

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	Babu Ram Lamichhane
Project title	Study of big cats diet and livestock depredation pattern in Chitwan National Park to reduce human-carnivore conflict
RSG reference	20823-1
Reporting period	Nov 2016 – Dec 2017
Amount of grant	4990
Your email address	baburaml@gmail.com , baburam@ntnc.org.np
Date of this report	2018-04-30

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
Analyse Composition of tiger and leopard diet in core areas and buffer zone of CNP in different seasons				We collected >200 scats from core areas, buffer zone and corridor forests in two seasons. We initially proposed to collect scats in three seasons but we could not continue our research in monsoon (rainy) season due to limited accessibility as the park was closed. We collected enough samples for diet analysis but restricted to two seasons. So, we focused our analysis in different management zones (core area, buffer zone and corridor forest) rather than seasons.
To understand the temporal and spatial pattern				A paper has been published recently in journal PLoS one http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0195373
To aware/inform local stakeholders				

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

I proposed to conduct fieldwork (scat collection for diet analysis) in three seasons but during monsoon (rainy) season the park was closed and I could not continue research which restricted me to collect scats in two seasons (winter and summer) only. But I could focus on spatial analysis between different management zones i.e. Core areas of the park, buffer zone and non-protected area (corridor forest). This enabled us to get a good understanding of tiger-leopard diet composition and their interaction in different management zones.

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

We found that tiger and leopard diet primarily composed of the wild prey species. Chital (*Axis axis*) was the major prey for both tigers and leopards. Tigers consumed higher proportion of the larger prey compared to leopards. There was diet overlap between tiger and leopard especially for medium prey like chital but there was spatial segregation between tigers and leopards with more leopard scats found in buffer zone and corridor forests and more tiger scats found in the park. Livestock contributed < 10% of the tiger/leopard diet while leopard diet contained a higher proportion of the livestock. Most of the scats with livestock remains were originated in buffer zone indicating that low livestock grazing or killing in core areas of the park.

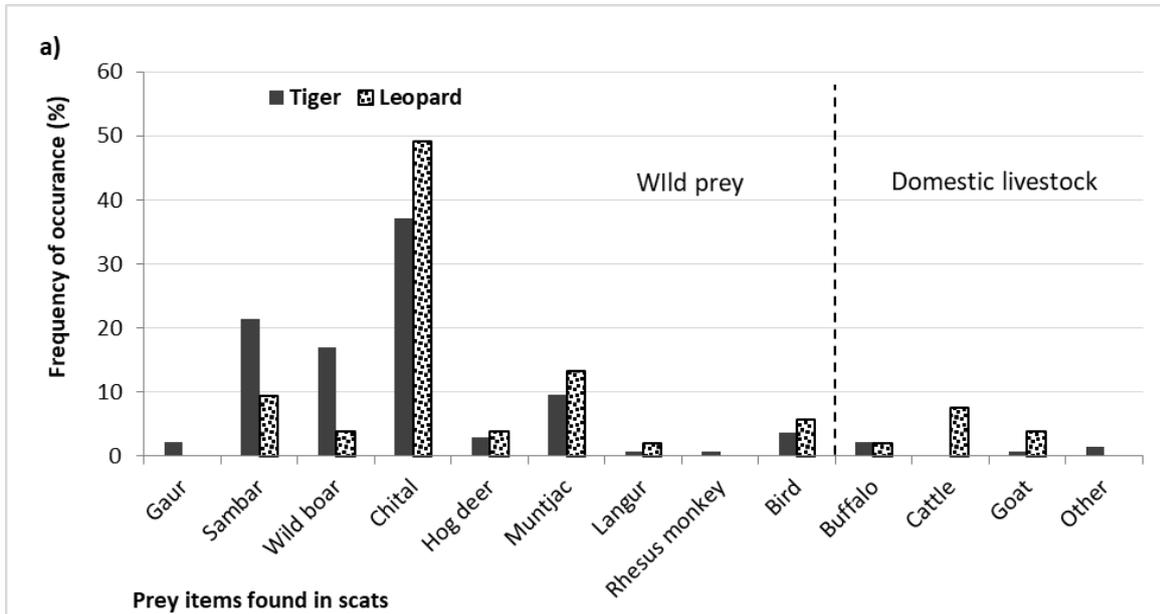


Figure 1. Composition of the tiger and leopard diet in Chitwan National Park and adjoining forests.

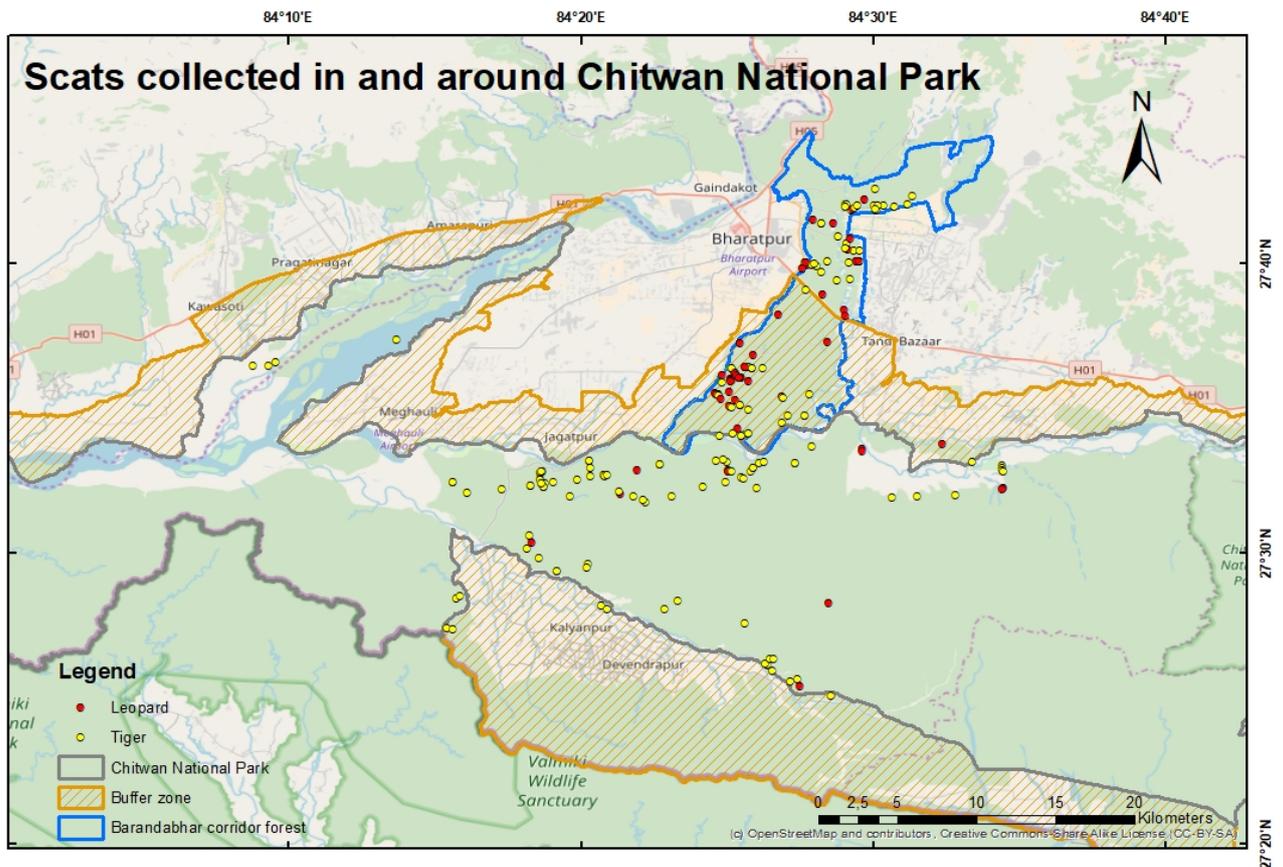


Figure 2. Map showing the location of all scats collected in 2017. Scats were collected across three areas: core area, buffer zone and corridor forest.

Most of the livestock killing (87%) by tiger/leopard occurred in the stall but in close proximity (within 500 m) of the forest edges in the buffer zone. Livestock depredation was not evenly distributed throughout the buffer zone. Livestock depredation has decreased in recently years compared to a decade ago. More depredation was caused by leopards after 2014 than tigers.

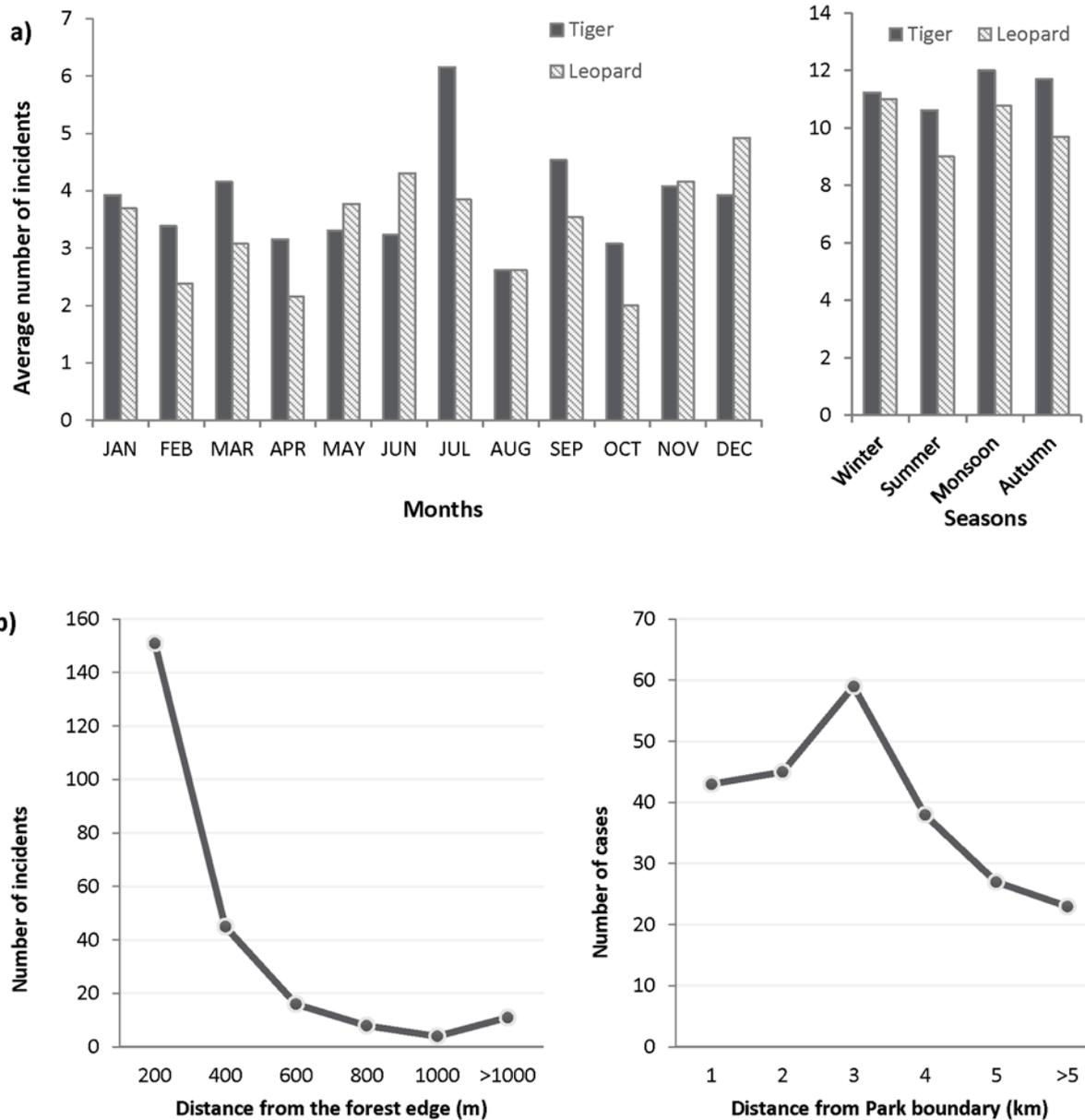


Figure 3. a) Average number of livestock depredation incident per month and season in buffer zone of Chitwan National Park during 1998-2016, b) Number of livestock killed by tiger and rhino in the distance from forest edge and park boundary.

Details of the findings are presented in the research articles published and in preparation.

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

I involved four local youths (member of the community based anti-poaching units) for data collection of livestock depredation. I also mobilised local forest guards for scat collection from the buffer zone and corridor forests in close supervision of NTNC's wildlife experienced wildlife technicians. After completion of survey and data analysis, I conducted four workshops in four sectors of Chitwan National Park for the stakeholders (buffer zone user committee and community forest user group member) informing about the results of the study. We discussed in the workshop about the importance of construction of predator-proof livestock corrals at household level to prevent the depredation. We also discussed about the livestock insurance scheme which helps to get compensation in case livestock is killed by tiger or leopard.

5. Are there any plans to continue this work?

From this project, I found that livestock depredation is concentrated into the buffer zone and corridor forests close to the forest edges. In the next step, I want to focus my research and conservation programs in these areas to assess the prey status in the buffer zone forests. I also want to conduct genetic analysis of the scats to identify the tigers and leopards involved in the livestock depredation. I also want to continue to record the livestock depredation incidents and build a larger dataset to understand the patterns and correlates of livestock depredation. I also want to conduct more awareness program to communities to prevent any possible retaliatory killing.

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

Result of the study has been published in a peer-reviewed journal on the title "Spatio-temporal patterns of attacks on human and economic losses from wildlife in Chitwan National Park, Nepal". Data on livestock depredation component in this article was collected from this research grant which is also included in the funding section of the article. The article is open access and full text can be accessed through following link.

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0195373>

Similarly, I am currently preparing a manuscript for another scientific article including the diet of tiger and leopard as part of my PhD. From this grant, I also supported a Master student from Antwerp University Belgium. He helped me in field data collection and analysis while doing his Master's thesis. His thesis will also be available from university website this summer.

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 budget from the Rufford Foundation grant was used for a year (November 2016 to December 2017). I started my fieldwork in December 2016. Fieldwork included scat collection and visiting the households who lost livestock in past 5 years. Lab analysis of the hair was done in April to August 2017. Analysis of the results and writing the manuscript for scientific journal took couple of more months. I conducted the workshops to the stakeholders sharing the findings of the project in December 2017. It took about 2 months longer to complete the project than I originally expected.

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. 1 £ sterling = NRs. 135

Item	Budgeted Amount	Actual Amount	Difference	Comments
Food & subsistence cost for researcher & assistant	1200	1407	-207	We visited > 250 households in four different sectors of Chitwan, it took more time than we expected to survey the households scattered across the buffer zone of CNP
Sharing workshop (venue, banner and tea/snacks for participants)	400	444	-44	
Field costs (food & subsistence) for researcher and research assistant for scat collection	1680	1333	347	I planned to conduct survey in three seasons but due to accessibility issues, survey was conducted in two seasons only
Microscopic hair analysis of scat samples	560	659	-99	
Ziplock plastic bags for scat collection, data sheet printing, GPS batteries, clipboards & other stationaries	400	385	15	
Communication costs (internet, phone etc. @ 15/month for 10 months)	150	170	-20	
Local transportation during fieldwork	600	703	-103	
Total	4990	5101	-111	

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

Our findings suggests that livestock depredation is occurring mostly in buffer zone or forests outside (corridor). Although tiger and leopard diet contained low percentage of livestock, it's still a significant issue in these forest fringe areas. Most of the livestock depredation occurred in the stall, which indicates the need of better livestock husbandry practices. If they are not compensated in time or experience repeated attacks, they might develop negative attitudes. Awareness programme focusing in the fringe areas need to be continued to prevent any retaliatory killings. We also need to understand the status and increase density of wild prey in buffer zone and corridor forests. Similarly, better understanding of whether same individual or multiple individual of tiger/leopard is causing the depredation is also important. It helps in identifying and taking actions to remove if specific conflict-causing animals are involved (Lamichhane et al. 2017).

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?

I used Rufford Foundation logo during the sectoral stakeholder's workshops. I acknowledge the funding (this grant) of Rufford Foundation in research articles published, in preparation and in my PhD thesis.

11. Any other comments?

I have also included following three files attached with this report

1. Published research article on PloS One.
2. Research article manuscript in preparation (non to publish in Rufford website yet, will make it available once it gets published).
3. MS thesis of Mr. Simon Reynart who worked under my supervision for his this thesis and data collection done from this grant (non to publish in Rufford website yet, will make it available once it approved by the University).

We also plan to write a research article for peer-review publication based on MS thesis report of Mr. Reynart.