

## Final Evaluation Report

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Your Details	
<b>Full Name</b>	Vinni Jain
<b>Project Title</b>	Examining the Distribution and Conservation Status of Two Otter Species Across a Human-Modified Landscape in Central India
<b>Application ID</b>	32248-1
<b>Grant Amount</b>	GBP 6,000
<b>Email Address</b>	<a href="mailto:vinni.jain@cwsindia.org">vinni.jain@cwsindia.org</a>
<b>Date of this Report</b>	4th October, 2021

**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
<p>Analyse distribution and habitat-use of otters across the study area using sign surveys and determine the influence of environmental and anthropogenic factors.</p>				<p>Distribution data for otters was collected from 81 river transects of 5 km each (total walk effort – 405 km). Our target was to cover 13 forest ranges completely and two partially. Of these we covered seven completely and five partially, i.e., most of our intended study area. We were unable to access three forest ranges in the eastern side of the study area due to Naxal (insurgent) activity. Along each transect, we measured variables such as river width, stream flow, human/livestock presence, sand mining, etc. Our preliminary results indicate a high naïve occupancy of 86.4% for otters. Detailed analysis of this data and otter habitat use is ongoing.</p>
<p>Collect species-level distribution data on smooth-coated (<i>Lutrogale perspicillata</i>) and Eurasian otters (<i>Lutra lutra</i>) using camera traps and analyse species co-occurrence/overlaps.</p>				<p>We set up 52 camera traps for an average of ~25 nights each and captured 23 images of otters from 13 different locations. Most of the images appear to be Eurasian otters (<i>Lutra lutra</i>), previously considered absent from central India. Due to our low capture rate, generating true species-level estimates of occupancy using camera trap data will be challenging. We will use the camera trap detections to supplement our sign survey data. Detailed analysis is ongoing.</p>
<p>Understand patterns and drivers of human-otter interactions, perceptions, and threats using questionnaire surveys.</p>				<p>We conducted 551 questionnaire surveys in 633 villages across an area of 3,300 km<sup>2</sup>. Our preliminary results suggest that though most people (75%) have neutral (or zero) interactions with otters, many (19%) have negative interactions, particularly commercial fish farmers. Attitudes towards otters are influenced by education, occupation (fishing), and how often people encounter otters. Detailed analysis is ongoing.</p>

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

1. We planned to conduct questionnaire surveys and sign surveys across 231 grid cells of 25 km<sup>2</sup> each. However, we could not access part of the study area due to Naxal (insurgent) activity. We were nevertheless able to collect data across most of our study area and completed questionnaire surveys in 132 (57.1%) grid cells (an area of 3,300 km<sup>2</sup>) after removing 73 due to Naxal activity and 26 without accessible villages. We covered approximately the same area for sign surveys and completed 81 transects of 5 km each (total - 405 km) along riverbanks.
2. We planned on using photographs from camera traps to estimate species-level distribution (since smooth-coated and Eurasian otters cannot be distinguished from each other using tracks and scat). Despite leaving cameras for ~25 nights each, we had low capture rates. This could be due to our use of white flash cameras, which were perhaps too bright or not sensitive enough to capture otter movement. Towards the end of our fieldwork, we also set up four infrared (IR) flash cameras, which seemed to have better capture rates. However, we did not have enough IR cameras to collect fine-scale distribution data.

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

1. This is the first study to generate detailed distribution maps for otters in the Balaghat region of Madhya Pradesh. Our data shows that otters occupy 86.4% of the sites we sampled, indicating widespread occurrence in and around the Kanha-Pench corridor. The maps resulting from our study can be used as a baseline to track future changes in otter distribution due to habitat loss, fragmentation, climate change, etc. In addition, our camera traps confirmed the presence of Eurasian otters (*Lutra lutra*) from multiple locations, which indicates that they occur more extensively across central India than was previously thought. This exciting and important finding highlights how little we know about otters and can guide future research on the species. Data from the sign surveys and camera traps is currently being analysed for publication.
2. At each 100 m interval on our transects, along with otter presence we also measured anthropogenic variables which appeared to affect habitat quality. We found otter signs along rivers that had a great deal of human activity, with people fishing, bathing, cooking, washing livestock and clothes, and collecting fuelwood. This indicates a high level of spatial overlap between otters and people. Our ongoing analysis will reveal how environmental and anthropogenic variables influence fine-scale otter habitat use, thus shedding light on the factors that facilitate/impede otter occurrence in shared spaces.
3. Our 551 questionnaire surveys in Balaghat allowed us to analyse human-otter interactions in rural India. We asked people questions about the nature and frequency of their interactions with otters, conflict, threats to freshwater habitats, hunting, and attitudes towards otters. Our preliminary results indicate

that fishers tend to have negative views of otters, especially those involved in commercial rather than subsistence fishing. Negative interactions with otters (perceived loss) were reported by 19% of respondents (107), while positive interactions (perceived benefits) were reported by 7% (40). The majority of respondents (75%) either did not have interactions or had neutral ones. We found that higher education levels and frequent otter sightings were associated with positive attitudes towards otters. Based on our interviews, major threats to otters in the area appear to be hunting, declining water quality due to mining and agricultural pollutants, and a reduction in the abundance and diversity of native fish populations. Detailed analysis of this data is ongoing.

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

We interacted intensively with local people during our questionnaire surveys and collected information about their lives and livelihoods. During the ecological surveys we received assistance from ~ 20 Forest Department staff and local guides who were trained to identify otter signs, collect data and use equipment. For many, it was their first experience conducting sign surveys along rivers. We also hired and trained two local field assistants who remained with us for 6 months. They were able to learn valuable skills in team leadership, fieldwork logistics, data entry and management, and using equipment such as GPS devices, camera traps, and rangefinders. We also selected and trained 22 volunteers from various backgrounds including students, wildlife biologists, actors, IT professionals, etc. who were able to experience and learn about the people, forests, and wildlife of Madhya Pradesh. Some of these volunteers went on to obtain jobs in wildlife conservation institutions as a result of this fieldwork.

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

I would like to continue this work in Madhya Pradesh and other landscapes to obtain a deeper understanding of otters and their adaptations in human-modified environments. Some of the topics I look forward to working on include spatio-temporal activity patterns of otters living alongside people, seasonal shifts in otter habitat use, evolutionary/genetic relationships between sub-populations, the effect of invasive and commercial fish species on otters and their habitats, and more.

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

Our findings will be published in 1-2 peer-reviewed journal articles. We will also summarise the results in a report with guidelines for the Forest Department and other local stakeholders. In December 2021, I will be presenting the results of this project at the 30<sup>th</sup> International Conference for Conservation Biology (ICCB).

**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 between August 2020 and August 2021 in accordance with the anticipated project length, despite the COVID-19 pandemic.

**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
Field Assistant Salary	3,885	3,885		
Food	500	500		
Fuel for Jeep	966	966		
Field Station Rent	649	649		
<b>Total</b>	<b>6000</b>	<b>6000</b>		Total project costs were co-funded by Centre for Wildlife Studies.

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

The next steps are to complete the analysis and publish our results in peer-reviewed journals and condense them into a report for the Madhya Pradesh Forest Department. We will also include guidelines for the preservation of otters and freshwater ecosystems in the region based on our results.

**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 has been credited by name and logo in the Centre for Wildlife Studies (CWS) annual report, donor reports, and the CWS website. We will also include the RF logo in all future publications, reports, and presentations.

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

**Dr. Krithi K. Karanth** – Supervisor

**Biddappa PA** – Project/Fieldwork Coordinator

**Utkarsh Kachwaha** – Field Assistant (~6 months)

**Aditya Meravi** – Field Assistant (~ 6 months)

**Sahil Pimpale** – Data Collection (~ 4 months)

**Sneha Kalpande** – Data Collection (~ 4 months)

**Jyoti Patale** - Data Collection (~ 4 months)

**Nikhil Jambhale** – Data Collection (~ 4 months)

Volunteers (~ 2 weeks each): **Abhi M R, Anish Banerjee, Anshita Das, Arjun Kindra, Charu Sharma, Dhanush Dev, K. Dolsy David, Kumar Anirvan, Lakshman Gunukula, Mohit Singh, Mudra Joshi, Namratha Murali, Pranay Bhatnagar, Pranjal Vaid, Rachit Kumar, Sabiya Sheikh, Shivani Deshpande, Shravan Ram, Tahir Multani, Vedant Sapra, Vikram Singh, Yashaswi Garg**

**12. Any other comments?**

I would like to thank the Rufford Foundation for their funding and support.