

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	Karma Gyeltshen
Project title	Population Status and Diets of Sympatric Hornbills in Jomotsangkha Wildlife Sanctuary (JWS), Bhutan
RSG reference	25721-1
Reporting period	12 months
Amount of grant	£4,930
Your email address	karmagyeltshen22@gmail.com
Date of this report	22/08/2019

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
Population status of hornbills in JWS				Total of 15 permanent trails, ranging distance of 2 – 27 km were walked in the area traversed at different altitudinal range. The four species of hornbills observed along the trails were recorded. The population status of different species were calculated based on Encounter Rate (ER) along the trails. Thus from the study, it was found that the area have more population of great hornbill (GH) with ER 0.8, followed by oriental pied hornbill (OPH). The population status of wreathed hornbill (WH) and rufous-necked hornbill (RNH) were low with equal ER of 0.1. The population status were also examined along different trails. The hornbills were encountered maximum along trail two (trail ID: T2) nearby Jampani village.
Diets of hornbills in JWS				The study on diets of the hornbills in JWS was carried by opportunistic observation on foraging, midden counts below nests and roosts, observing defecated matters and fruits delivery by male to the nests. The study found the hornbills in the region feeds on 46 food species in total (42 plant species and four animal matters). The plant food species consumed were from 16 families. However maximum were consumed from Moraceae and Meliaceae family. Animal matters observed consumed were two coleoptera beetle species, one crab species and chicks of bulbul bird. However as set in the objectives, this study couldn't collect comprehensive data on diet partitioning among different species. Thus it couldn't provide clear idea on diet preferences of each species. It is because of the difficulties in monitoring diets in large span of area with limited observation, thus it is not over-assumed. The study also couldn't differentiate/categorise diets clearly into different season as majority of diets were found available irrespective of season with

			differing in location.
To study nesting sites of hornbills in JWS			<p>Total of 13 hornbill nests were located in JWS and in the adjoining forest. The nests were found both on live and death trees. Five different tree species were used for nesting with <i>Tetrameles nudiflora</i> being highly used (69.23% of nests on it). The mean height and DBH of nesting trees were 40.31m 82.07cm respectively. The nests were found both in open and dense forest at different altitudinal range. However the maximum nests (n=7) were found between 250 -500 m asl. The mean distance of nesting site from human habitation, road and river were 453 m, 148 m and 226 m respectively.</p> <p>Majority of nest cavities were located on middle third canopy at the mean nesting height of 23.69 m and cavity doesn't emerge above the height of surrounding forest strata (canopy top). Nest cavities were generally circular and elongated in shape measuring mean width and length 14.9 cm and 20.23 cm respectively. Nests were oriented mostly towards north-east and north-west with mean orientation degree of 161.08°.</p>
To study roosting sites of hornbills in JWS			<p>Total of nine roosting sites were found within JWS, however no roost site of RNH could be located. The hornbill roosting sites were found on five different tree species. Similar to nesting, maximum roosting sites were on <i>Tetrameles nudiflora</i> (55.56% of roosts). The mean height and DBH of roosting trees were 38.11m and 79.44 cm respectively, which is smaller than the trees used for nesting. Roosting sites were located in dense primary forest, open forest and in plantation forest (<i>Tectona grandis</i>). The roosting site were found at the altitude range from 302 -539 m and in the slope ranging between 12° -54°. The communal roosting of GH and WH were observed at Akhuri. The flock size observed at the roosts, range from a pair (n=2) to 42 individuals during the study. The total count at the roost were 156 individuals from nine roosting sites.</p>
To create awareness among local people about			<p>The outreach programme to local people on hornbill conservation was conducted to different level of people living within JWS. A presentation was also given to group of</p>

hornbills conservation				<p>conservation enthusiasts in Forest Research Institute, India (after my field work upon reaching university). During the stay in field, I have been opportunistic to talk about hornbill conservation to local people whenever there was gathering (even gathering was for different purpose). In addition to that, during my visit to field, many times I took local companion and I talked about importance of its conservation and issues. Also whoever (local people) I met on the way during field visit, I asked them the information about hornbills, since that is how I can start conversation and gradually I tried to educate and convince them about its conservation individually (whomever I talked to). Many people were very interested to hear and they told me they were 'happy to know some people in the world cares hornbill also' (which would mean they heard about hornbill conservation for the first time). They agreed they will work to conserve and not disturb hornbills and some of them still calls our team and informs us about hornbills in the area, which I feels people are now aware about hornbill conservation.</p>
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2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

The study area was in thick broadleaved forest (sub-tropical) where the settlement were present only in pocketed area in the south peripheral region. Team had difficulty in accessing and lodging in north and northwest regions due to lack of road connectivity and settlements. The camping in the area were also difficult especially during monsoon seasons. However we relied on camping and depended on local transportation facilities and local people to access to difficult areas.

The risk of wild animal encounter and attack was another difficulty the team has to deal with. The team were constantly reminded by village people and forestry officials to be cautious about wild guar and wild elephant. There are past incidences of wild animal attack in the area, where two people were killed by gaur and a few by wild elephant. Whenever we plan to visit difficult and new area, we asked prior information from forestry officials and local people nearby.

Another difficulty the team faced related to this project was in observing dietary pattern and in trying to analyse diet partition among sympatric species. The field observations were not as we planned. The observation on foraging of some species such as RNH were very rare. And in some cases we had difficulty in fruit

identification. Thus we couldn't map the different category of diets for specific species. However we have recorded all the diet fruits observed foraging by hornbills, identified by consulting others/expertise and reported as hornbill diets by listing in common.

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

Since this was a pilot study of its kind in the area, we had many important findings from it. However among many, the three most important outcomes were;

1) Population status of sympatric hornbills in the area

By carrying trail walk proportionately covering whole area, the population status of the sympatric species of hornbills were recorded based on encounter rate (ER). The study found GH has highest population status, followed by OPH. The population status of WH and RNH in the area were least. Now this finding will tell patterns of hornbill population status in the area.

2) Nesting sites and its characteristics

The study founds 13 nests out of which 12 were active. All the nesting sites were characterised. This study found out the site preference for nesting by hornbills. It also found the important tree species that hornbills used for nesting. This findings will help in understanding breeding ecology of hornbills which would contribute in hornbill conservation.

3) Conservation sensitisation to local people

The public sensitisation programme focusing on hornbill conservation were carried and they told us it was their first time hearing a talk on hornbill conservation due to its ecological importance. Through random talks, some local people told they already felled few nesting trees of hornbill and they didn't concern anything about hornbills. However after sensitisation, they told us they will not disturb hornbills and their habitat henceforth and they agreed to conserve hornbills by further spreading information.

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

The local people living in the vicinity are the integral part of forest ecosystem in the region. The local people were involved at different phase of this projects. Since the project is conservation centric, the direct benefits were measurably less. However the project could have benefited the local people from the charges paid during their involvement.

- Local guides were involved during field works. The wages/charges were paid to local guide on daily basis whenever they were involved. This payment have helped people in socio-economic earning.
- Often the vehicle and local transportation facilities were hired from local people during field work. The hiring charge were paid to the people which have contributed in their economic earning.

- During rainy seasons, due to difficulty in camping we rented lodge wherever there were settlement. The rent paid for using their lodge has helped local people in economic earning.

5. Are there any plans to continue this work?

I have chosen my career towards bird and I have developed an extreme interest on hornbills. By carrying this project, I got an opportunity to explore my field of interest. I feels like I have gained many field experiences to study hornbills though this was my first project. This was just my starting. I have plans to continue this project and to carry many similar projects in other part of country too in the future so that gradually I can contribute in conservation of hornbills in Bhutan. I am grateful to Rufford Foundation for supporting this project for hornbill conservation. I look forward for similar supports in future also.

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

I have a plan to share the findings to others as much as possible so that the information will call conservation concerns from relevant agents. Within Bhutan, the findings are shared with Jomotsangkha Wildlife Sanctuary (JWS) and further it will be shared with Department of Forest and Park Services (DoFPS), Ugyen Wangchuck Institute for Conservation and Environmental Research (UWICER), Bhutan Trust Fund for Environment Conservation (BTFCE) and NGOs by submitting summary of project which will be posted in their web page. At international level, I have plan to publish the findings in one of the journals such as Threatened Taxa or any other renown journal to make available to all conservation stakeholders.

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

Actually this project work was started since February, 2018. However the preparatory works, getting research permission and carrying consultation with JWS took a few months. The actual field data collection started in April 2018. The grant from Rufford Foundation for this project was used from July 2018 to April 2019. Soon after I received grant from Rufford Foundation, the grant was used throughout the project period as planned. The project was planned for 12 months, of which more than two months at the beginning was invested for preliminary survey works and in carrying start up minor field works.

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.

The total grant for this project received from Rufford Foundation was £ 4,930. The exchange rate of £ sterling to Ngultrum (Nu.), Bhutanese currency was Nu. 85.55. Tabulated below shows the breakdown of budgeted versus actual expenditure of the grant that I have received from Rufford Foundation.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Food and refreshment	1800	1560	-240	The expenditure for food and refreshment incurred less than budgeted amount which is because of fluctuation and inflation of market rate for products.
Travelling charge and fuel	1300	980	-320	Travelling charge and fuel expenditure was less than budgeted because as far as possible we tried to reduce expenditure on transportation.
Logistics	280	590	+310	The expenses on logistic was higher than budgeted because due to difficulty in logistic and camping in the area, we have to get logistic rented often.
Payment for local team	1240	1470	+230	The payment for team incurred higher than budgeted and it was adjusted from food and refreshment budget. It is because we have to depute multi local guide at different localities.
Communication	180	250	+70	The expenses on communication also incurred higher than budgeted and it was adjusted from other budget. It was due to use of telecommunication and other network facilities for the project purpose.
Data sheet printing	80	80		The printing budget was used exactly as it was planned.
Miscellaneous	50		-50	The budget saved to use for other miscellaneous purpose was adjusted for other above mentioned activities wherever it is required.
TOTAL	4850	4930	+80	

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

This project has really opened my interest. Now I have realised there are so many things that need to do here after. Firstly, the sightings of threatened species RNH were fewer. We need to study the population and distribution of this species in detail. Secondly, the GH and WH were often found together. Therefore their

relationship in terms of diet partitioning, habitat preferences, nesting and roosting characteristics need to study in detail. Also it was observed the OPH prefers little different types of habitat than others, however sometimes they were also found foraging at same site where other hornbill species forage. Thus need to clearly study this. The understanding on breeding ecology of all the hornbill species in detail is another question in line. Since this study was just beginning, there are so many that needs to study and I am hoping to study everything in details gradually.

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

I have produced a report of this project and it is shared with Jomotsangkha Wildlife Sanctuary (JWS). The presentation was done in Forest Research Institute (FRI), India to the professors and conservation enthusiasts. In all, I have used the Rufford Foundation logo. Further in all the report that I will be sharing henceforth, I will be using Rufford Foundation logo. So far, Rufford Foundation has received a good publicity during the course of this project work. Now many seems to know about Rufford Foundation. From here too, in any materials produced because of this project work, I will use Rufford Foundation logo and it is a gratitude for supports given for this project by the Rufford Foundation.

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

Supervisor	Dr. Suresh Kumar (WII, India)	Dr. Suresh, specializing in bird research is the overall supervisor of the project. He guided in planning project activities, data collection methodology, analysis and synthesising outputs of the project.
	Mr. Ugyen Tshering (CFO, JWS)	The area being under his jurisdiction, he has been guiding this project and provided every technical supports whenever needed. The logistic supports where also seek from him. He helped in carry field works.
Permanent field work team along with me	Karma Sherub	Having experience in hornbill research, he has been helping in planning daily data collection and related works.
	Tashi	He is the Sr. Forester with field experiences related to hornbills. He has been leading team in the field with his experience and knowledge on hornbills of the area.
	Karchung	He is a local guide by whom our team was connected with local people. He played important role in the project team in many expects.
Temporary field work team	Tenzin Wangchuk	He helped team in connecting with different localities. Also we had many outputs for the

(local guide)		project due to his experience in dealing with wild.
	Ap. Kezang	He also helped team in connecting with various local people. He helped team in search of hornbill nests by asking around to localities.

12. Any other comments?

This project was completed successfully because of the energetic team I had and mainly due to financial support from Rufford Foundation. This project has also given me an experience with which now I feels there are many things that needs to be done for the hornbill conservation in Bhutan. As mentioned under point (9), there are serious of conservation research that needs to carry here after. Therefore, I hope Rufford Foundation will support for similar project in future also. Thank you Rufford Foundation for supporting this project.