

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	Sundararaj Vijayan
Project title	The influence of livestock on predation risk from endangered Asiatic lions on Chital deer in Gir National Park and Sanctuary
RSG reference	55.05.08
Reporting period	20 Sept 2008 – June 8, 2009
Amount of grant	£5400
Your email address	vijayan_123@yahoo.com ,
Date of this report	24 Sept 2009

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
Quantifying prey densities in different study areas			√	Road and foot transect (census) conducted for three seasons, and data on livestock population of 54 settlements collected from park authorities. Information on prey group size, its composition, and densities were collected at different study areas. GPS coordinates were also collected for all census points.
Quantifying predation risk for prey species			√	156 recordings of chital deer behaviour using video camera in areas where it coexists with livestock and where it occurs alone. Video recording will allow us to quantify vigilance behaviour (scan rate) of chital deer in different habitats. Two habitat types (acacia thorn and mixed teak) were chosen to determine its influences on predation risk.
Estimating habitat parameters – vegetation and biomass			√	Plots and quadrats to measure habitat structure and vegetation description for all behaviour recording sites. GPS coordinates were also recorded for each site.
Giving up densities (GUD) in different habitat		√		GUD trays were tested during last days of field work to test the prey behaviour. This was partly completed due to lack of time and arrival of monsoon.

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

Video camera to record prey behaviour was only used in mid-November (instead of September) due to a separate application required to get the permission. We decided to give more time to record observation to make up for time lost and to get adequate sample size for data analysis. This affected our Giving up Densities (GUDs) technique which we managed to do it partly during last field days in May/June.

When working out of base camp (> 100 km, eastern part of Gir forest) due to permit rules of entry and exit times in the park (after sunrise and before sunset), we chose to live in paid guest house in temple complex inside the park instead of the park accommodation provided by the forest authorities. This change helped us to optimally utilise the time available for work and to safely return before the sunset deadline. However, this increased our cost budget for the study as we had to pay for accommodation as per tourist charge in the temple complex.

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

Data analysis is presently under progress, however I believe that my project findings would stress on importance of using behavioural indicators to determine main prey distribution and abundance in a very important wildlife reserve (Asiatic lion) when coexisting with human settlements and a large domestic prey population (livestock). This study will reveal the role of apparent competition due to presence of livestock in structuring the native wild prey community (mainly habitat selection due to differential predation risk), which constitute important prey base for critically endangered Asiatic lions. Behavioural observations on fierce carnivore systems may be as useful and diagnostic as data on the respective population sizes of predation and prey. Animals alter their behaviour in response to natural and anthropogenic disturbances before ecologists can detect disruptions in critical demographic processes. So, monitoring behaviour may provide early warnings of the effects of new settlements or shifting of old settlements in other areas of sanctuary on wild prey populations. Habitat management actions reflecting chital behaviour could greatly reduce the dependency of large carnivores on domestic prey.

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

I hired two field assistants and a vehicle driver for duration of the project (15 Sept 2008- 6 June 2009). They were initially trained by me in field methods and data collection (vegetation sampling, transects, and animal observation) which involved using GPS, compass and video cameras. Of the three personnel mentioned above, two were selected by park agencies for regular employment as forest wildlife trackers because of their skills. Also, two daily wagers were hired to construct artificial food trays and to collect fresh grass for Giving up Densities (GUDs) experiment

5. Are there any plans to continue this work?

Most probably yes, in future I plan to conduct some manipulative experiments using artificial life size animal dummies of livestock and chital to further test lion's predation pressure. I also plan to conduct giving up densities (GUDs) experiment at different location to know how chitals trade of predation risk and getting food resources when existing alone and with livestock.

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

This project is the main part of my PhD program; I intend to publish my findings in reputed peer reviewed journals (India and International). This will also form my thesis requirement for Lakehead University. The copies of manuscripts and thesis will be sent to forest authorities in Gir National Park and Sanctuary. During the field work, several meetings were done with Park managers to share the study objectives.

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

RSGF grant was used for actual length of project i.e. almost nine months - 20 Sept 2008 till June 8, 2009.

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 of field Assistants and field allowances	900	970	-70	Field allowances for food were implemented when staying out of base camp (> 100 km, eastern part of the park) for field assistants
Field vehicle (motorcycle and four wheeled vehicle)-rent and fuel	3600	3700	-100	Fluctuation in fuel costs as wells as increase in vehicle hiring cost due to peak tourist season increased the budgeted amount
Field accommodation, for out of base camp (>100 km from Sasan) for three people (10 days/month)	-	450	-450	The team took accommodation in temple guest house (~10 days/month) inside park to optimally utilise the field time as per permit rules (after sunrise and before sunset)
Food trays used to estimate chital harvest rates, food	600	300	+300	Hired two temporary workers for making boxes (GUD trays) and cutting grasses for a month in summer. This experiment was partly done due to lack of time
Office expenditures (photocopy, printing, stationary)	200	225	-25	Office printer and ink, Photocopies of data sheets, stationary items.
Other incidental expenses.	100	100	0	Basic tools for field research (ropes, measuring tapes, knives, first aid pack, medicines)
TOTAL	5400	5745	-345	Exchange rate: 2008-2009: 1 GBP = ~70 Indian rupees

Travel (International and local) from Canada/India and living expenses (~ 2400 GBP) for Researcher (Vijayan Sundararaj) during the field work was borne by his Doctoral scholarship (NSERC PGS D3) from Lakehead University, Canada.

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

Data analysis of the field study and writing reports and manuscripts for publication and dissemination of research findings to Park Authorities in Gir National Park and Sanctuary, India.

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?

The RSGF logo and funding acknowledgement will be published and mentioned in reports and manuscripts (also in Academic thesis for the University). RSGF got publicity during informal

(researcher's meeting) and formal gathering (presentations to Park authorities) during the field days and in the University.

11. Any other comments?

Published scientific manuscripts from this study would be sent to your organisation in future.