I am pleased to submit this progress report for the project supported by Rufford Foundation. The overarching aim of the project is to examine genetic structure, and potential contact zones of the golden langur (*Trachypithecus geei*) and capped langur (*T. pileatus*) within Bhutan. The initial phase of the project, supported by Rufford Foundation, has focused on completing extensive field surveys, initiating laboratory analyses, and undertaking community and academic outreach.

Fieldwork Summary

Between January 2023 and May 2024, I successfully completed three seasons of full fieldwork component of the project across key districts. For the first season, field work was conducted in Zhemgang and Trongsa, for the second season in Tsirang and Sarpang, and finally for the last season, in Pemagatshel, Mongar, Trashigang and Samdrupjongkhar. Activities included:

- ✓ **Sample collection (non-invasive):** Collected 180 fecal samples for downstream genetic analyses focusing on population structure, connectivity, and demographic history.
- ✓ **GPS data collection:** Recorded high-accuracy GPS points for all observed groups, habitat condition, and group characteristics for each sample.

Fieldwork proceeded without major interruptions, and almost all planned sites were surveyed.

Preliminary Observations

Although detailed analyses are ongoing, several preliminary patterns have emerged:

- ✓ **Potential contact zones** between the two species were noted along Mangdechu River which is one of the major tributaries of Manas River in locations such as Dunmang Hotspring and Tingtibi, warranting further genetic and ecological investigation.
- ✓ Community interactions suggest seasonal shifts in langur movement linked to crop availability and local land-use patterns.

These observations will be validated through genetic analyses and species distribution modelling in the coming months.

Laboratory Work and Genetic Analysis

Since returning from the field, I have begun laboratory processing of collected samples. Completed and ongoing activities include:

- **DNA extraction** from fecal samples using method prepared by Kawamoto et al. (2013)
- **PCR amplification** initiated for mitochondrial and nuclear markers relevant to population structure and phylogenetic reconstruction.
- **Quality control checks** performed to evaluate DNA yield and inhibitor presence.
- Preliminary mitochondrial DNA **sequencing** completed and **genotyping** efforts underway, with full datasets expected in the next reporting phase.

These analyses will help determine genetic differentiation between populations, identify potential admixture zones, and reconstruct historical demography.

Outreach and Academic Engagement

As part of the project's knowledge dissemination goals, an outreach initiative was carried out in collaboration with my PhD Supervisor, Dr. Praveen Karanth. This involved visiting two colleges under the Royal University of Bhutan: College of Natural Resources and Sherubtse College.

- ✓ Delivered talk titled "Introduction to langurs in Bhutan and langur phylogeny".
- ✓ Engaged with undergraduate students from environmental science, forestry, and life science programs.
- ✓ Discussed the significance of genetic research in informing conservation planning for Bhutan's primates.
- ✓ Conducted Q&A sessions addressing conservation challenges, species boundaries, field research methods, and emerging genomic tools.

The outreach activities were well received and helped promote primate conservation awareness among young Bhutanese scholars and faculty members.

Challenges Encountered

A few challenges were noted:

- **Logistical delays** due to difficult mountain terrain in certain forested regions
- **Seasonal delays** as field works could only be conducted in dry seasons.
- **Variable fecal sample quality** posed expected limitations for DNA extraction success.
- Occasional **difficulty in locating langur groups** in densely forested habitats and losing samples in the dense undergrowth.

These issues were proactively managed and did not impede the completion of the fieldwork.

Plans for the Next Reporting Period

The next six months will focus on:

- Completing all genetic extractions, amplifications, sequencing, and dataset validation.
- Conducting integrative analyses combining ecological, spatial, and genetic findings.
- Preparing manuscripts for peer-review and compiling conservation recommendations for relevant Bhutanese agencies.
- Continuing outreach through seminars, workshops, or community discussions where appropriate.

Acknowledgements

I express my sincere appreciation to Rufford Foundation for supporting this research. The funding has been instrumental in enabling rigorous fieldwork and fostering scientific engagement within Bhutan. I look forward to presenting the final findings and contributing to the wider understanding and conservation of langurs in Bhutan.