

Final Evaluation Report

Your Details	
Full Name	Suman Shree Neupane
Project Title	Genetic Diversity and Conservation of Himalayan Black Bear in Nepal
Application ID	32168-1
Date of this Report	12/10/22

1. 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
To study the genetic diversity of Himalayan Black Bears in Nepal				We carry out non- invasive genetic sampling to collect genetic information of the black bears in Nepal. We successfully collected the data from three PAs of Nepal i.e., from central and eastern region. We have genetic information of the central and eastern regions, but we don't have enough data from western and far-western regions to elucidate genetic level diversity in Nepal.
To understand the status of Black Bears population distribution and habitat suitability in Nepal				Now we have information on the black bear distribution and potential information on its suitable habitat. We collected the information on its distribution throughout the country. We are working on its manuscript for publication and dissemination.
To identify the conservation priority zone in protected areas of Nepal				Based on the field survey and records of incidents of black bears, we identified the conservation priority areas in Gaurisankhar and Kanchanjunga Conservation Area, and Sagarmatha National Park. In addition to this, we have also assessed conservation priority areas throughout Nepal based on secondary sources. We also carried out conflict zone mapping in Gaurisankhar Conservation Areas to identify conflict hot spots as the incidents of human-bear conflict were frequently seen.
To carry out conservation awareness programs to the local people				Local farmers, members of BZCFUGs, CAMCs, aware about the conservation awareness of the Himalayan black bear in the conservation priority areas where human-black bear conflict is higher

2. Describe the three most important outcomes of your project.

a). Genetic Data Base

We collected the genetic sample of Himalayan black bears from three protected areas of Nepal. This is the first ever study on genetic diversity in the eastern and central Nepal. Kadariya studied on the genetic diversity of Himalayan black bears in Annapurna Conservation Area, in western Nepal. Now we can compare the genetic diversity and structure of Himalayan black bears in the mountains of Nepal. Yet we need to increase the sample size for the in-depth study of genetic status of Himalayan black bears in Nepal. Through this project we collected the genetic data base for three protected areas of Nepal which can contribute to develop conservation policies for black bears in Nepal.

b). Awareness Raising Programs on Black Bear Conservation

We carried out awareness raising programmes to local farmers, forest user groups, youth and women in different parts of project area i.e., Sagarmatha, Kanchenjunga, and Gaurishankar. We share about the importance of black bear conservation through discussions and small presentations. We mostly discussed on the local mitigation strategies, the time bears were mostly active, and possible measures to avoid bear encounters. We avoided sharing of pamphlets and postcards due to Covid-19 protocols. Due to the Covid-19 impact, we limited the number of participants in the programme. The awareness raising programmes were mostly centred to household levels due to Covid-19 protocols. We even approached to local leaders and members of local government to focus on local strategies to mitigate human bear conflict during bear activation period. Overall, conservation awareness programmes were mostly focused on conflict prone areas where conflict was reported frequently and needed urgent response.

c). Understanding of Human Bear Conflict and local people perception on Black Bear conservation

Human-black bear conflict in the mountains of Nepal is serious conservation threat. Thus, during our project period we carry out two additional research on Gaurishankar Conservation Area and Sagarmatha National Park. The research mostly focused on understanding the local people perception on Himalayan black bear conservation and pattern of Human Bear conflict in area. This study helped us to prioritised conflict prone area and conservation activities were carried out accordingly. In addition to this, understanding the need of local people, we also carried out additional research during the project period to assess the feasibility of mitigating human wildlife conflict through community-based insurance scheme. We are developing manuscript of the research for publication in international and national journal.

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

Impact of Covid-19 Pandemic

The Covid-19 pandemic imposed the greatest challenge to our project. Project implementation got delayed because of the outburst of the virus. Even after the implementation, we missed the peak season of its occurrence even after we started

field survey because of the second outbreak. Second outbreak largely impacted the whole country. Therefore, we postponed our project activities several times. The vaccines were still unavailable. So, we followed the government protocols and safety measures to be safe from the pandemic. One of our team members were infected with the virus during her field days in Sagarmatha National Park. She was supported by the park officials and local people during the time she was in isolation. In addition to this, as schools were remained mostly closed during the pandemic, school level orientation programmes were mostly discarded and number of participants in awareness raising programmes were also limited.

Quality of genetic samples

Using non-invasive genetic sampling is itself difficult. It was difficult to collect fresh scats of black bear often. We mostly collected scats that were less than a week old. We couldn't revisit the same location at different times. We obtained far fewer samples from Sagarmatha National Park compared to other protected areas. Therefore, we also focused on collecting hair samples from the bear resting sites and rubbed trees to increase the genetic sample quality.

Travelling Days

Black bears mostly occur at higher altitudes above 2000 m. Samples obtained were mostly found from 2200-3300 m. Thus, in most of the areas, to collect data, we needed to trek 3 to 4 days. Therefore, the number days to stay in field were increased and it normally took more than expected days in the field.

4. Describe the involvement of local communities and how they have benefited from the project.

Local communities directly and indirectly got involved in our project. We supported our team members to carry out their research work on black bear conflict and distribution. One of our team members pursue her BSc project on human-black bear conflict in Sagarmatha National Park and other member carried out MSc thesis on conflict and habitat suitability analysis of black bears in Gaurishankar Conservation area. In addition to this, during the field survey we used local people to identify forest area, black bear occurrence points, and its habitat. They also supported us with logistic arrangement during lock down. They supported us to collect scat, hair samples and valuable information related to black bear ecology and interaction with humans. We helped local team member to enhance their skills and knowledge in black bear conservation. In addition to this, we also interacted with the victims of Bear attack and the affected families. Moreover, we carried out community workshop and discussions programme on conservation of Himalayan black bear following Covid-19 protocols. We interacted with more than 150 people in different community workshop, discussions, and individual interactions.

5. Are there any plans to continue this work?

Yes, we do have plans to continue this work. This project has generated baseline information on genetics and conservation of Himalayan black bears in Nepal. We have collected the genetic information from two regions of the country other areas in western and far western regions remain unexplored. The collected data so far is

not enough to study the level of genetic diversity in Nepal. Thus, we need further expansion of research activities. In addition to this, human-bear conflict is a serious issue throughout the country. We have come across many such regions in Nepal, where conservation education is most needed. Raising awareness and supporting black bear conservation must be carried out in such regions. Thus, in the next phase we plan to increase the number of conservation activities in high conflict prone areas through communication, education, and participation. Studying human-black bear conflict is must in every area where bears are often observed. Therefore, in upcoming days we plan to carry out detail research on human-black bear conflict in Nepal and explore different mitigation strategies adopted by local people to be safe from bears.

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

We have already started sharing our project outcomes in various platforms. Firstly, one of our team members presented her research on Institute of Forestry as a part of her BSc thesis. She presented both in oral and written form. In addition to it, other team member is working on her master's thesis defence. She will be presenting her research work on Gaurishankar Conservation Area both in oral and written form. We have also plan to submit the report and outcome of our studies in respective Protected Areas, Department of National Park and Wildlife Conservation, National Trust for Nature Conservation and universities students. Moreover, we have started working on publishing our research results on national and international journals. Few of our collaborative manuscripts are in progress. We will also update our findings in our personal vlogs, websites, news articles and so on.

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

We used non-invasive genetic sampling method from scats and hair to assess the genetic diversity of Himalayan black bear in the protected areas of Nepal. We collected the samples from eastern and central regions of Nepal whereas western and far western regions are still unexplored. Thus, in the next step we would like to collect the genetic data from other part of the country. Once, we have the samples from all over the regions, we can elucidate the level of genetic diversity.

During this, research period, we found that human-black bear conflict is prevailing all over the country. Thus, detail research on conflict is required to mitigate human-black bear interaction and promote co-existence. In addition to this, conservation of Himalayan black bear is a serious issue. The species have been least prioritised in terms of conservation in comparison to other species. Thus, in depth conservation programmes are urgent need in and around the black bear habitat. Thus, we plan to organise detail research on human black bear conflict and promote conservation activities in their habitat.

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

Yes, we used Rufford Logo on our flex, posters, and oral presentations. We will also acknowledge The Rufford Foundation in our future publication and conference participation for their assistance and financial support.

9. Provide a full list of all the members of your team and their role in the project.

S. No.	Name of Members	Role
1.	Barsha Tripathi	Team Member (Sagarmatha National Park)
2.	Pooja Basnet	Team Member (Kanchenjunga Conservation Area)
3.	Laal Bahadur Khatri	Local Resource Person (Gaurishankar Conservation Area)
4.	Lakpa Tinthi Sherpa	Local Guide (Gaurishankar Conservation Area)
5.	Geli Sherpa	Local Guide (Gaurishankar Conservation Area)
6.	Badi Tamang	Local Guide (Gaurishankar Conservation Area)
7.	Taashi Dale Sherpa	Local Guide (Kanchenjunga Conservation Area)
8.	Dawa Jagnbu Sherpa	Local Guide (Sagarmatha National Park)
9.	Kami Nuru Sherpa	Local Guide (Sagarmatha National Park)

10. Any other comments?

We are grateful to The Rufford Foundation for their support for research and conservation of biodiversity.