

1. Please 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 identify and map important bat caves				By using public radio announcements, records from literature and exploratory trips to several locations, we successfully identified and mapped 10 caves.
To document species composition and colony size				Nine species were documented for all caves. These include; Jones' leaf-nosed bat, <i>Hipposideros jonesi</i> ; Aba leaf-nosed bat, <i>Hipposideros abae</i> ; common African leaf-nosed bat, <i>Hipposideros ruber</i> ; West African slit-faced bat, <i>Nycteris macrotis</i> ; Hairy slit-faced bat, <i>Nycteris hispida</i> ; Lander's horseshoe bat, <i>Rhinolophus landeri</i> ; Mozambique sheath-tailed bat, <i>Coleura afra</i> ; long-haired rousette, <i>Lissonycteris angolensis</i> and lesser epaulet bat, <i>Micropteropus pusillus</i> . Population size was based on direct roost count in accessible caves. We counted an average of 1100 individuals in a cave.
To build capacity of young scientist in bat research				Nine university students were trained in methods of bat capture, handling, and identification of caves bats, roost and emergence counts as well as conducting interviews with community members.
To promote legal protection of important bats caves				Results of the project is currently being discussed with community leaders to engender the needed support for legal basis. Once, this stage is completed, we will present the results of the project to the wildlife division of Ghana for further action.
To identify local threats and to implement a				At each cave site, we recorded evidence of human activities

<p>conservation program to create awareness</p>			<p>(threats) and conservation education programmes were rolled out in the form of school outreach, one-to-one/house-to-house education campaigns, church outreach and community education.</p> <p>One major immediate threat to cave bat populations is the use of caves for religious activities particularly as prayer sanctuaries by certain churches. This involves lighting of the caves using electrical generators, littering with plastic waste, noise pollution and water pollution. Other identified threats included hunting of bats, deforestation, rituals, farming close to caves, and use of caves as storage for agricultural products and as fire place for cooking by farmers.</p>
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2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

The main difficulty was getting people using the bat caves as prayer sanctuary to talk to them. After months of continuous visits to cave sites, some of them cooperated by allowing us to interview their members and educate them with some form of ground rules such as no taking of pictures and no recording of voices. Also, one major difficulty was that the problem was not localised, thus most pilgrims came from different regions to the cave. Conservation education for this group of people was done on a one-to-one basis upon encounter.

We visited several caves based on information obtained through community members with the expectation to find bats, but our exploratory trips to these caves did not yield any positive results since most of the caves had no bats in them. This however caused an increment in our transportation budget.

Caves identified during the project usually had multiple entry and exist openings and several inaccessible cavities. Thus, population estimates were not feasible for some caves and was therefore limited to accessible ones. We were also unable to build harp traps as suggested by the reviewers due to technical difficulties in the construction and the high associated charges.

Pictures of bat species captured during fieldwork were used in the development of education content for conservation education at both communities, schools and churches, thus giving community members the chance to see bats from their communities. We contributed to the local economy through payment for accommodation, food and announcements at local community information centres.

5. Are there any plans to continue this work?

Yes, there are plans to continue. So far, our project seems to have documented the largest population of the threatened Jones leaf nosed bat after the effort of Priscilla Anti to document this species in 2013. Having established this population, we plan to investigate the genetic diversity, movement and foraging ecology of the species to inform extensive conservation management.

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

Both data on the species diversity in the caves and knowledge and perceptions of people living close to bat caves will be subject to analysis and published in a reputable scientific journal. Research findings will be shared with the Ghana Wildlife Division, Forestry Commission of Ghana, Department of Wildlife and Range Management (KNUST), Department of Animal Biology and Conservation Science (University of Ghana) and other concerned conservation organisations. Lastly, some bat pictures have been shared with AfriBat project on inaturalist.org.

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

The RSG was used over the period of 1 year as specified in the project proposal

8. Budget: Please 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.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Hiring vehicle & fuel	1500	1605	-105	Increased number of exploratory trips and increase in fuel prices
Field equipment (mist net & accessories, foldable table, foldable chairs, field tents, headlamps, Garmin GPS receiver, Digital camera)	1487	1487	0	Supported with other budget lines from BatLife Ghana
Living cost for field work	896	896	0	

Workshop (conference hall charges, lunch, conference package, transportation)	490	490	0	
Conservation education (project banner, t-shirts, printing of questionnaires)	550	500	+50	T-shirts were printed at a reduced cost
Field supplies	350	350	0	
Vaccinations for rabies	140	140	0	
Radio announcements	100	55	+45	Resorted to announcements at local information centres
Total	5513	5523		

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

Protection of roost, preservation and correct management of foraging habitats and understanding human attitudes are vital elements of bat conservation. Thus, looking ahead, the important steps will be to:

- Conduct detailed ecological studies on foraging behaviour and habitat selection of the near threatened West African endemic, Jones's leaf-nosed bat (*Hipposideros jonesi*) to inform action plans and conservation management.
- More extensive exploratory trips to discover more bats caves and their species diversity.
- Continuous conservation education campaigns for church groups using bat caves for church activities to eradicate habitat disturbance and encourage more positive support for bat conservation.
- To build stronger collaborations with communities through participatory community resource management of caves and its associated ecosystems.
- One laudable suggestion from one of the communities was to secure the cave by fencing the entrance of the cave to control the rate at people enter to go and pray.

10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

Yes, the Rufford Foundation logo was printed on all t-shirts, posters and all power point presentations used during the project. Also, the Rufford Foundation will be duly acknowledged in all resulting publications and conference presentations.

11. Any other comments?

We are grateful to the Rufford Foundation for the financial contribution to the bat conservation efforts in Ghana and we look forward to their continuous support for biodiversity conservation.



Hipposideros jonesi

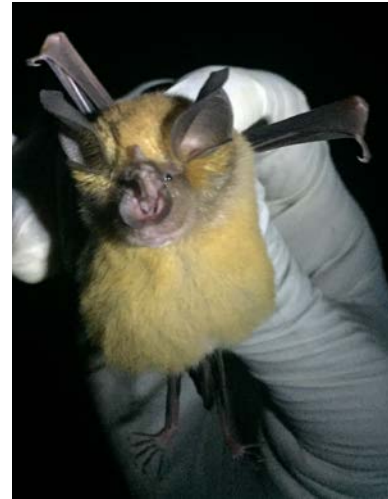
Hipposideros abae

Hipposideros ruber



Nycteris macrotis & *N. hispida*

Coleura afra



Rhinolophus landeri



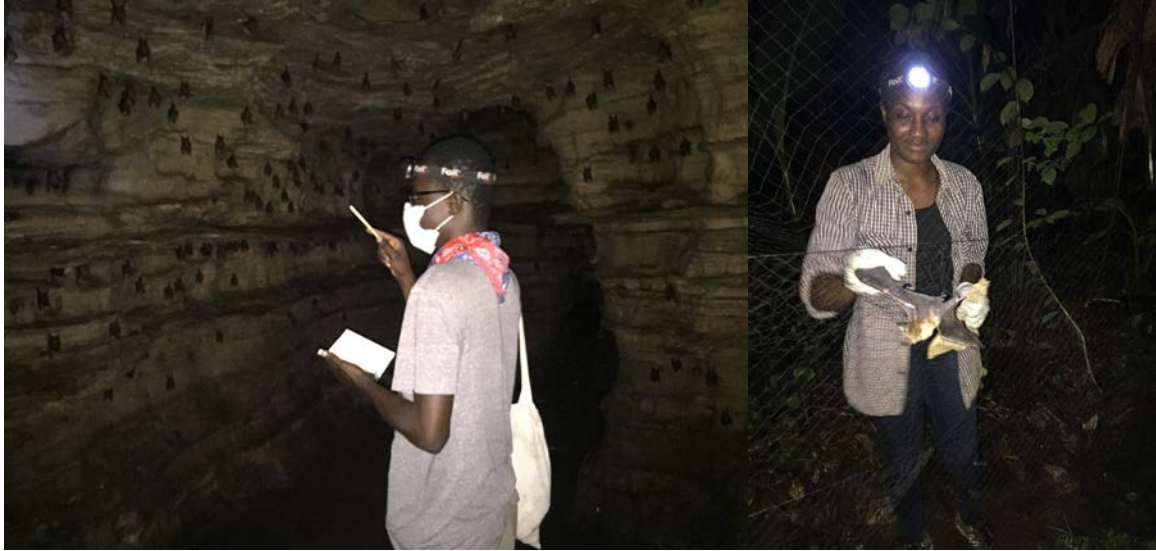
Lissonycteris angolensis



Micropteropus pusillus



Student training



Left: Roost counts at a cave in Kwamang. Right: Team member about to remove bat from the net



Left & Middle: School educational outreach. Right: Interviewing of local residents



Left: A candle lit in a bat cave for prayers. Right: Litter left behind by a church group in a cave