

Final Evaluation Report

Your Details	
Full Name	Ram Mohan
Project Title	Acoustics and conservation: Bats and birds in semiarid landscapes
Application ID	29441-1
Grant Amount	£5,984
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Date of this Report	24-10-2021

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
Passive acoustic monitoring at waterholes and adjacent semi-arid habitats for quantifying bat diversity and activity patterns				We were able to record over waterholes and grassland habitats in November 2019, March 2020 and January 2021.
Locating and monitoring roost sites for bats and building a call library for desert species.				Due to unforeseen circumstances due to Covid 19 pandemic, we were unable to continuously monitor and search for bat roosts.
Establishing an acoustic monitoring paradigm for birds in Northwest Indian thorn scrub forests and semi-desert grasslands.				We were successful in establishing an acoustic monitoring paradigm in different kinds of grassland habitats, the results of which have been published in two peer-reviewed publications.
Quantifying acoustic community diversity and dynamics in these habitats.				We were able to successfully quantify the acoustic community diversity in our grassland habitats.
Studying habitat occupancy and associations with anthropogenic activity for threatened and endemic bird species and identify priority areas for their conservation.				We have some preliminary evidence for species association with certain habitats, indicating spatial heterogeneity in species distribution. Information from the 2021 fieldwork as well as future data collection efforts will lead to a comprehensive understanding of how grassland species are associated with different kinds of habitats.
To develop the threatened, White-napped tit (<i>Machlolophus nuchalis</i>) of thorn scrub and Stoliczka's Bushchat (<i>Saxicola macrorhynchus</i>) of semiarid grasslands as flagships of their respective habitats for awareness and conservation.				Although we were unable to locate the bushchat, we were able to survey additional sites where the bushchat is found. With the help of local bird experts, we have some preliminary ideas of their seasonal movement as well as habitat preference. This will help expand into our long-term monitoring work.

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

Our research timeline and fieldwork were negatively affected due to the coronavirus pandemic. This resulted in a major shift in sampling seasons and difficulty in access to study areas.

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

Firstly, for bats, our study finds that small water bodies are important geographical features that attract most bat activity in a semi-arid landscape. Hence, such water bodies are of conservation priority.

Secondly, bat and bird communities in the landscape were affected by seasonal changes. The region experiences an influx of birds in the winter and bats were observed to be less active during peak winter.

Lastly, our study on birds helped to quantify, standardise and publish methods for quantifying acoustic communities as well as a methodology pipeline for long-term monitoring of acoustic communities across multiple spatio-temporal axes. This pipeline can help in future studies in different kinds of habitats as well, as we aim to expand the scope of this current project. Our bird component also shed light on the natural history and distribution of the Stolickza's bushchat, and this information gathered with the help of local field collaborators will be useful as we scale up to study this species and its conservation biology.

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

During the course of this project, we involved the forest department who are stakeholders of our study areas. The forest department officials not only helped us with the planning and logistics, but also were key informants about locations to survey when we were preparing our study design. We have also made efforts to conduct workshops with officials from the forest department in bird identification, which were helpful for them to do more comprehensive bird monitoring.

In November 2019, interaction with local communities was involved in order to locate bat roosts in the villages. Villagers and the estate owners of the roost site whom we interacted with were informed about the importance of bats in the ecosystem and promoted their tolerance towards bats occupying their estate. Involving the communities were largely hampered by the pandemic and mostly, efforts were made in collaboration with the forest department to prevent retaliation of the public towards bats by the help of digital media.

As part of our remote data collection efforts at Desert National Park, we hired local bird guides and experts to survey for the Stolickza's Bushchat starting June 2021. They were instrumental not just in helping us broaden our research objectives and help with

data collection, but also helped with giving us a lot of valuable information on species natural history and new locations where our species of interest could be found. These experts were paid by us during the pandemic, and we hope to keep them involved as our project broadens in the future.

5. Are there any plans to continue this work?

The research will be continued in a future time frame, since the lab at the institute is currently being prepared to be shifted. The research is planned to be continued to address new questions using integrative tools. This will enable us to better understand ecological processes in semi-arid lands.

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

We have currently published two research articles on birds based on our research. We expect to publish a third research article from our bat research data in the upcoming months.

Additionally, Sutirtha Lahiri has written and published public outreach reports and articles of our research. We also expect to present our findings in scientific conferences.

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 from November 2019 to August 2021. Our plans that were proposed prior to fieldwork experienced major changes after the first season of data collection in November 2019. The project was expected to be concluded by the end of the year 2020. We had to extend our study until August 2021 to complete our project.

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
Institutional Overhead	285	285		
Food for 3 persons	432	432		
Lodging at site for 3 Persons	647	647		
2 Unit of Headlamps	32	32		
2 units of flashlights	17		-17	

1 unit of Kestrel data loggers	129		-129	We had purchased a GPS instead, after consulting Rufford staff. Additionally, we needed a rucksack and a sleeping bag during the latter phase of the project when we surveyed in peak winter in the month of January 2021.
4 unit of Wildlife Song Meter with microphones	1175	1175		
3 Units of Wildlife Acoustics Song Meter	1762	1762		
Field Assistant Salary	353	353		
Fuel for motorcycle	35	35		
Second-Hand/Rental motorcycle	200	200		
Car travel to Field site	353	353		
Air travel	564	564		
Miscellaneous field expenses (GPS, rucksack, sleeping bag, equipment batteries)		146	+146	
Total	5984	5984		Total = £5,984 (Received INR 540865.16) (Based on exchange rates of 1£=90.49 INR)

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

Our project highlights a paradigm by which we can set up a long-term monitoring programme in these semi-arid landscapes. This is the major long-term goal of our project and will be implemented in a manner that encourages participation by multiple stakeholders.

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?

We have acknowledged the Rufford Foundation in our research articles and used the logo in the workshop we conducted. We will be mentioning the Foundation's name and using the logo in upcoming conferences where we will present our work.

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

Mr. Ram Mohan- Headed in bat research and outreach components of the project

Mr. Sutirtha Lahiri- Covered the bird monitoring and outreach-education components of the project.

Dr. Anand Krishnan- Supervised Ram and Sutirtha during the course of this research.