Final Evaluation Report

Your Details	
Full Name	Nischal Shrestha
Project Title	Science meets Communities: Working Together for Chinese Pangolin Conservation in Kavrepalanchok, Nepal.
Application ID	41455-2
Date of this Report	20th March, 2025

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
Camera trap-based occupancy modelling			■	Occupancy of Chinese pangolin was estimated along with the covariates that influenced the occupancy of Chinese pangolins which provided crucial insights for developing effective conservation strategies, supporting decisions about policies, and protecting the associated habitat and ecosystems.
Habitat and climate change impact modelling			■	Chinese pangolin habitat distribution, along with the impacts under climate change on their habitat was determined which has helped to identify crucial and understudied area for species survival where scientific and conservation efforts are required.
Capacity Building			■	The project placed significant importance on community involvement, conducting a workshop for capacity building sessions benefited over 75 individuals, and stakeholder meetings emphasised the need for a land use action plan to prioritise forest and biodiversity conservation within the administrative regions and the district. Overall, the project successfully engaged the community and raised awareness about conservation efforts reaching over 1000 individuals in total.

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

a) Advancement in Pangolin Ecological Understanding and Monitoring:

- The project made a significant breakthrough in understanding the ecology of Chinese pangolins in Nepal by successfully implementing camera trap-based occupancy modelling on a broad scale—an approach rarely applied to this elusive and nocturnal species.
  Key accomplishments and findings from the camera trap surveys include:
  - Camera Trap Effort: A total of 1,222 camera trap days were recorded across 57 sampling plots within 20 community forests in Kavrepalanchok district.
  - Pangolin Records: The survey yielded at least 26 independent events of Chinese pangolins, resulting in a capture rate (or Relative Abundance Index) of 2.128 per 100 camera-trap days.
  - Pangolin Detection Sites: Chinese pangolins were detected in 12 plots, spread across 9 community forests (Thuloban CF (Nala), Hile Jaljale 'Ka' CF, Dovan Chuli CF, Pyangal Khola CF, Ganeshthan Bhimsensthan CF, Chapani CF, Thulo Bhir CF, Dharapani CF and Paleko CF).
  - Behavioural Observations: Nocturnal activity patterns were documented between 1900 and 0400 hrs, including sniffing, digging, gathering plant materials, and cautious burrow exit behaviour.
  - Ecological Insights: Occupancy probability was significantly influenced by the presence of termite mounds/ant colonies ($\beta = 2.315$), increasing distances from roads ($\beta = 2.066$), and decreased with proximity to human settlements ($\beta = -2.0318$). Overall, the model-averaged site use probability was estimated at 0.4671 ± 0.1188 SE, over twice the naïve occupancy.
- Furthermore, the project validated the effectiveness of camera traps as a reliable monitoring tool, establishing a replicable methodology for future research and conservation efforts, both within Nepal and potentially in other regions.
- The project successfully mapped and identified potential habitats for Chinese pangolins within Kavrepalanchok district, delivering critical spatial insights for targeted conservation. Using the MaxEnt ecological niche modelling, the team integrated occurrence data from both primary (camera trap) and secondary sources along with topographic and bioclimatic variables to model current and future habitat suitability.
  Key findings include:
  - Under current conditions, approximately 192.72 km² of the district was identified as highly suitable habitat, while an additional 254.58 km² and 189.94 km² were classified as moderately and marginally suitable, respectively.
  - The most influential environmental predictors were annual precipitation (BIO12), precipitation of the driest month (BIO14), and land-use/land cover. Elevation and temperature variables also played important roles.
  - Future projections under climate change scenarios (SSP2–4.5 and SSP5–8.5 for 2021–2040) predict alarming habitat loss:
    - Under SSP2–4.5, highly suitable habitat is expected to decline by 61.2%, reducing to 74.83 km².

- Under SSP5–8.5, a 63.7% reduction is projected, with only 70.07 km² remaining as highly suitable.

- These findings indicate that precipitation variability and land-use changes, compounded by rising temperatures, will substantially shrink suitable habitats, thereby increasing fragmentation and isolation risks for pangolin populations.

b) Empowered Local Communities Through Capacity Building and Awareness:

- A crucial achievement was the extensive training provided to over 76 local community members, equipping them with essential skills in pangolin research and biodiversity conservation.
- Simultaneously, awareness campaigns successfully engaged over 800 individuals, fostering a deeper understanding of pangolin importance and promoting active participation in conservation initiatives.
- This capacity-building effort addressed the critical shortage of skilled personnel in wildlife monitoring, creating a network of informed and capable individuals dedicated to the long-term protection of pangolins and their habitats.

c) Tangible Conservation Outcomes through Collaborative Action:

- The project catalysed direct conservation actions through collaborative efforts with local communities, forest user groups, and government authorities.
- These actions included the promotion of habitat conservation and sustainable management through community-based initiatives and site-specific action plans, restricting activities that harm pangolin habitats.
- The project also fostered community-based conservation, and knowledge sharing through collaboration with national and international organizations.
- This collaborative approach has strengthened conservation efforts throughout the species' range.

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

Although we maintained a constant fear of losing camera traps during the survey, we were fortunate enough not to lose any equipment or data this time. We had optimized from previous lessons learned and ensured proper monitoring and safety measures were in place. But two significant unforeseen difficulties affected our project:

- First, we experienced delays in acquiring necessary permits from the Department of Forest and Soil Conservation for conducting camera trap surveys in Kavrepalanchok's community forests. This administrative hurdle shifted our entire project timeline.
- Second, the monsoon season brought severe natural calamities, particularly landslides and floods, which caused substantial damage to our study areas. These weather-related challenges further delayed our field activities and data collection since these areas were inaccessible.

While these obstacles extended our project timeline beyond initial expectations, we adjusted our schedule accordingly and maintained communication with stakeholders about the revised timelines. Originally planned to begin on 15th November 2023, the project officially commenced on 9th February 2024 following

grant approval, with field implementation starting after permits were obtained in April 2024. Consequently, the project was extended through 30th March, 2025 to accommodate delays caused by permit acquisition and adverse monsoon-related conditions, such as floods and landslides. These delays directly contributed to the decision to hire the Research Assistant for 5 months instead of the initially planned 3 months, ensuring continuous support during the extended fieldwork phase. We prioritized safety during adverse weather conditions and worked closely with local officials to navigate the permit process as efficiently as possible under the circumstances. Nonetheless, despite these unforeseen challenges, we successfully completed all project activities as planned.

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

Our project actively engaged local communities through multiple channels, providing them with significant benefits.

- We conducted capacity building training for 49 local forest guards and youths from thirty-one community forests, alongside 27 local individuals from the four administrative regions of Kavrepalanchok district, equipping them with crucial skills for wildlife monitoring, particularly focused on pangolins. Participants learned to respond effectively to pangolin-related incidents by contacting appropriate authorities including local officials, wildlife experts, Division Forest Offices, and local police.
- Our awareness initiatives reached more than 800 people, including students, teachers, and community members. This knowledge empowered locals to make informed decisions and contribute meaningfully to conservation efforts. By developing this local expertise, we've created a sustainable foundation for ongoing conservation work within the community.
- We organized community awareness sessions and stakeholder meetings that brought together government representatives, school officials, local leaders, and other key stakeholders. These forums facilitated important discussions on topics including the development of comprehensive land use policies that properly incorporate forests and wildlife conservation. This collaborative approach ensured that policy development considered diverse community perspectives and interests.

Through these integrated strategies, the project fostered community ownership of conservation initiatives while building local capacity for sustainable wildlife protection.

5. Are there any plans to continue this work?

Yes, I am committed to continuing this research. My initial project successfully laid a vital foundation by establishing baseline data on Chinese pangolin populations and identifying key habitats within the district's forest patches. Building upon this, I recognize the urgent need to broaden my investigation along the Arniko Highway, a critical conduit for illegal pangolin trafficking into China. Therefore, my future research will extend beyond the current district, encompassing multiple districts and administrative regions along the highway. This expansion will enable me to gather crucial data on pangolin presence, distribution, habitat needs, and, most importantly, their vulnerability to the illegal trade across a wider geographical area. By focusing on these high-risk zones, I aim to bridge critical knowledge gaps

regarding local pangolin populations and gain deeper insights into the complex trafficking networks that threaten their existence. The data obtained will be instrumental in developing evidence-based conservation strategies that address both habitat protection and anti-trafficking measures. Ultimately, this continued effort will significantly contribute to the long-term conservation of Chinese pangolins and strengthen the fight against illegal wildlife trade in the region.

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

I've established a thorough strategy for disseminating my work results and findings. My approach includes multiple components:

- I've created informative videos that showcase my research outcomes and discoveries. These videos provide an accessible format for communicating my findings effectively. I've distributed them across various social media channels to connect with diverse audiences, including community members, conservation groups, and other interested parties.
- I've developed a comprehensive report documenting my research process, methodologies, and results. This document contains specific conservation and management recommendations based on my findings. I've distributed this report to key stakeholders including the Department of Forests and Soil Conservations, Division Forest Office, local municipalities and rural municipalities, ward offices, and community forest user groups. This targeted distribution ensures my research reaches decision-makers and community leaders who can help implement the suggested recommendations.
- For academic purposes, I'm currently working on scientific publication based on my project outcomes. These will provide researchers, scholars, and conservation professionals with access to my detailed findings, facilitating further scholarly discussion and advancement in this field.

Through this diversified approach, I seek to optimize the reach and influence of my work across different audiences—from local communities to policy officials to scientific experts—encouraging collaboration, information sharing, and evidence-based decisions that will support Chinese pangolin conservation and sustainable resource management.

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

Moving forward, I believe several key steps are critical to advance conservation efforts.

First, I aim to expand my research into underserved areas within the districts along the Arniko Highway. This highway is especially significant as it serves as a known conduit for illegal wildlife trafficking into China. By systematically assessing pangolin presence, distribution patterns, and habitat characteristics in these strategic areas, I can gather vital data that directly addresses both conservation and anti-trafficking efforts.

My comprehensive research along this corridor will provide crucial insights into:

- How pangolin populations are distributed in proximity to trafficking routes.
- Which specific habitat areas are most vulnerable to poaching.
- How local communities near the highway might be engaged in protection efforts.
- What intervention points exist for disrupting illegal trade networks.

Additionally, building stronger collaborations with local communities, conservation organizations, and stakeholders remains essential for success. By working together, I can leverage diverse resources, share specialized expertise, and implement more effective conservation strategies that address both habitat protection and illegal trade concerns.
Continuing the awareness and education initiatives with stakeholders about the importance of pangolin conservation is vital for fostering community support and stewardship. This is particularly important in communities along the Arniko Highway, where increased awareness can lead to greater vigilance and reporting of suspicious activities.
Through these integrated next steps, with special emphasis on the strategic location within multiple districts, I believe I can make significant contributions to both the long-term conservation of Chinese pangolins and efforts to combat the illegal wildlife trade threatening their survival.

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?
The Rufford Foundation logo was integral to my project's visibility and recognition. It was consistently displayed on all project materials, including comprehensive reports, informative educational brochures, and prominent flex displays. Official documentation, bearing the logo, was submitted to key stakeholders, such as the Department of Forests and Soil Conservation, various Division Forest Offices, administrative regions, and community forest user groups. Over 1,000 individuals received the logo-branded brochures, which were also distributed to government and local officials, including those at the ward level. Furthermore, the logo was featured in awareness presentations delivered to approximately 800 students.
I plan to acknowledge The Rufford Foundation in forthcoming scientific publications, which will enhance the Foundation's visibility within academic circles. Additionally, all reports and materials will be shared with the IUCN Pangolin Specialist Group and made accessible on our organization's website, extending the Foundation's reach and recognition.
These materials effectively served a dual purpose—delivering crucial project information while simultaneously showcasing The Rufford Foundation and its mission. Through this widespread distribution across various platforms and stakeholder groups, the Foundation received considerable exposure throughout the duration of my work.

9. Provide a full list of all the members of your team and their role in the project.
Project Team Members and Roles:

- Nischal Shrestha (Project Lead) - Managed the overall project implementation, including fieldwork, data analysis, awareness campaigns, capacity building workshops, and report writing.
- Sandeep Shrestha - Served as co-lead for project design and implementation.
- Ashish Bashyal - Supervised project execution with particular focus on design, methodology development, and data analysis.

- Saneer Lamichhane - Contributed significantly to project design and data implementation.
- Ishan Subedi - Played a vital role in fieldwork execution, data management, and facilitation of capacity building workshops and awareness programs.
- Sujan Prakash Pradhan - Handled project documentation, capturing essential photographs during field activities and awareness initiatives.
- Division Forest Office, Kavrepalanchok - Forest officers provided crucial information on potential pangolin habitats and observation sites.
- Administrative Region Officials - Provided contact information for community forest user groups who were essential to the research process.
- Local Field Support Team - Assisted with fieldwork implementation across various forest areas within the municipality.

10. Any other comments?

Our project has shown how important it is to keep expanding our conservation work. We need to develop similar projects in other parts of the district and across the country, especially in areas along the Arniko Highway where pangolins are often trafficked.

We've learned that good conservation needs several approaches working together - scientific research, getting communities involved, and building partnerships. By expanding our work to more areas, we can better protect Chinese pangolins and help more people understand why they matter.

What we've learned from this project gives us a good starting point, but real conservation success needs ongoing commitment. Our findings show that focusing on high-risk areas, particularly along trafficking routes, could really help protect pangolins and stop illegal wildlife trade.

I want to sincerely thank The Rufford Foundation for supporting us throughout this project. Their help has made a real difference in our conservation efforts and has helped build local skills that will continue to benefit pangolin conservation for years to come. The Foundation's support for evidence-based conservation work has been crucial in allowing us to do this important research and community work.