Final Evaluation Report

Your Details	
Full Name	Helen Taylor-Boyd
Project Title	Bat Biodiversity, Ecology and Conservation in Zambia
Application ID	25834-B
Grant Amount	£10,000
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Date of this Report	30th March 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
1) Research - Examine the effects of agricultural practices on bat species assemblages, activity levels and habitat use, and investigate the ecological roles that bats play in farming ecosystems, such as predation of insect crop pests (to be achieved through systematic acoustic surveys, bat trapping, dropping collection and insect trapping in agricultural sites). Examine the perceptions of bats within the industry sector, and the agricultural practices in use which could have a potential impact on bat populations (to be achieved through agricultural practitioner questionnaires)				Acoustic and insect assemblage data has been collected for all study farms and fieldwork for this aspect of our research work has been completed. Analysis is well underway. Questionnaires for farmers were not collected as randomised sampling methods are being developed to sample a range of small- and large-scale farmers who can access the questionnaire to avoid bias. Genetic analysis was delayed due to sample export permit and Covid 19 delays and so funding for this aspect was reallocated to a second fieldwork season as approved by the trustees. Samples have now been processed by collaborating lab in Portugal and are being analysed.
2) Training - Train local field assistants to enhance data collection during the project and facilitate a legacy of research capacity in the future. Train local bat workers so as to increase the capacity of outreach activities.				Several volunteers have joined the project for shorter periods but one (Bernard) has remained long term as the project research and outreach assistant. Despite starting an agricultural management college course, he has remained dedicated to the project. In addition, three students at the University of Zambia have already carried out projects in collaboration with us to collect data on bats in urban landscapes. Both them and their supervisors have received training on bat biology and ecology, acoustic survey techniques

				and data analysis.
3) Community engagement activities - Deliver educational presentations and activities to the general public and schools to improve public knowledge of bats. Carry out roost and landowner visits to advise residents on living with their bats to reduce human-bat conflict.				Public awareness talks have been delivered to schools and to the general public. This also included a workshop for the Zambian Environmental Management Agency to increase awareness of the importance of including bats in environmental impact assessments. Roost enquiries and visits have been increasing due to increased awareness by word of mouth and on social media. An information booklet to raise awareness of the importance of bats and how to live with them has been printed and is being distributed to roost owners and at events.

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

There were unforeseen circumstances relating to the export of samples to the collaborating lab in Portugal. This caused delays which meant that the funding allocated to genetics had to be reallocated to a second field season with permission granted by The Rufford Foundation trustees. This was very much appreciated as it allowed us to complete more research and outreach work. Covid 19 resulted in less face to face work but with more people going online we have been able to maintain an online presence and deliver more online talks.

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

1) Scientific knowledge – Our bat records have already been contributing to increasing the knowledge of distributions of species as they have been contributed to the GBIF data mobilisation project. These records are openly accessible in the hope that they will be used by students, researchers, professional ecologists, conservationists and government departments. In addition, the data collected from agricultural landscapes is being analysed and draft scientific papers being prepared to increase the understanding of bat ecology and ecosystem services in human-dominated areas.

2) Awareness – More than ever, it is a time when the myths surrounding bats need to be dispelled to maintain the ecosystem services they provide and to reduce human-bat conflict. Through a constant presence in the form of talks, social media and publications we feel that we are making progress in changing attitudes towards bats. Perhaps our greatest achievement has been developing a relationship with the Environmental Management Agency who review Environmental Impact Assessments to ensure that bat surveys are taking place and that they are valued as biodiversity.

3) Capacity building – Volunteers and students have gained valuable skills, knowledge and networking opportunities through the project. Our longest standing volunteer Bernard has come on leaps and bounds and has even represented the project at the Rufford Conference in Livingstone. The workshop for the Zambian Environmental Management Agency has increased knowledge of bats and how to survey for them with regard to Environmental Impact Assessments which is becoming ever more important with wind farm developments being proposed for Zambia potentially having an impact on bats.

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.

Public awareness talks and roost visits have enabled us to communicate the ecosystem service value to local communities and reduced human-bat conflict. Field assistants come from local communities and benefit from building up skills and experience as well as career development opportunities.

6. Are there any plans to continue this work?

Yes, there is still more to do about the data analysis work as well as with publishing the results. We also need to maintain our outreach work and capacity building to ensure that human-bat conflict continues to reduce, and that the importance of bats is acknowledged. We need to reach as many people as possible, from government to local academics and teachers to the general public.

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

I will be completing the PhD work which will lead to several publications based on the agricultural landscapes research. Bat records will also be shared with citizen science projects and to an open access database in collaboration with Bats without Borders. The information gathered will be shared directly with the land and roost owners themselves so that they are aware of their bats and how to protect them. Results will also be used when developing outreach materials.

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

The project timescale was extended from October 2019 with permission from The Rufford Foundation trustees due to delays with genetic analysis work and so the grant was used to cover two fieldwork seasons from October 2018 to March 2020. The small balance of the grant allocated to printing the booklet was finally used by March 2022 as very little in-person work could be carried out during covid 19.

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. *ZMW15=£1 – except for printing later in 2022 at ZMW22=£1

Item	Budgeted Amount	Actual Amount	Difference	Comments
Genetics	5500	188	-5312	Agreed with RF for change of use
Licences & Courier Fees	300	119	-181	Research and sample export permits were under budget and courier fees were covered by the collaborating lab in Portugal
Travel	2700	5621	+2921	Travel exceeded the expected budget as it covered 2 field seasons and there were also unexpected vehicle maintenance costs this season.
Volunteers	1500	2659	+1159	This came slightly under budget as we recruited less new volunteers for the latest field season and focussed more on skill development for our long-term field assistant Bernard.
Sub-total	**10000**	**8587**	**-1413**	
Printing	143	207	+207	This took longer to spend than anticipated but came slightly over budget.
Additional surveys		1269	+1269	Change of use
TOTAL	**10000**	**10063**	**+63**	The project work overall came under budget, but the balance was due to be used for the printing of the information booklet which is currently at draft stage. We would like to request to retain the allocate funds to complete the printing despite it being completed after the project timescale.

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

Completing the genetic analysis and data analysis in order to publish paper and complete my PhD are essential. Outreach needs to be expanded to involve more teacher and academics training and collaborations.

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?

All presentations included the logo and funding was acknowledged. University student and wildlife professional audiences were actively encouraged to develop projects and to apply.

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

Project Co-ordinator **- Helen Taylor-Boyd**
PhD supervisors **- Prof. Kirsty Park & Dr Elisa Fuentes-Montemayor, University of Stirling**
Local field assistant **- Bernard Kangwa**
Local student projects **– Chrispine Maambo, Denis Siantumbu, Bhura Zainul-Abedeen**
Logistics and vehicle maintenance support **– Daniel Boyd**
Other local fieldwork and outreach volunteers **– Clare Mateke, Frank Willems, Lameck Nyirenda & Shadreck Phiri**

13. Any other comments?

I can't thank you enough for the support throughout the project and especially for the flexibility with changing the allocation of funding and the time extension for this grant.