The Rufford Foundation
Final Report

Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other format. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Iroro Tanshi
Project title	Forest interior insectivorous bats on elevational gradients: response to forest structure, species richness pattern and conservation of the Vulnerable *H. curtus.*
RSG reference	19078-2
Reporting period	2017-2018
Amount of grant	4590
Your email address	Iroro.tanshi@uniben.edu
Date of this report	31 January 2018

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
Identify texture sensitive predictors of bat habitat				I collected all the vegetation data, but have yet to complete the data analysis, because I am still extracting data from images of vegetation.
Identify species richness pattern on mountains in SE Nigeria				Bat species richness declined monotonically with elevation, supporting McCain's 2007 model of global bat species richness patterns.
Identify additional localities for the vulnerable *Hipposideros curtus*				I discovered the first protected area roost in Cross River National Park, which was also the first record for the park.
Launch first conservation project for *H. curtus* through: ranger training on wildfire documentation, engaging community leaders on fire ban laws and local people workshops				Rangers were trained and provided with notebooks for recording wildfire incidence; date, cause, extent, etc. Community leaders and local people reach a consensus on how to responsibly burn farmland to prevent wildfire outbreaks. A Knowledge-Perception-Attitude pre and post workshop evaluation questionnaire, demonstrated that some aspects of the workshop were effective at improving knowledge but not others. The discussion also revealed that the complexity of making bans and enforcing them particularly in the face of unpredictable weather such that start and end dates for rainy/dry seasons have become so variable, it's difficult implement ban periods.

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

a. Our 4 x 4 field truck broke down and the repairs took 2 weeks. But upon commencing the journey, it broke down again and we had to rely on public transportation and day-only hiring of mini-vans.

b. Difficulty meeting with cattle herders who manage pastureland at CRNP boundary. Grazing areas are maintained by fire which occasionally spread into the park, responsible for >90% of wildfires in the Okwangwo division of CRNP. An ailment prevented me from attending a scheduled meeting, which couldn't be rearranged before I left the field. As a key stakeholder in the responsible use of fire around the park, future efforts will focus on engaging this group.

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

a. Discovery of a new country record *H. curtus* and species list for both Afi Mountain Wildlife Sanctuary (AMWS) and Cross River National Park (CRNP).

b. Discovery of the first protected area roost of the *H. curtus* at CRNP and first record for the park. The roost was a small boulder cave-like roost, containing between 15-20 adults, of which one lactating female was spotted and a juvenile on the roost wall. The small roost size supports reports from Cameroon and Bioko Island (Mickleburgh et al., 2008). The records from AMWS and CRNP, confirms an established population for this poorly known species, forming the basis for additional work on its ecology to design an effective conservation strategy.

c. Launch of the first conservation project for *H. curtus* by confirming established populations in protected areas, engaging Buanchor community leaders on local fire ban laws towards enforcement of bans, engaging local people on responsible farm burning and training Rangers to record wildfire outbreaks.

4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

This project engaged local people during two workshops conducted in the town halls of Buanchor and Anape communities in AMWS and CRNP respectively. The workshops provided a forum for local people to discuss about the negative impacts of wildfires (from uncontrolled bush burning) on local livelihoods, biodiversity habitat and stability of rocks (burned areas on mountains are susceptible to rock falls and landslides). Several issues about difficulties with enforcing and adhering to fire bans, suggestions on responsible bush burning techniques. During the meeting at Buanchor, we reached a consensus that given the negative impact wildfires, it's important to remind the population annually, while evaluating how the community has improved on responsible bush burning and enforcement of laws. Buanchor community is currently considering a proposal to integrate this annual bush burning appraisal into their yearly cassava festival. If this model is successful at raising the attitudes to bush burning and thus reduction in wildfires in the future, it will be a viable model for other communities around the wildlife sanctuary. Furthermore, conservation education workshops targeting school age children were conducted in both communities. Information fliers, posters and t-shirts with conservation messaging were also distributed during the workshops. Furthermore, I employed the services of local people as assistants and porters, thereby contributing to the local economy.

5. Are there any plans to continue this work?

I plan to continue working in this geographical area over the course of my career in field ecology, aiming to further understand montane biodiversity, unravel how forest structure at micro-habitat and landscape levels drive bat species composition and richness and investigate *H. curtus* ecology to prepare an effective conservation action plan and intervention program for the species.

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

I plan to communicate my results to the scientific community by publishing peer reviewed publications in relevant journals and at academic meetings. I have already presented the preliminary results of this project at the North American Society for Bat Research (NASBR), 2017 meeting (poster presentation) and the Texas Tech University association of Biologists (TTUAB), 2018 meeting (oral presentation). Additional conference presentation will be delivered as the data analysis progresses. I will also share a report with the management of both protected areas and publish a local newspaper/magazine report of my results.

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 grant was used over a 1-year period, which is the same as the anticipated period of the grant award.

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
International flights	1930	1667	263	I found cheaper flights.
Local flights and transportation	120	719	-599	Our 4 x 4 field truck broke down so we had to rely on hiring vehicles or public transportation
Conservation t-shits	2540	948	1592	I received matching funding to print t-shirts.
Food	0	870	-860	Although unbudgeted, we spent three additional weeks in the field due to delays with equipment breakdown. Funds were then used to cover food for the team.
Transportation of gear (van and motorbikes)	0	410	-410	Due to field truck breakdown, gear had to be transported using a

				combination of vans and motorbikes (for areas where only 4 x 4 trucks could reach).

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

a. Assess the conservation status of *H. curtus* by investigating population structure, habitat associations and to what extent populations are impacted by wildfire. The information from this will be used to build a contemporary action plan for the species.

b. Use appropriate sociological research instruments to uncover the dynamics of wildfire outbreak (from bush burning) in communities surrounding both protected areas, both of which hold Nigeria's last remaining primary forest. This will help identify key intervention and approaches for the conservation of *H. curtus* and other endemic biodiversity in the area.

c. Conduct a thorough investigation of the bat biodiversity, as there appear to be cryptic diversity among at least two families (Rhinolophidae and Hipposideridae) and one genus (Glauconycteris) of bats in the area.

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?

The Rufford Foundation logo was used on t-shirts, fliers and posters distributed during workshops. During the workshop and at scientific meetings, I always made it clear that the project was funded by the RF.

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

Team leader
Iroro Tanshi led the team to both mountains, trained volunteers and local assistants on harp trapping, bat handling and vegetation assessment, as well as ensuring that all protocols were followed.

Volunteers:
Chidiogo Okoye helped with measuring routine biometrics and wing morphology on bats, recording vegetation characteristics measurements and maintained accounts.
Adeyemi Adetimehin helped with measuring routine biometrics on bats, wing morphology, measurement of vegetation characteristics and moving traps between transects.
Godwin Chinemerem helped with measuring routine biometrics on bats, measurement of vegetation characteristics, maintaining equipment in good condition.

Rangers/local assistants
Chris Oned recorded bat measurements, harp trap set-up and movement between transects.
Joseph Agbor measured wing morphology and vegetation characteristics.
Jerome Anya recorded bat measurements, harp trap set-up and movement between transects.

Local Assistants: Seven other local assistants supported in similar ways mentioned above.

Porters: Over 40 porters helped with moving gear between camps.

12. Any other comments?

This funding provided a wonderful hands-on opportunity to explore mountain bat biodiversity, learn that conservation interventions go beyond conservation education and awareness, requiring sociological instruments that can uncover areas to focus on. Finally, the KPA analysis suggested by the reviewers during my application was an eye opener, because it helped me to assess the effectiveness of some communication techniques.

Left: *H. curtus* female with pup. Right: *H. cyclops*.

Left: *Nycteris intermedius*. Right: Mountains - view at CRNP.


Left: Moving harp traps between transects. Right: Kids conservation education activity session.


Left: Workshop on bats, fire, mountain and forest. Right: Chief rangers at both PAs preparing fire reporting note book.


Left: Fire training workshop participants. Right: Field crew including volunteers, rangers and porters.