

Project Update: May 2023

Brief background information

Straw-coloured fruit bat (*Eidolon helvum*) is the most well-known bat species that utilises urban areas for roosting and has ability to roost in large numbers with a migratory tendency. It is important for pollination and seed dispersal hence, the maintenance of plant populations and distribution (Randhawa *et al.*, 2020). For example, it is known to assist the germination of the threatened *Milicia excelsa* seeds (Magloire *et al.*, 2017). Despite its high ecological relevance, the bat's population is declining across its range (Mildenstein *et al.*, 2016; Costa *et al.*, 2020), probably because it is arguably the most hunted bat species in Africa (Peel *et al.*, 2017) suffering from persecution by roost tree clearance and direct eradication attempts (Webala *et al.*, 2014). Nigeria is one country where it is heavily hunted (Oyewo *et al.*, 2021). Some conservation efforts to protect and monitor fruit bat roosts in Nigeria have been done in the South-Western Region where the belief and culture supports its hunting for protein and medicine (Adeyanju, 2018). In the north, similar to the southern part of Nigeria, obvious hunting of the bat frequently occurs. For example, there is hunting of bats and active habitat degradation around identified roost sites on the Jos plateau in northern Nigeria. Personal communication with locals suggests that the bat population has significantly declined at their roosts over the years. However, there is no scientific information on the roost site characteristics, level of disturbance and people's perception about it in these places. Understanding these factors is important for informing conservation action of the species.

Aim and objectives

Our work seeks to create awareness for the conservation of straw-coloured fruit bats. The specific objectives are:

- 1) To assess the population of the bats.
- 2) To assess their roost site characteristics.
- 3) To assess the local perception of the species.
- 4) To carry out conservation awareness campaigns in communities surrounding the identified roost sites.

The objectives are connected and follow in the order mentioned. The project is broadly divided into three phases, an ecological survey, social survey and awareness campaign. The first phase involves estimation of the straw-coloured fruit bat population and their roost site characteristics. The second phase involves a social survey through questionnaire administration to assess the perception of locals towards bats, and finally, the third phase entails carrying out a conservation education and awareness campaign to foster community engagement in conserving the species. The timeline for achieving the objectives is summarised in table 1.

The updates on the progress of the work are as follows: I and my team have completed the first phase of the work, estimation of *Eidolon helvum* population and assessment of their roost site characteristics, at our two study sites of Jos conserved site/Museum (9.94283N, 8.88358E) and the Mission compound Gindiri (9.58781N, 9.21506E). This update mainly centres on the details of the accomplishment of these objectives.

Methods used

Immense effort was focused on counting the bats at their roosts. As previously proposed, we counted bats cluster by cluster and branch by branch for all the trees where bats were found. We counted the number of buildings within a 500 x 500 m quadrat at the roost site and estimated their age. We identified all tree species that served as bat roosts and determined the percentage leaf cover, DBH and height for each of them. We also estimated the extent of logging by counting tree stumps and snags within three 50 x 50 m quadrats. Other activities carried out were estimation of distance of roosts to nearest water body and farmland. All parameters taken at the roosts were also taken at random sites, which were randomly selected.

Observation during field work

The bats numbered over 10,000 individuals at each of the roost sites (exact population estimates will be provided upon completion of data analysis), but the population in Gindiri appeared greater than that at Jos Museum.

It is important to indicate that several threats to the bats and their habitat were encountered. A major threat to the Gindiri population proved to be hunting while at the Jos Museum, the threat is logging. I had a quite emotional experience when at Gindiri, right during our surveys, a mother bat and her pup were both shot down with a catapult. Thankfully as I approached, the hunter ran away, but the bat was wounded and lay down helplessly. Nevertheless, I managed to hang it back on a tree where it clambered back up the tree. Furthermore, at Gindiri, people hunt bats every day and sell them to some local bushmeat restaurants. Unfortunately, they hunt even pregnant as well as lactating individuals. Other forms of threats the bats are facing in both study sites include anthropogenic noise, urbanisation (increased number of buildings) and bush burning.

Important next steps

The locals need serious sensitisation, and I believe our project came at the right time. According to our activity time scale, the next item is the assessment of local perception of bats through questionnaire surveys (This is the second phase of the work). After this we will know exactly the perception of the people and their reasons for hunting the bats. We shall analyse our data and carry out a conservation education campaign.

Table 1. Updated activity time scale

S/N	Event	Old Date	New Date	Status
1	Consulting with community leaders and relevant stakeholders to commence study	1st week of November, 2022	2 nd Week of February, 2023	Done
2	<i>Eidolon helvum</i> population estimation	November to January, 2022	February to April, 2023	Done
3	Assessment of <i>E. helvum</i> roost site characteristics	November to January, 2022	February to April, 2023	Done
4	Assessment of local perception of bats through questionnaire surveys	February to April, 2023	May to July, 2023	Ongoing

5	Data analysis and Report writing	May to June, 2023	August to September, 2023	
6	Preparation of outreach materials	June, 2023	September, 2023	
7	Conservation education	June to July, 2023	September to October, 2023	
8	Writing and sharing report with stakeholders	August to September, 2023	November to December, 2023	
9	Writing of manuscripts for journal publications	October, 2023	January, 2024	



Figure 1: Mother bat with her pup that was brought down with a catapult at Gindiri.



Figure 2: Bat hunter at Gindiri carrying bats (They hunt every day and sell the bats to some bush meat restaurants.)



Figure 3: A dead pup that was detached from its mother. The mother was hacked down and hit on the ground to detach the pup.



Figure 4: Bat clusters



Figure 5: Bat clusters



Figure 6: A flying *E. helvum* with a pup.



Figure 7: Me at one of the bats counting sessions.