The Rufford Small Grants Foundation

Final Report

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

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. 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. 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	D Pilot Dovih
Project title	An assessment of hunting pressures and conservation status of bats in and around Mt. Saramati, and the impacts of bats on public health
RSG reference	14228-1
Reporting period	12 months
Amount of grant	£ 6000
Your email address	pilotdovih@gmail.com
Date of this report	2 March 2015

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
Biodiversity assessment: Identifying species more prone to hunting and other possible resident species			Fully achieved	We also surveyed three villages and five towns along the way to the main field site (Mimi), from October to January 2013, May to June 2014, and October to November 2014. A total of 15 species were identified during this survey. We used mist nets near forest site, trails and gardens. Cave roosts were also surveyed in some areas. In total, we identified 15 species of bats from eight locations.
To investigate demographic processes in hunted populations using genetic data an interview survey		Partially achieved		Preliminary work on potential population bottleneck on the harvested bats has been done using mitochondrial gene (D-loop). Need further study to confirm.
Awareness programmes about the significance of bats/wildlife			Fully achieved	We conducted outreach program with the Bomrr and other clan members. We addressed the ecological importance, and potential impact to their health. We conducted a drawing competition for school children aged 5-12 yrs. The kids enjoyed sketching bats and other depictions from the posters, along with some general wildlife subjects. We conducted games to explain ecosystem functioning, specifically how all species are inter-dependent. The game also explained the impact on various species if the chain breaks. We screened conservation-oriented documentaries like "Flying Free" on the Amur Falcon, Nipah virus outbreak in Malaysia and and "The Bat Harvest" which we have click during the harvest for villagers and Bomrr clan members. Most of them were ignorant of the possibility of disease transmission from wildlife to

				humans. The clan members have expressed their desire to discuss further among themselves for sustainable harvesting or completely ban the practice. They have not given us the exact time frame when they would stop this annual rituals.
Pathogen load in bats(screening of rabies) and possible impacts on hunters			Fully achieved	We have collected 110 brain samples from the harvested bats and about 50 serum samples. We found positive for rabies virus in some samples. Waiting for serum result to confirm the test.

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

There was an internal dispute within the bat harvesting clan members (Bomrr clan) in the village over ownership rights on the caves. This hampered our work for a while as we had to rethink and rescheduled the entire plan. However with the timely intervention of the district administrators the dispute was solved amiably amount themselves.

The other challenge was the availability of taxi. Due to the remoteness of the region and extreme off road most of the taxi refused to go. Even if they accept to take us they charge extremely high charge for maintenance/repair.

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

1. Our most important outcome will be finding the evidence for rabies virus from the harvested bats. This will give us a strong support to convey the message to the locals what they doing is harmful to their health.
2. The villagers were ignorant about the importance of bats however through this project many came to realise how important bats are. Besides that our project has also helped them understand how diseases could jump to humans from wild animals if we are in close interactions with them (especially handling and hunting).
3. Third outcome will be finding one bats species that is new to India. Also finding the mostly commonly harvested bats species such as *Rousettus leschenaultii* and *Eonycteris spelaea* are known to have antibodies for Ebola virus in Bangladesh and henipavirus- related paramyxovirus in China.

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

We hire the bat harvesting clan members for our study. We also took them to other neighbouring villages and taught them the importance of bats and their ecology.

5. Are there any plans to continue this work?

I will be continuing this work to encourage the clan members to gradually stop this harvest. To achieve this I will be working closely with the concerned District Commissioner and Wildlife Warden. I am taking this project further for my PhD to investigate impact on the demography in hunted populations using genetic data. In addition screen for viral load in the hunted bats that may have potential impact on humans. Recently I have collaborated with Duke-NUS Singapore for disease work. I will continue to working with this community for few more years. I am also planning to start introductory workshop for college students on bats ecology, importance, handling, diseases and conservation in Northeast India.

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

I will be sharing the finding with the local communities, this coming field season. I will be publishing in a popular magazine about the harvest story. Apart from that I am working on manuscripts on rabies in bats and monograph on bats in Nagaland. I will be also presenting my study in Student Conference for Conservation Science, Bangalore. This report has been submitted to Nagaland Forest Department in 2014.

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

RSG was used from March 2014 till date. It compares well the actual length of the project.

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.

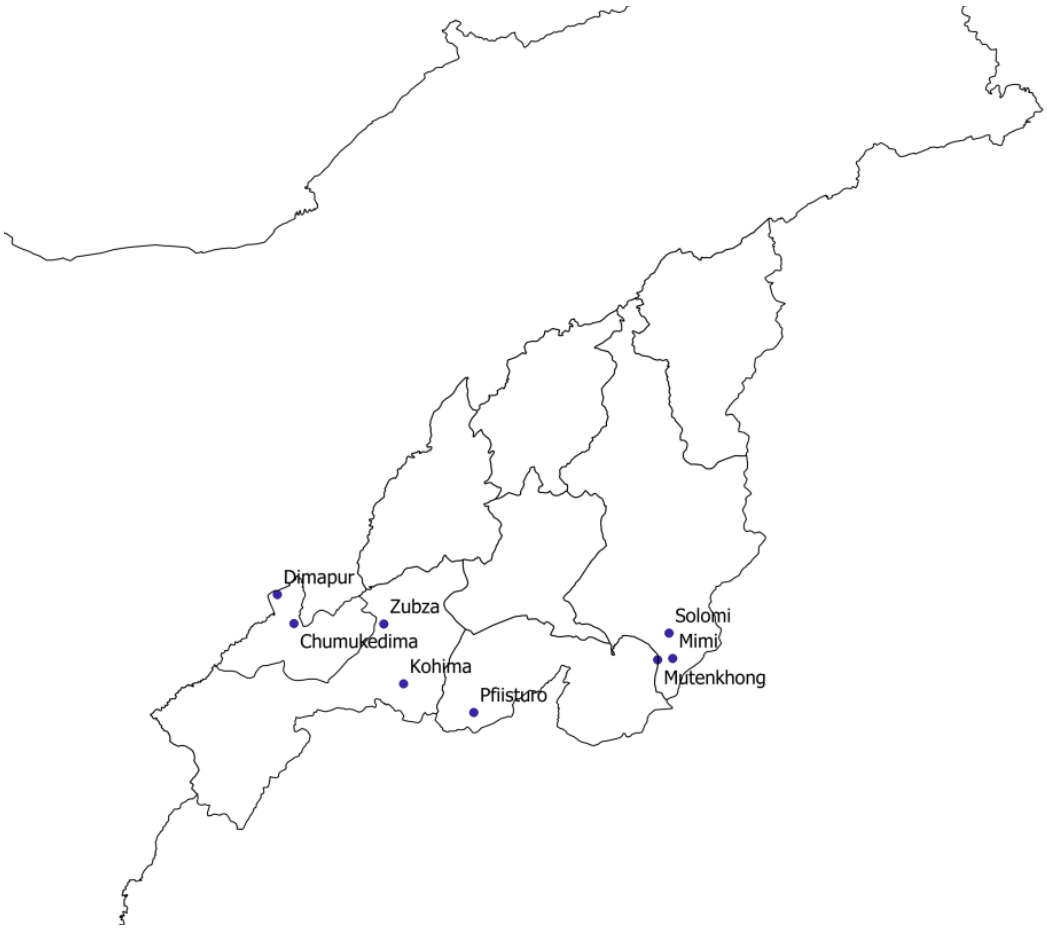
Item	Budgeted Amount	Actual Amount	Difference	Comments
Team expenses on food & accommodation	2400	1835	+565	
Field Assistant	600	582	+118	
Outreach programs	800	715	+85	
Transport	1000	1297	-297	This includes my flight tickets to attend Rufford meet in Yangoon 2014. Transportation cost was higher than expected due to remoteness of the field site and extremely bad road.
Consumables for sample collection	250	280	-30	
Field gears	600	620	+20	
Others Miscellaneous expenses	350	320	-30	
TOTAL	6000	**5449**	+351	I will be using this balance for a workshop on bats in Northeast coming this year field season

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

With increasing human population and degradation of forest, the frequency of infectious disease will increase in near future. Recent disease outbreaks including Ebola, Nipah, severe acute respiratory syndrome (SARS) coronavirus and highly pathogenic avian influenza (HPAI) virus, swine flu (H1N1) have a significant impact on human health. I feel we should give some priority towards measures that prevent disease transmission while ensuring the health of the people, livestock and wildlife and the ecosystem. To ensure this we need more educational outreach/awareness to make sure the attitude and behaviour of the people changes. It is known that human behaviour encourages most of the emerging infectious disease outbreaks. For example AIDS known to have originated from non human primates to humans through bush meat hunters. Nipah virus outbreak in Malaysia was known to be linked with the degradation of forest where bats roost.

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

I have used Rufford logo in the posters and oral presentation for the awareness programs. I will be acknowledging for funding in the manuscripts that I am working on to publish soon.



Map of Nagaland: Apart from bat harvesting site these are the locations where I have been to trapping bats to survey bats species in the region. Dimapur, Chumukedima, Zubza, Kohima, Pfotsero, Salomi, Mimi and Mutenkhong.

Most of the harvest bats are fruit bats and few insect bats.

An assessment of hunting pressures and conservation status of bats in and around Mt. Saramati, and the impacts of bats on public health

Application ID: 14228-1

View of the field site (Mimi village)

Bats harvesting clan (Bomrr) leaders

Bomrr clan members from different villages gather together for festival before the bat harvest

One of the fire stakes inside the cave to kill bats. They usually made about two to three fire stakes.

On the first day of the harvest, those black ones were killed bats near the cave mouth. Harvest last for about 3 days. The caves is about an hour walk below the village

Boiled bat meal

Roasting bats to preserve till the next harvest season (next October). They believe bats have medicinal properties.

We conducted a drawing competition for school children aged between 5-12 yrs. Children enjoying sketching bats and other depictions from the posters, along with some general wildlife subjects.

Some of the drawings

We played games to explain ecosystem functioning, specifically how all species are inter-dependent. The game also explained the impact on various species if the chain breaks.

Children trying to understand the Poster depicting the role of bats in ecosystem

Photo session with the village children after the drawing competition

We discussed the importance of bat conservation with the Head Master of the Mimi primary school and teachers. The school management have promised to include nature education sessions into their curriculum at least once a week. We provided them with some education materials like, books, charts, posters etc.

We screened documentaries on conservation, wildlife disease, and bats. Apart from this we also conducted separate outreach program with the Bomrr clan members and village council members addressing the ecological importance of bats, potential impact to their health, and

chances of local extinction if this tradition persist. We let the village decide and come up with a solution how they can gradually stop this harvest.

Identifying bats we caught using mist net