

Final Evaluation Report

Your Details	
Full Name	Monica Kaushik
Project Title	Role of urban green spaces for conservation of bird diversity in the rapidly urbanizing capital of Himalayan state of Uttarakhand, India
Application ID	26698-1
Grant Amount	£5000
Email Address	monica.monica@fulbrightmail.org
Date of this Report	2 nd January 2022

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
To understand the macro and micro-scale features of UGS that affect bird functional diversity				We quantified the patch size and land cover type in the surrounding matrix around selected urban green spaces, and vegetation within each green space. We found the overwhelming role of patch size in shaping the bird species richness, density, and richness of fine foraging guilds. We also found the important role of tree species richness at the local scale in positively influencing the bird community and guild characteristics.
Investigate the role of native versus exotic vegetation (trees and shrubs) on the overall bird functional diversity				We did investigate the effects of native and exotic plant richness on the bird community level. We found that native tree richness had a non-significant positive impact on the breeding bird community.
To connect different UGS users with green spaces and birds for creating a sense of ownership				We did conduct bird walks for a few urban green spaces but we could not conduct outreach activities for all green spaces. The main reason for this was finding a contact person, especially within residential areas and offices, to connect us to the larger group. However, we presented our results at two national conferences (SCCS, Bangalore, and national symposium on avian biology, Haridwar) and an online platform.

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

Change in grant disbursement policy from proposal submission to the result announcement resulted in initial delays of the project work. The host institutions had little experience working with foreign funding, and it affected the work. However, we managed to carry out the study as proposed.

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

1) Our findings established the distinct role of landscape and local scale variables in shaping the urban bird community. This finding confirms a hierarchical part of urban green space planning and management to improve and sustain bird richness.

2) Size of urban green spaces emerged as a crucial predictor of the richness of plants and birds. This result agrees with the studies conducted in temperate and tropical regions and emphasises the role of large green spaces for conserving urban biodiversity.

3) Another important finding of this study is the overwhelming role of tree species richness in improving the bird community characteristics at all levels (community, guild, and species). In already planned cities with no scope of designing large green spaces, aiding vegetation structure and complexity via periodical planting of native vegetation or supporting natural regeneration could support more bird species. Urban park managers should pay particular attention to retaining the native and large old trees to improve the biodiversity potential of the green spaces. Exotic ornamental plants do not have much dietary value to the native avifauna. Native fruiting plant species supported higher richness of birds.

4. What do you consider to be the most significant achievement of this work?

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

As our study is conducted in the urban Dehradun, it was vital for us to seek the help and support of the local stakeholders. We took help from the local expert and residents of Dehradun to finalise the list of sampling locations by understanding the vegetation, access, age of establishment, and critical birds in shortlisted sites. Before starting the sampling, we visited selected green spaces and discussed our study to seek their permission to conduct our research. We carried out birdwatching sessions for the green spaces within the educational institutions. We carried out such sessions for younger students below the 5th standard and the students pursuing higher education. We met enthusiastic urban residents who took our suggestions for selecting plants for their yards and domestic gardens to improve bird diversity in their backyard.

6. Are there any plans to continue this work?

The research is still going in the study area. We investigated the bird community characteristics in the urban matrix and compared it with the urban green spaces this year. However, we could not collect the required temporal replicates due to the pandemic but we wish to continue research within urban green spaces and the surrounding matrix in coming years. We want to expand by asking question on adaptations by birds in urban areas and the role of citizens in monitoring urban birds. We also want to investigate the role of private green spaces for urban birds.

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

We have already published one research article (<https://doi.org/10.1007/s11252-021-01165-9>) and presented the findings at international and national conferences. We expect to publish two more articles from this work, out of which one is in the final stage of writing.

Ms Samakshi Tiwari presented the findings of the non-breeding season at the “Entangled Nature” conference held at Ambedkar University Delhi in 2019.

Ms Manisha Kumari presented a poster on the findings of the breeding bird community at the “Student Conference on Conservation Science,” Bengaluru, in the year 2019.

Monica Kaushik presented the findings of this study at the “National Symposium on Avian Biology,” Haridwar in 2021.

Additionally, Monica Kaushik shared the findings through an online platform during “wildlife week” (<https://www.youtube.com/watch?v=15jksuM-iCw>).

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

As we started the project before receiving the funding with limited resources and through the help of our collaborators therefore, we managed to finish the project as per the proposal. But the final evaluation report submission got delayed due to the pandemic.

9. 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
Post Field Work-Report writing and printing	56	36	-20	
Wages	1341	1341		
Outreach material	473	400	-73	We spent slightly less than expected on outreach material as we conducted more bird walks and talks.
Field supplies- Communications	30	50	+20	We spent more on communication than

				expected due to more communication during outreach activities.
Field Supplies-Stationery	11	11		
Field Supplies-Data storage	45	45		
Field Supplies- Field Notebooks	17	17		
Field Supplies-Field Guide	8	8		
Transportation-Reconnaissance Survey	89	89		
Transportation-Local transport-	858	931	+73	More money was spent on local transport due to sudden increase in vehicle rent
Field Supplies- Field Guide (Birds)-2 units	18	18		
F i e l d S u p p l i e s - B a t t e r i e s -				
F i e l				

d e q u i p m e n t				
L i v i n g e x p e n s e s - F o o d				
L i v i n g e x p e n s e s -				

R e n t i n g a c c o m m o d a t i o n				
T o t a l				

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

This study focused on habitat size and tree species richness as factors shaping bird community. Our findings emphasise the role of city planning by incorporating large sized parks for improving bird diversity but the bird diversity potential of existing city parks, with lowest bird diversity could be enhanced by vegetation enrichment.

Noise and light pollution in addition to the invasive predators are novel stress for the urban bird diversity and we plan to investigate their independent and interactive effects on bird community in urban areas.

Urban green spaces are an essential part of urban planning; understanding their ecological role on bird's competitors and predators can improve and reduce consequences, especially in rapidly urbanizing biodiversity hotspots. We want to design a long-term monitoring of these green spaces using existing citizen science program.

11. 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 are grateful to The Rufford Foundation for the financial support for our proposed study and we are proudly acknowledging the same by using foundation's logo for the outreach activities and the presentations at national and international conferences. In our published research paper, we declared The Rufford Foundation as funding agency of the work and duly mentioning our grant ID (Grant ID: 26698-1).

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

Monica Kaushik: Principal investigator of the project. I designed the study, managed the permissions, trained interns for data collection, facilitated field work and lead the manuscript writing and outreach (2018- till now).

Samakshi Tiwari: played a crucial role in helping with brainstorming while study design and collected data for the non-breeding season. She conducted bird walks in research institutions (2018-2019).

Manisha Tiwari: helped in collection of data during breeding season (2019) and conducted outreach activities and bird watching sessions for school kids (2019).

Dr. Hukum Singh: was the advisor and he facilitated the liaising with the Forest Research Institute as well as facilitated the formal recruitment of the researcher for this study.

13. Any other comments?

Thank you, Rufford Foundation, for supporting the work and laying foundation to the urban ecology work in Uttarakhand.