Final Project Evaluation Report

Your Details	
Full Name	Dr Nishikant Gupta
Project Title	A survey of the distribution and population status of otters in Uttarakhand, India
Application ID	24456-1
Grant Amount	£5,000
Email Address	nish200684@gmail.com
Date of this Report	02.09.2019

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
Identifying distribution of otters in riparian habitats of Kosi, Ramganga, Khoh Rivers and rivers of RTR			■	Field surveys were conducted in four Himalayan rivers (reaches of the Kosi, Ramganga, Khoh and Song Rivers)
Collect qualitative data on communities' knowledge, attitudes and perceptions towards otters through social science survey			■	Semi-structured interviews (N=379) were conducted with members of local communities to collect qualitative data on views and perceptions towards the species
Preparation of an updated location map identifying existing/emerging anthropogenic and climatic threats for the otter species			■	Habitat suitability maps were created using remote sensing data, survey findings and GIS to provide information on reaches to be targeted for future conservation efforts
Conducting awareness camps for local stakeholders			■	Community-based otter awareness camps were organised for local youths (N=105), adults (N=115) and school children (N=256; 10 schools)
Provide critical information to policy makers towards developing a targeted, species-specific conservation program		■		Two of the three otter papers are currently in review in two separate scientific journals.

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

The proposed plan was to identify the distribution of otters in riparian habitats of Kosi, Ramganga, Khoh Rivers and rivers of the Rajaji Tiger Reserve. However, approval was not obtained from the Uttarakhand Forest Department for the survey work inside the Corbett and Rajaji Tiger Reserves. Hence, given the time period allocated for the survey, the chosen sites were modified slightly. The Song River was sampled instead of the rivers inside Rajaji, and the Ramganga River was not sampled inside Corbett. I hope to sample these during the next phase of the work.

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

a) This study provides critical interdisciplinary baseline information to guide decision-makers towards developing a targeted, otter-specific conservation program for this important Himalayan biodiversity hotspot.

b) The otter conservation education programs conducted during this study resulted in a proposal to set up a community-based conservation initiative (CBCI).

c) The CBCI has been tasked to monitor and report otter sightings from the area, potentially representing a way forward for achieving simultaneous otter conservation and associated ecosystem benefits for local communities.

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

The social science surveys were conducted with the aid of semi-structured interviews to document local community knowledge, attitudes and perceptions towards otters, i.e. (i) have otters been present in the past in your area?; (ii) are otters present in your area now?; (iii) have otter numbers here been increasing, decreasing, stable, or not known?; and (iv) are any factor(s) perceived as threatening the otter population?. The respondents were from the communities located along the rivers. As many households as possible were approached for the survey (both men and women) to ensure that a significant number of individual responses were obtained for the analysis.

The community selection was based on the voluntary willingness and the availability of members in the study area during the field survey. Consent was requested and obtained from all the participants to make notes of the conversations. All responses were kept anonymous so that respondents felt free to express their views.

Otter conservation education programmes were also conducted to promote awareness about the importance of otters as top carnivores in river ecology, through informal talks with local people, forest managers and nature guides, presentations and education programmes at community groups and at schools, and by putting up posters and distributing leaflets. This was conducted after the questionnaire surveys to avoid influencing respondents' answers.

A total of 279 semi-structured interviews were conducted during the survey period among villages present along the rivers. Participants included local community members, aged between 18 and 70, with 204 men and 75 women being interviewed. Respondents were shown photographs of otters, and 20% reported not having seen otters in the preceding 5 years during their day-to-day work along the rivers. Sixty percent of the respondents mentioned that, although they had not directly seen otters, they knew someone from the area who had, or had seen indirect signs of otters themselves. They highlighted that this could either be because the animals are shy in nature, or they are not present in as large a number as they

had been over a decade ago. The remaining 20% of the respondents had seen otters in the wild, either in the rivers during dusk or along the banks during dawn.

Interestingly, 40% of respondents mentioned that, although not aware of any cultural or religious associations with otters, they believed that killing any living species will bring bad luck. Fifty-five percent of the respondents mentioned that it was likely that otters have some importance, but were not aware of their exact function. Ninety percent of the respondents mentioned that there had been a sharp increase in human-induced stressors in the area, which could impact otter species. Ten percent of the respondents preferred not to answer this question. Remarkably, 15% of respondents mentioned that the weather change had resulted in less rainfall, hence less water in the rivers and their tributaries especially in the drier months, which could have impacted otter populations. These observations are supported by published literature.

The otter conservation education programmes assisted in securing the involvement of local community members in setting up a community-based conservation initiative (CBCI) to monitor and report otter sightings from the area. This was extremely helpful, as it showed immediate results as photographs of observed otter footprints and latrines are being sent by CBCI members to the research team. Additional strategies to enhance the sustainability of the initiative will be a key focus area during the planned second phase of the field research.

5. Are there any plans to continue this work?

There are definitely plans to continue this work. There is a need to ensure regular monitoring of the existing otter habitats by strengthening the capacities of local community members to help generate a database on the population status of otters. Engagement of local people in identification with their local wildlife and its conservation is significant as the biodiversity and ecosystem services of 'cultural landscapes' are shaped by human management. The otter conservation education programmes conducted during this study resulted in a proposal to set up a community-based conservation initiative (CBCI) to monitor and report otter sightings from the area, potentially representing a way forward for achieving simultaneous otter conservation and associated ecosystem benefits for local communities

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

Providing this critical information to decision-makers in influential bodies at the national level and internationally could assist towards development of an otter conservation programme for Uttarakhand and other similar regions. This will be carried out through the publication of the following scientific papers on otters (updated versions of the manuscripts are attached along with this report):

1) Gupta et al. (under final review with the Chief Editor). Assessing the distribution pattern of otters in four rivers of the Indian Himalayan biodiversity hotspot. *Aquatic Conservation: Marine and Freshwater Ecosystems*

2) Gupta et al. (under final review). The potential role of social media in support of the conservation of otters in Uttarakhand, India. *IUCN Otter Specialist Group (OSG) Bulletin*

In addition, a separate manuscript was prepared and published based on the data collected on the species richness of birds from the study sites (published manuscript is attached along with this report):

1) Gupta et al. (2019). Avitourism opportunities as a contribution to conservation and rural livelihoods in the Hindu Kush Himalayas – a field perspective. *Journal of Threatened Taxa*, 11(10):14318-14327.

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

The grant was used over the following period, and compares to the actual length of the project:

1) Identifying distribution of otters in riparian habitats (October and November 2018).
2) Collect qualitative data on communities' knowledge, attitudes and perceptions towards otters through social science survey (30 days; November and December 2018).
3) Preparation of an updated location map identifying existing/emerging anthropogenic and climatic threats for the otter species (5 days; December and January 2019).
4) A Geographic Information System (GIS) based potential habitat map will be created to provide information on status of current/possible future habitats to be targeted for conservation efforts (45 days).
5) Conducting awareness camps for local stakeholders (28 days; February 2019).
6) Provide critical information to policy makers towards developing a targeted, species-specific conservation program – (120 days; March – June 2019).
7) Preparation of the final report for submission to funding agency – (90 days; July – September 2019).

8. Budget: 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. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Communication / telephone	70	70		The allocated amount was completely utilized

Travel (2 persons): Travel expenses for project leader and project assistant @ £110 /time /person; 3 times round-trip travel cost from place of residence to project site is about £330/ person	660	660		The allocated amount was completely utilized
Local travel expenses for 155 days during field visit time	300	300		The allocated amount was completely utilized
Accommodation: £7 per day; Food £5 per day; (Total time spent in the field will be 155 days for project leader and 60 days for project assistant)	2580	2580		The allocated amount was completely utilized
GPS unit, binoculars, maps	200	200		The allocated amount was completely utilized
Awareness/education material leaflet: 2000 copies – £50; Banner – £25; Poster: 2000 – £75; Hoarding board: 3 – £150;	300	300		The allocated amount was completely utilized
School /youth club /community teaching materials + refreshments	240	240		The allocated amount was completely utilized
Training for local community for otter sign survey + refreshments	300	300		The allocated amount was completely utilized
Stationery (Pen, pencil, photocopy paper, bag, notebook, etc.)	150	150		The allocated amount was completely utilized
Report writing	200	200		The allocated amount was completely utilized
Total	**5000**	**5000**		The allocated amount was completely utilized

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

A critical finding from the region has been the detection of smooth-coated otters from river reaches outside protected areas. Given the important role being played by the Corbett and Rajaji Tiger Reserves in safeguarding threatened species within their boundaries, it is vital for conservation strategies to also target these 'unprotected areas' to maintain linear connectivity between otter habitats. Given the existing and intensifying land use in the region, and the diminishing habitat available for otters and other riverine species, it is further critical to protect these areas through targeted and sustainable measures in the study area.

There is a need to ensure regular monitoring of the existing otter habitats by strengthening the capacities of local community members to help generate a database on the population status of otters. Engagement of local people in identification with their local wildlife and its conservation is significant as the biodiversity and ecosystem services of 'cultural landscapes' are shaped by human management. The otter conservation education programs conducted during this study resulted in a proposal to set up a community-based conservation initiative (CBCI) to monitor and report otter sightings from the area, potentially representing a way forward for achieving simultaneous otter conservation and associated ecosystem benefits for local communities. Providing this critical information to decision-makers in influential bodies at the national level and internationally could assist towards development of an otter conservation program for Uttarakhand and other similar regions.

10. 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?

The Rufford Foundation logo has been used in one of the three scientific papers published till date. The logo will also be used in the other two scientific publications. A huge publicity drive has been planned during the follow-on study in the region.

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

Nishikant Gupta (Project Leader) holds a PhD degree in Geography (Science) from King's College London, United Kingdom and has been actively involved in promoting novel strategies to protect the Indian Himalayan Rivers from anthropogenic stressors and climate change for more than ten years. He has a wide experience working in conservation projects focusing on the protection and conservation of various freshwater species, in particularly the golden mahseer (*Tor putitora* – an Endangered fish species). He has worked as a Project Scientist under the National Mission for Sustaining the Himalayan Ecosystem – one of the eight missions under India's National Action Plan on Climate Change, and led the Aquatic and Human Ecology components comprising of a team of 10 PhD researchers, and effectively established constructive ideas and solutions that met the team's objectives. Based on his river conservation work in India, he has been awarded the King's Continuation Scholarship, SSPP Research Student Small Bursaries, and Small Grants Fund for MPhil/PhD Research from King's College London; and selected as a 'Leader of Tomorrow' in 2012 and 2013 by the St. Gallen Symposium, Switzerland.

Mark Everard (Co-Investigator) is Associate Professor of Ecosystem Services at the University of the West of England (UWE Bristol), UK. He has extensive practical experience in the development and implementation of the Ecosystem Approach, including the UK National Ecosystem Assessment and Defra Natural Value Programme. He is the author of numerous books, particularly on the management of freshwater and other natural resources, and has worked on international development projects in South and East Africa, Sri Lanka, China, India and Nepal.

Vinod Belwal is the research assistant on this project. He has worked for more than 8 years on freshwater surveys and research projects in Indian Himalayan region. He has worked extensively in the protected areas in the study area.

12. Any other comments?

Anthropogenic stressors in the Himalayas over recent decades have taken a toll on otter populations. Low public awareness and a lack of routine monitoring data hamper conservation strategies. Social media have the potential to generate both positive and negative perceptions about otters among target stakeholder groups. A citizen-science approach can serve as a tool to generate vital conservation information and promote public knowledge and interest. The role of social media as a tool to reinforce contemporary conservation initiatives, advocating its stronger utilization for the potential protection of otter species in the Indian Himalayan region could be a way forward.