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	Buddi S Poudel
Project title	Himalayan Grassland Ecosystems: Understanding the Impacts of Intensifying Pastoralism on Key Plant-Herbivore Relationships
RSG reference	13226-1
Reporting period	10/05/2013 – 10/09/2014
Amount of grant	£5890
Your email address	bpoudel@csu.edu.au
Date of this report	15/09/2014

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
Quantification of plant community structures			Fully achieved	We surveyed plant community structure in eight discrete valleys (each with three sites, resulting in a total of 24 sites) in Upper Mustang, Nepal. We sampled vegetation from a total of 1440 quadrats. We identified 63 species of plants from 52 genera and 17 families. The number of plant species, diversity, and evenness vary significantly between spring and summer. The ground vegetation cover increased from spring to summer. *Pennisetum*, *Poa*, *Kobresia*, *Carex*, *Potentila*, *Artimisia*, *Plantago*, *Caragana*, and *Lonicera* were some of the most abundant genera in Upper Mustang region, Nepal.
Diet assessment of Himalayan marmot		Partially achieved		The spring and summer diet of the Himalayan marmot was determined using micro-histological faecal analysis. Marmots had a mixed diet in both seasons. Marmots' diet niche breadth was wider during summer than during spring. There was a significant difference in diet composition between two seasons. The marmots did not randomly eat species in proportion to their availability. We planned to assess how the diet of Himalayan marmot differs in response to different grazing intensities. However, we conducted this study in intensively-grazed pastures, compared between two seasons. Therefore, seasonal differences in marmots' diet niche were obtained. This did not affect the scope and quality of work, only the design has changed.
Capacity building of a small team of Nepalese workers			Fully achieved	Local people were involved from site selection to data collection. We conducted three half-day conservation workshops for the members of the local herder communities. All participants appreciated learning about the change in plant community structure and the effects on diet of common herbivores.

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

The difficulty has been encountered in the selection of comparable sites with varying degree of grazing. We have been able to overcome this issue by selecting all sites (eight sample areas with three replicates each, a total of 24 sites) in intensively-grazed pastures above 4000 m, rather than a comparison between marmots in lightly and intensively grazed pastures. We, therefore quantified forage availability and determined marmot's diet in spring and summer. Therefore, the treatment (pastoralism) has been changed and season (new treatment) was used instead. We investigated seasonal diet composition under conditions of changed food availability, and seasonal differences in marmots' diet niche were obtained. The change did not affect the scope and quality of work, the only study design has been changed.

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

1.) We surveyed plant communities in Upper Mustang region of Annapurna Conservation Area and identified plant species richness, diversity and evenness among different pastures. We also quantified the above ground plant biomass and examined the forage quality.
2.) We conducted a detained study on diet and determined seasonal food habit of Himalayan marmot, a least understood marmot, from its southern range limits, contributing to the conservation of such common herbivore species.
3.) We spread the message regarding the food habit of a common wild herbivore and the associated ecological understanding among the members of local herder communities, enhancing their appreciation of the ecological functioning and enabling them to participate more fully and on an informed basis in future management planning.

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

We organised three half-day conservation workshops in Kimling, Lhomanthang and Dhiple for the members of the local herder communities. Fifty-two participants took part in the workshop. In workshops, the participants shared their traditional knowledge and experiences about the pastoralism, wild animals and different aspects of conservation, for example the changes they perceived in the habitat and population of wild animals in relation to pastoralism. We shared the scope of the present work, underlying question, ecological concepts, and interaction between wild and domestic ungulates. All participants appreciated learning about the change in plant community structure and the effects on diet of common herbivores. We believe that enhanced their appreciation of the ecological functioning, enabling them to participate more fully and on an informed basis in the future management planning. Also a number of informal meetings were held at various places with local people. The important part of the interaction was a culture of trust and mutual understanding with the herders. Local people were involved from site selection to data collection. We trained and hired eight local people during data collection from different settlements apart from three research assistants, forestry graduates from other villages.

5. Are there any plans to continue this work?

We would like to continue this work focusing on other aspects of pastoralism and effects on wild animals. Based on the outcomes of this project, we plan to conduct a series of follow up studies.

Now, we are investigating the behaviour of Himalayan marmot in relation to pastoralism. It is necessary to develop a sustainable management strategy and action plan based on an understanding of the ecological functioning of the ecosystems and the requirements of the local communities. Therefore, we will continue working in this area.

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

We intend to share the results/findings at national and international conferences/workshops. We will produce a thesis and will provide a copy to concerned management authorities, conservation organisations, and universities and libraries. Importantly, the findings will be presented in publications as journal papers.

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 Rufford Foundation grant was used for 16 months, from May 2013 to August 2014. We planned to complete project activities within 1 year, but we had difficulty in identifying plant herbaria collected during the first year. Our study area lies above 400m above sea level and the growing season is confined to a short period of 4-5 months during summer. Second field trip after laboratory work was not possible in 2013 due to unfavourable climatic conditions. We manage to collect some plant species in second field season (June-July 2014) and identified at National Herbarium and Plant Laboratories in Kathmandu. This caused us to extend the project period until August 2014.

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
Food and accommodation	4320	4250	70	
Local travel in Nepal	450	490	-40	Rise in rate.
Horse ride in field	0	125	-125	We had to hire horse for the movement in the field.
Purchase of equipment's	180	206	-26	
Laboratory expenses	300	240	60	We got help from HWRE/Charles Sturt University.
Conservation workshops – 3	240	288	-48	We managed to accommodate 15 more participants than expected.
Reporting and communication	250	185	65	
Miscellaneous	150	130	20	
Total	5890	5914	-24	

£ Sterling: Nepali Rupees = 1:143.56

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

We are interested to share the findings of this study to a wider national and international community through publication in journal paper/conferences. We are also interested to investigate

the effects of pastoralism on habitat and wild herbivore population taking Himalayan marmot as an example species.

10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

We have acknowledged the Rufford Foundation and the support provided us in conservation workshops. We will be using the Rufford Foundation logo in future presentations. Papers have not been published yet. Rufford foundation will be properly acknowledged in future publications related to this project.

11. Any other comments?

We would like to thank the Rufford Foundation for giving us this opportunity to conduct this study. Our special thanks go to our research assistants who helped us a lot during the fieldwork. We thank local people from Lhomanthang and Chhonhup for their invaluable help during our fieldwork. We are grateful to the Charles Sturt University and Holsworth Wildlife Research Endowment Fund for additional support. We look forward to continuing working with the Rufford Foundation to further investigate various aspects of pastoralism and the effects on small mammals.