

Final Evaluation Report

Your Details	
Full Name	Dickson Anoibi Matthew
Project Title	Roost site suitability survey and conservation campaign for bat roost protection in Plateau state, Nigeria: A focus on straw-coloured fruit bats.
Application ID	38012-1
Date of this Report	28/02/2024

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 assess the population of the Straw-coloured Fruit bats				The population sizes of bats at the two identified roosts were successfully determined using the count method. The roost at Jos Museum holds about 15,000 bats and the Gindiri roost holds over 50,000 bats at the time of our survey. These population sizes, as we learnt, fluctuate very much throughout the year. Public perception indicated a notable decline in bat numbers compared to historical times, because of identified threats such as hunting and habitat destruction. A continuous monthly count will help us monitor the population trend over long period of time.
To assess the characteristics of the roost sites of the Straw-coloured Fruit bats				Hunting, noise and logging were significant threats at the roost sites. Bat populations were influenced by tree age, density and species. Compared to random sites, the roost sites had more diversity of trees, were more forested and had taller and older trees.
To assess the local perception of bats using the Straw-coloured Fruit bats as a case study				At the two study sites we successfully conducted one-on-one interviews with people on the sites and in communities surrounding the sites using questionnaires and focus group discussion. We assessed the knowledge, attitude and perception of people. Awareness and acknowledgement of threats to fruit

			<p>bats were high among respondents. Overall, the findings indicate that people are generally unaware of the bats' ecological importance and perceive them primarily as a food source. Bats were also thought to be associated with diseases and witchcraft.</p>
<p>To carry out conservation awareness campaign in communities surrounding the identified roost sites.</p>			<p>We had sensitisation lectures at both roost sites. People present were students, community members and stakeholders. There was increased awareness and willingness of people to conserve fruit bats after sensitisation efforts. In fact, Jos Museum and Zoo workers were very happy to learn about these bats and how important they are to the functioning of ecosystems. Some have worked there for over 20 years but had never realised how important the bats at their workplace were. Meanwhile, there is need for targeted awareness for hunters at the Gindiri roost because of high level of hunting by a few individuals that see it as a source of income.</p>

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

a). The population size of fruit bats in the study areas was successfully estimated. To the best of our knowledge this is the first ecological survey to determine the population size of bats in northern Nigeria. Now we have an estimate of the bats population, and we know what threats the population is facing.

b). A major output of this project is the enlightenment of people. I can only still imagine the happiness and interest that locals demonstrated when we told them about the benefits of bats. Now they know that bats are not just good a source of meat, but they play important ecological roles in the function of an ecosystem.

c). The perception about bats was that they were associated with evil and disease and seen as nuisance. Through a series of well organised conservation education programmes community members are now willing to participate in the conservation effort. This is a tremendous outcome of community engagement.

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

The insurgency of herdsmen-farmers clashes in communities close to our study location, Gindiri, Mango Local Government area towards the end of 2023 and spilling into early part of 2024 prevented fast execution of the last phase of the project in that area. We consulted with the Rufford team to allow us some time for the crisis to wane. Eventually we were able to finish up our sensitisation campaign in that study site.

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

Community members around roost sites were very enthusiastic and supportive of the project. They served as subjects of the social surveys and participants in the sensitisation programmes. Community and institutional heads were very willing to organise their subjects for us to conduct the sensitisation programme. They were curious about what we would find in studying the bats, as such they gave us all the support we needed. The enlightenment they got was obviously a knowledge breakthrough for them. The materials we provided in form of t-shirts, face caps and jotters were very much appreciated. Those materials will serve to remind them of spreading the idea of conserving the bats in their communities.

5. Are there any plans to continue this work?

I am very much interested in the ecology and conservation of bats, and I hope to build a research career in it. In collaboration with my team, I hope to follow up this study and expand on it. Follow up study may include identification and mapping of more roost sites on the Jos plateau and other places in northern Nigeria, providing alternative livelihood means to reduce hunting pressure on the bats. We understand that the long-term survival of the species will come from protecting the species over large scale across its range. Therefore, identification of more roosts and potential roost sites in northern Nigeria may be important for this species.

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

We have already started sharing the results of our work; we gave a conference presentation on "Evaluating public perception of bats and implications for their

conservation in Nigeria" at the 8th Biodiversity Conference of the Nigerian Tropical Biology Association (NTBA) and the Nigerian Society for Conservation Science (NSCB) held in Lagos in 2023. We will be giving another conference presentation on the "State of fruit bats in Northern Nigeria: assessment of population, threats and engagement of communities for conservation output" at the student conference for conservation science in Cambridge in March 2024. Aside these, we will publish the findings of this project in peer reviewed journal and disseminate report to stake holders. We will also give seminars at our local institution, APLORI.

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

During the project execution we identified some things that we can do in the immediate future as part of the next phase of the project. We are dedicated to conserving the population of bats in northern Nigeria.

Firstly, while we will be developing our manuscript for publication, we shall continue to monitor and carry out evaluation of our conservation campaign to track attitudinal change of people around the roosts, as post-sensitisation campaign evaluation revealed that people were now enlightened and were willing to participate in the conservation efforts.

Secondly, we see a need for a more targeted approach for conserving the bats in the roosts especially, at the Gindiriri site. At this site the level of hunting is high. They hunt the pregnant and the lactating individuals. The hunting is done everyday as long as the bats are there. The set of people carrying out this hunting see hunting as a source of income, selling the bats in bags to some bush meat restaurants. Aside meeting them one-on-one, we intend to collaborate with the authorities in charge of the identified roosts to make banners and signpost with indication that the bats are not to be hunted nor disturbed. This actually was a discussion had between my team and the Jos Museum workers (one of the project sites).

Thirdly, we intend to establish and coordinate a citizen science programme for bats (in northern Nigeria) to identify more roosts and monitor them continuously. We learnt that the bat populations in the identified roosts fluctuate throughout the year. There is need to count the bats population yearly in a long-term monitoring exercise to track population changes over time and to evaluate the effectiveness of our conservation efforts. We shall identify people and train them on how to count bats in roosts for a monthly account of the bats population in the roosts we have identified. We shall upload the data to relevant data bases and interest groups for example, Eidolon Network.

Fourthly, during the sensitisation outreach, people told us about other bat roosts on the Jos Plateau and other states in northern Nigeria. I personally have seen fruit bat

roosts in this region when I travel. However, we do not know what ecological and human impact affect those populations. We shall conduct wide search for unidentified roosts and include all of them in our monitoring activities using citizen science. The same citizen science programme will function to extend sensitisation campaigns to areas around other roosts.

Finally, we shall apply for more funding from Rufford to be able to carry out all that are stated above.

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?

We used Rufford logo on all the printed materials we used - t-shirts, face caps, jotters, posters and banners, and acknowledged the organisation for funding this project during our outreaches and conference presentation. All publications in peer review journal as well as report will acknowledge the Rufford Foundation.

9. Provide a full list of all the members of your team and their role in the project.

Dickson Anoibi Matthew: Team lead, GIS and remote sensing, research design, Data analysis and Report writing.

Alai Lawal: Leader of conservation education and awareness creation, vegetation survey

Jesse Gwom Thomas: Coordinated the ecological survey of fruit bats, measurement of roost site characteristics.

10. Any other comments?

We acknowledge The Rufford Foundation for funding this project, and APLORI for all the support as a co-funder. We believe that this is the beginning of a new era for bats in northern Nigeria and we are determined to chart the course for bat conservation in the region.



Figure 1: Bat clusters.



Figure 2: A flying *E. helvum* with a pup.



Figure 3: Me at one of the bats counting sessions.



Figure 4: Cross section of the sensitization lecture to the staff of Jos Museum and nearby community members.



Figure 5: Jonathan, an assistant, placing the banner in preparation for the sensitization at the roost at Jos Museum.



Figure 13: Caps, T-shirts and jotters we made and shared during the outreach.