estates. These changing attitudes could be very influential in reducing perceptions of conflict in this region.
4. Since the Kodagu community is a closed-knit society such involvement showed that they are willing to work towards human-elephant co-existence if done in an appropriate and supportive context and with involvement of large stake holders like community leaders and the forest department. We also participated in discussions about the use of research work and assistant in field work and the local communities' attempts to understand the behaviour of elephants, so as to help predict contact or to avoid conflict.
5. People expressed their willingness to continue monitoring the elephant identity after the completion of the project and were keen on developing warning networks to avoid human-elephant confrontations which can result in injury and death.

5. Are there any plans to continue this work?

I would like to continue this work as the present study indicates that better understanding of elephant populations within the region and the people's awareness of elephants and their habitats is vital for creating awareness for the needs and potential for co-existence within the district. If there is funding is available, I plan to develop long term research which will extend the present study to the whole Kodagu district; this would then enhance our understanding of elephant population's ranging within the forests and coffee estates in the district. Understanding ranging will help in developing better mitigation strategies for human elephant conflict, as well as demarcating areas used as routes or corridors between seasonal resources. There is much potential to develop mitigation strategies with people willing to participate in awareness raising, the sharing of ideas and in creating networks within the region to aid in reducing human-elephant interactions so as to avoid any fatalities.

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

The project report (qualitative and quantitative findings and recommendations) will be shared with the Karnataka Forest Department, the estate owners and the other NGOs and wildlife institutions to help implement the recommendations for mitigating human-elephant conflict. The estate farmers and owners are willing to work as a network monitoring elephant populations; thus the elephant IDs will be provided to them for reference along with the recommendations. Publications of the results in scientific journals will be done once the data are analysed.

A power-point presentation about the project and its recommendations will be provided. They have also requested formal training for their staff in learning to identify elephant individuals, which will be conducted at the end of this year along with a presentation of the project.

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

The Rufford Small Grant was used from December 2010 to March 2012. The project had scheduled to begin in August 2010. Due to delay in permissions for carrying out the field work was issued only at the end of November 2010, the field work started from December 2010.

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
Pelican case – camera trap protective cases	641	264	+377	The Camera trap encase was custom-made according to the requirements of field. There were possibilities of elephant damaging the camera trap units or theft, camera trap enclosures were made of iron for eight camera traps
Plexi glass for camera trap	-	NA	NA	See Note below
Camera Batteries AA, Mounting equipment	1000	350	NA	This was not budgeted in RSGF, however due to Department of Psychology, University of Stirling funding, some of the amount was re directed other aspects of the project.
2 GPS Hand Held Mapping system	600	NA	NA	Provided by the Department of Psychology, University of Stirling (See Note below)
4 Sunto Compass (PI + 3 assistant)	300	NA	NA	Provided by the University (See Note below)
Range finder Binoculars	250	NA	NA	Provided by the University (See Note below)
2 Spotlights	100	100	0	
Multi Purpose Printer	200	200	0	-
Guides kit (boots, torches, bags, rain coats)	300	300	0	-
Field assistants salary	600	2687	-2087	The difference in amount was used for providing salaries for field assistants, which was to be utilised

				for the Handheld GPS, Sunto Compasses, and binoculars and from rent of research stations.
Research Station Fees (12 months data +3 months Contingency)	1260	500	+760	From the month of August 2011, we were provided a house for free by one of the estate manager through his company to support us in our project.
Local travel for field assistants and mobile bills	1500	1500	0	
TOTAL	5901	5901		

NOTES:

1. The Department of Psychology, University of Stirling Funding for hand-held GPS, Sunto compasses and Range-finder Binoculars came through after the RSGF funding was applied for.
2. We were given a research station in one of the estates from August 2011 by an estate manager through the company he was working to support me in the project. The house was given free of rent, but the electricity bill was paid by me. This helped us save lot of time travelling to and fro from the earlier research station, which was about 3-4 hours, drive every day.
3. Thus the amounts that were budgeted for the above two were directed towards the salary of field assistants (Actual amount £3600, RSGF amount requested £600) as their food and accommodation were also taken care by me, which were apart from their salaries.
4. Some amount was also directed towards the buying of batteries for camera trap and mounting equipment which were not budgeted in the RSGF application

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

1. Expanding the research to cover the wider forested and agricultural areas of Kodagu.
2. Continued monitoring of elephant populations of the region through use of more camera traps and video recording to build an elephant ID database for Kodagu. This will provide the empirical data on which individual elephants or groups are using the agricultural lands rather than to rely on the presumed assumptions.
3. Long-term study on the elephants' movement paths within the landscape (both within and outside forests, coffee estates, etc.) in wider areas of Kodagu for better understanding of why and when the elephant use the landscape. Long term study on behavioural adaptations of elephants and people is important for their future co-existence.
4. Community co-operation and capacity building and involvement of stakeholders at all levels of working plans, actions and implementation and most important managing the mitigation of human elephant conflict.

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 all official documents, at community meetings and in PowerPoint presentation as the sponsor during the project. It will be used in all future scientific publications, posters, project reports to Karnataka Forest Department and other stakeholders involved in the PowerPoint presentations that would be submitted to the stakeholders.

11. Any other comments?

I thank the RSG for supporting and funding my project.

APPENDIX

(Few Camera trap pictures)



(a) A tusker crossing from one estate to the other



(b) A group crossing at the same place as in the picture (a); the fence has been further damaged



(c) A mother and her calf entering from the neighbouring estate by breaking the fence



(d) The mother and her calf from the picture (c)



(e) Elephants in one of the coffee estates