

## The Rufford Foundation Final Report

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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](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

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Grant Recipient Details	
<b>Your name</b>	Lha Tshering
<b>Project title</b>	Evaluating Habitat and Human-Bear Conflict in Phrumshingla National Park, Bhutan - To Seek Solutions for Human-Bear Co-existence
<b>RSG reference</b>	19849-1
<b>Reporting period</b>	1 <sup>st</sup> June 2016 to 30 <sup>th</sup> June 2017
<b>Amount of grant</b>	£ 5000
<b>Your email address</b>	khotsalopon@gmail.com
<b>Date of this report</b>	30 <sup>th</sup> June 2017

**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
1. To investigate the status and distribution of bear in Phrumshingla National Park				Further intense study regarding the bears dietary habitat and food preferences need to be studied
2. To assess the root causes of human-bear conflict in Phrumshingla National Park				
3. To assess people's perceptions and attitudes towards Himalayan black bear				
4. To provide practical measures to address the human-bear conflict in the country.				

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

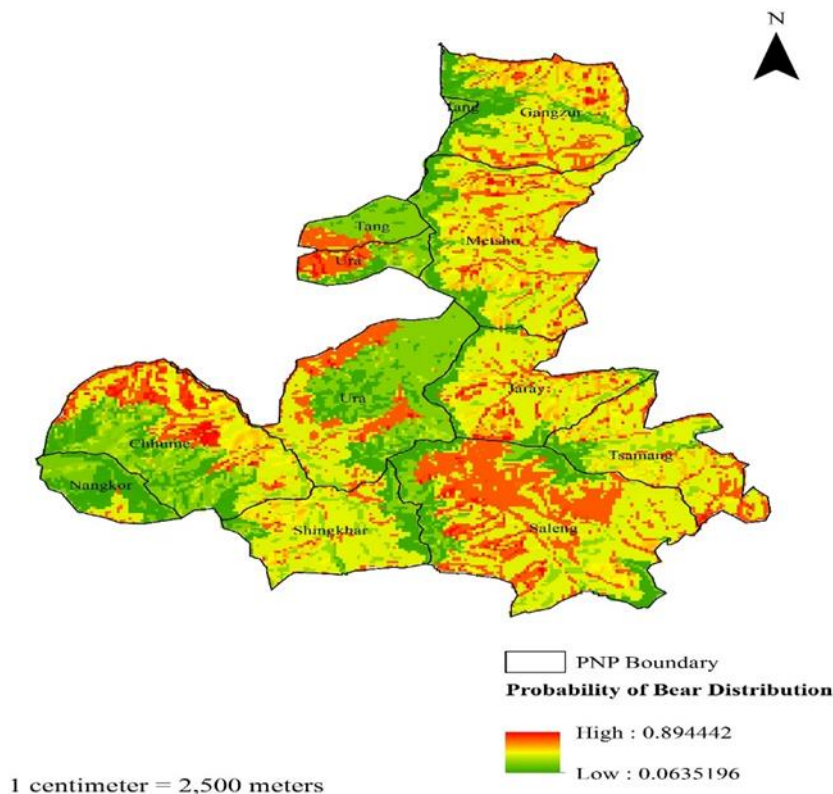
Data collection timing correlated with farmer's busy agricultural schedule, the harsh weather conditions and the steep terrain making the plots inaccessible to collect.

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

1) Himalayan black bear is mostly distributed between 2300 m asl to 3700 m asl inside the study area

*Himalayan black bear distribution mapping*

According to the study, HBB is highly distributed in Saleng Gewog under Mongar Dzongkhag, followed by Ura and Chumey gewog under Bhumthang dzongkhag (Figure 1). The HBB was often less distributed in low elevation areas such as Nangkhor gewog and along Kuri Chu basin under Mongar Dzongkhag. HBB is mostly distributed in the cool broad leaved, mixed conifer, blue pine and fir forest similar to the finding of TNP (2008).



**Figure 1:** Himalayan black bear distribution map

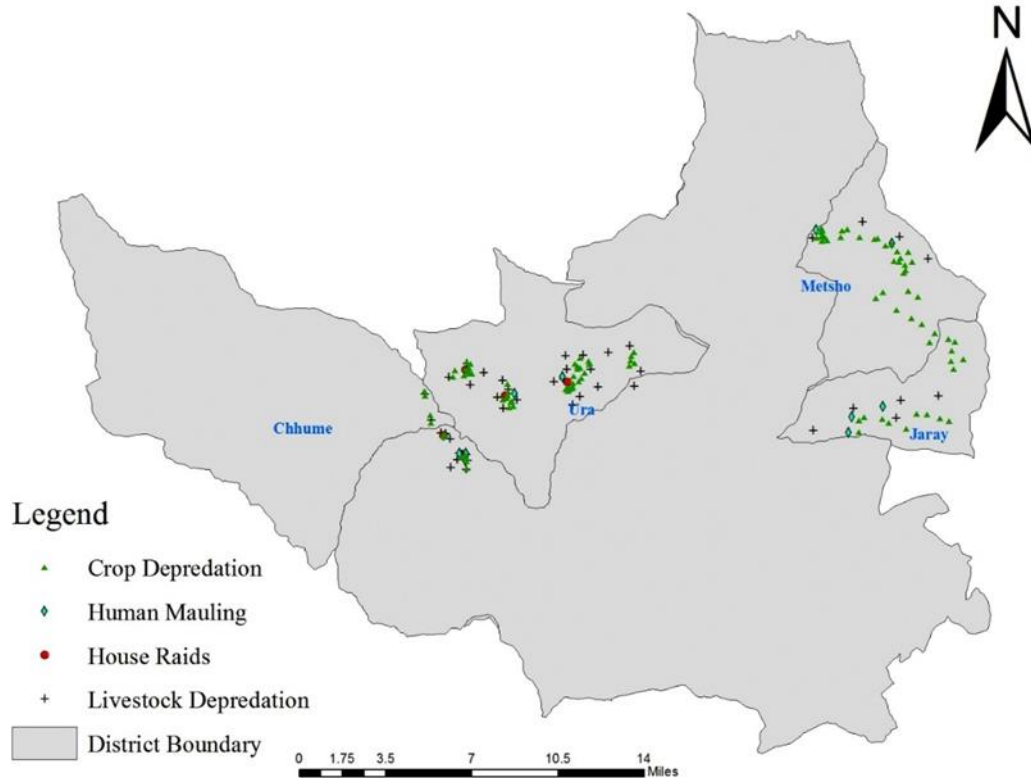
As HBBs usually inhabit in tropical, subtropical, temperate broadleaved and conifer forests with altitudinal range up to 4300 m and are rarely found at alpine meadows (WWF, 2012). Similarly in Bhutan, HBBs are mostly distributed within elevation ranges from 1200 m to 3750 m (Wangchuk *et al.*, 2004) which has similar findings to the study as shown in above Figure 1.

## 2) Bear conflict based on landholding

Bear conflict based on type of land holding revealed that, high number of bear conflict occurred in areas with higher dryland ( $n = 149$ ) holding followed by vegetable garden ( $n = 111$ ). Crop depredation mostly occurred in dry land since majority of the respondent cultivated maize, wheat, buckwheat and vegetable which are the main sources of food for HBB. The scats analysis by Ali *et al.*, (2017) revealed that crop remains such as maize was much greater than other major foods in HBB. Similarly Jamtsho and Wangchuk (2016) also found HBB depredation on maize crops was maximum compared to vegetable crops which contradicts. This suggest bear food preference over crops cultivated.

The hypothesis of types and extent of conflict to be same throughout the study area however the hypothesis was rejected because the type and extent of conflicts in the all the four study areas were different (Chi-Square test  $\chi^2 (3) = 28.574, p < .05$ ). Similarly it could be attributed to different type of land holding, cropping patterns and livestock reared.

HBB overwhelmingly depredated mostly on maize crops compared to other agricultural crops which further requires an additional study.



**Figure 2:** Human-Himalayan black bear interaction in PNP

### 3) Valuation of monetary losses on crop damage and livestock depredation

With total losses of 298 heads of livestock and 15,825 kg of crop to HBB, the study assessed the loss in terms of monetary value. Monetary losses were evaluated based on the losses incurred by the affected household ( $n = 147$ ) in the study areas. The study found that total losses suffered by all households in the communities were Nu. 13, 07,875/- for the past five years with overall mean loss of Nu. 8,897/- per household.

### **Indicator of Conservation threats to HBB from the park staffs.**

The park apprehended six bear poaching cases during the last 5 years. Eastern Park Range reported the highest poaching cases with five cases being apprehended followed by single bear case apprehended in the Western Park Range. In these cases, the HBB was mainly killed in retaliation to crop and livestock depredation followed by purposeful hunting, and accidental trap set for other wildlife. Setting up of traps was the most widely used methods for killing the bear by the poachers for bear bile.

The main challenges faced by the park was the lack of community's participation followed by the lack of funds for carrying out any conservation activities in the park. The best mitigation measures toward avoiding and reducing human-bear conflict was through community awareness (46%) followed by electric fencing (38%) in the study area. However, initiatives for conflict reduction should be focused in places

where conflict is likely to occur and where conflict management strategies have the greatest potential to be effective (Northrup *et al.*, 2012).

### **Respondents' suggestion to reduce human-bear conflict in future.**

In order to reduce human-bear conflict, the best mitigations measures to avoid bear conflict in the study area were asked to the respondents. In response, electric fencing installation was suggested as the best measure to reduce human-bear conflict (63%) as well as other wildlife conflicts in the area. Similarly, electric fencing proved be effective in reducing human-bear conflict if strategically located and well implemented according to Dorji (2016). Electric fencing not only safe guards the crops from wildlife depredation but also significantly reduces the number of sleepless nights guarding the agriculture fields (WCD, 2013). However mitigation strategies such as electric fencing and frightening devices may be inappropriate to apply that can alter the behaviour of depredating bears (Conover, 2002). Moreover, it is expensive for the government to provide electric fence to all the farmers experiencing HWC.

### **Conclusion and Recommendation**

HBB is highly distributed in Saleng gewog under Mongar Dzongkhag, followed by Ura and Chumey gewog under Bhumthang dzongkhag. The HBBs highly suitable potential area is 289 km<sup>2</sup> and least suitable area count of 616 km<sup>2</sup>. However further systematic bear habitat distribution is recommended for the whole park to generate accurate data. Most of the bear conflict occurred in dry land areas followed by vegetable garden.

Crop damage reported the highest cases with 58% ( $n = 104$ ) followed by 24% ( $n = 43$ ) cases of livestock depredation. Similarly bear mauling cases of 14% ( $n = 12$ ) and house raid 3% ( $n = 6$ ) are also being reported in the study area. The crops depredation by HBB on maize was overwhelmingly high. Similar crop depredation on vegetables and other cereals were also recorded. However since the result is purely interview based, there is need of study for the preference of the crop raid by bear in future. The crop depredation mostly occurred at night during autumn and summer seasons when crops are in the matured stage. A total of 298 numbers of livestock has been killed with mean loss of seven livestock per household for the last 5 years. The highest number of livestock being killed was sheep followed cow. Similarly livestock depredation on yaks and horses were being reported in the study area. All livestock depredation occurred during the night. One possible reason for increase in livestock killed could be due growing practice of unsupervised livestock guarding, however the rate of increase in attack is not known which need to be further studied. Bear-human attack occurred during the summer followed by autumn season while collecting NWFP from the forest. The bear mauled the victim mostly on the face, followed by body and legs.

With total losses of 298 heads of livestock and 15,825 kg of crop. The study found that total losses suffered by households in the communities were Nu. 13, 07,875 for the past five years with overall mean loss of Nu. 8,897 per household.

The park apprehended six number of bear poaching cases for the last 5 years with farmers being the main illegal traders. The HBB were mainly killed in retaliation to crop and livestock depredation followed by purposeful hunting and accidental trap set for other wildlife.

The main challenges faced by the park was the lack of community's participation followed by the lack of funds for carrying out any conservation activities in the park. The few numbers of respondents reporting the damage caused by bear to the concerned office indicate the ineffectiveness of the policy in place or compensation scheme which need to be reviewed further.

Therefore with the frequent and widespread incidences of human-bear conflict in and around PNP boundary, it is recommended that bear conservation activities should be focused beyond the park boundaries. More awareness campaigns on wildlife conservation values with special focus on endangered and key species need to be carried out beyond the parks boundaries. Additionally, it is recommended to test the feasibility study on sustainable community-based livestock and crop insurance scheme to increase the tolerance of farmers on damage caused by bear. Further research on HBBs food preferences, feeding habits and habitat utilisation need to be carried out in PNP and in the country in general identify the source of conflict.

Human-bear conflict is due to habitat destruction and providing of electric fencing may help reduce the conflict.

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

The involvement local communities were the key motives which included actively engaging them in awareness campaigns, interviews and as a local guide towards the field visit in their area which are well aware off.

#### ***People's perception and attitude towards bear conservation policy and population trends***

Studies conducted by Whittaker *et al.*, (2006) found that the best management strategies for addressing human-wildlife conflict is through changing the general attitudes and people's perception on the importance of wildlife-the need to coexist harmoniously. Attitude is a mean of describing groups thought towards wildlife management issues (Manfredo, 2008). Therefore understanding the perception of farmers about wildlife is important to change their attitudes towards wildlife (Conover, 1994; Hill, 2004).

To this end, people perception and attitude towards HBB was assessed. The study found that 87% ( $n = 213$ ) of the total respondents were aware that HBB is protected under the conservation laws, such as FNCA, 1995 and Forest and Nature Conservation Rules (FNCR) 2006. However, 13% ( $n = 33$ ) of the respondents reported that they were not aware about the conversation policies.

About 41% of the respondents from Ura gewog said that the population trend of HBB is increasing and this could be attributed to high number of conflicts and frequency of bear sighting in the gewog as stated earlier. Similarly, increase in bear population has been reported by WCNP by Sathykumar and Choudhury, (2007); Jamtsho and Wangchuk, (2016).

#### **Indicator of conservation threat to HBB from the community**

Killing of bears with the hope of reducing damages has been a serious threat to the survival of the HBB (Liu *et al.*, 2011). Bumthang has been reported as one of the three districts in Bhutan, where highest bear kills were recorded (Sangay and Vernes, 2008). It was found that 18 respondents from the study area heard of bear being killed in their locality. Ura gewog reported the highest kill ( $n = 9$ ) followed by Jarey ( $n = 5$ ) and Metsho ( $n = 4$ ) gewogs. This could be largely be due to high nature of conflict in the area. It could also be due to the high price international market offer for bear bile especially towards the Northern border which the people are well aware off (TNP, 2008). The bear are killed out of frustration in retaliation to crop and livestock damages hindering conservation efforts (Treves and Karanth, 2003; Bhatt, 2003; Northrup *et al.*, 2012).

People perceived that the bears were mainly killed for monetary value 26% ( $n = 71$ ) followed by frustration 25% ( $n = 68$ ) and for self-defense 23% ( $n = 64$ ). Similar finding was also reported from JSWNP by Wang *et al.*, (2006) and in WCNP by Jamtsho and Wangchuk (2016) to exterminate problematic wildlife by the respondents. Can *et al.*, (2014) also observed that people killed bear with the hope that it would reduce conflict out of frustration, thereby hindering bear conservation efforts.

#### **5. Are there any plans to continue this work?**

Yes, further this work need to be continued in terms of other block/districts in order to correlate the findings and engage more local communities through awareness campaigns which will enable to reduce future conflicts.

Further studies on the bear dietary habitat, food preferences need to be thoroughly studied in order to better understand their ecology.

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

The report will be made available through publication in the website such as journal and article. Moreover hard copies will be printed and made available to relevant organisations and colleges.

#### **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 as per the timescale proposed for a period of one year, i.e. 1<sup>st</sup> June 2016 to 30<sup>th</sup> June 2017

**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
Purchase of Garmin ETREX 10 GPS(One Number) for field survey	110	150	-40	The transportation charge and tax had to be paid
Digital Camera (Sony Cybershot,DSC-WX150)	160	160		
Binocular (Barr and stroud 12X50 sahara binocular)	180	200	-20	The transportation charge and tax had to be borne
Printing of survey forms	40	40		
Field Reconnaissance survey and conservation awareness program (2 days X 6staffs X£5.37)	64.44	128.8	-64.44	Field survey had to be conducted for four days in each four blocks
Field survey and data collection for four blocks (10 days X 8staffs X £5.37)	429.60	429.60		
Field survey and data collection for four blocks (10 days X 16 graduates X £5.37)	859.2	859.2		
Charges for potters and ponies while shifting camps and station in study area where there is no motor able road access	340.8	340.8	+50	Since majority of the study area was accessible through motor able road, the excess amount was adjusted in the vehicle rental charges
Field staffs training for Parks staffs and CNR graduates(3days X 24 Staffs X £5.37)	386.64	386.64		
Purchase of training materials(Charts, Boards, Markers) and Lunch and refreshment during the training	213.36	220	-6.64	
Social survey interview for 50% of the household from four blocks(Fooding and lodging for 28 Staffs X 5 days)	500	500		



Vehicle rental and hiring charge for the entire trip during the project travelling from district to district and blocks to block within the study area	550	600	-50	The predicted distance to be covered by vehicle increased since new motor able roads were connected
DSA/Refreshment for interview respondents(400 heads)	450	450		
Conducting awareness campaigns to the Public(Food and refreshment) for 400 heads	400	400		
Conducting educational campaigns to School Teachers and Children (Food and refreshment) 800 heads	500	500		
Posters and Banners on Human Bear conflict information and conservation to be displayed and distributed in Public places such as Schools and Offices( 5 nos. X £ 30)	150	150		
Pamphlets, badges and stickers for educational awareness programs	200	200		
Media Awareness	50	50		
Data compilation, Report writing and presentation on findings and conservation awareness and exit meetings with the parks staffs and the concerned stakeholder (Working Lunch and refreshment for 1 day)	300	300		
Payment for report publication(10 copies X £ 20) for distribution to concerned offices	200	200		
<b>Total</b>	6084.04	6265.04	-181	The difference amount was being adjusted from the Park office

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

Further in depth study regarding the ecology, dietary analysis and food preferences of Himalayan need to be carried out.

Moreover such studies will need to be focussed not only inside the protected area but outside the protected areas too.

**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?**

Yes the Rufford Foundation logo was being extensively used in materials printout such as banners and posters, in presentations while conducting awareness campaigns in the study area. With the generous support from the RF, the communities as well as the keen conservionist in Bhutan has highly appreciated the noble approach of the Rufford Foundation, for rendering financial support to carry out conservation activities in Bhutan, which has helped the people at large in reducing Wildlife conflicts.

**11. Any other comments?**