

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	Damber Kumar Ghemiray
Project title	Habitat assessment at the upcoming captive breeding site of White-Bellied Heron (<i>Ardea Insignis</i>) at Burichu, Central Bhutan- underpinning conservation efforts
RSG reference	20540-1
Reporting period	September 2016 - September 2017
Amount of grant	£4998
Your email address	damberrdc@gmail.com/dkghemiray@uwice.gov.bt
Date of this report	15 September, 2017

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 assess the species composition, structure and diversity of forests at captive breeding site of WBH in Burichu, Punatshangchu basin.				<ul style="list-style-type: none"> - Surveyed forest communities of Burichu along the altitudinal gradients from river bed at 370 m to hill top at 770 m asl on two aspects NE and SW respectively. With 17 sampling plots at an interval of about 50 m between plots and the plot size of 400 m². - In each of these plots survey was conducted by vegetation strata; trees, shrubs and herbs. For tree strata quadrat sampling of 20 x 20 m was adopted while for seedling and ground layer, three sub-plots of 2 x 2 m were established diagonally within the tree layer. - 22 families and 39 genera were recorded in SW aspect and 25 families and 45 genera were recorded in NE aspect. These included nine evergreen broad-leaved, 26 deciduous broad-leaved, 17 shrubs, two woody climbers, one coniferous and one palm species. Eleven species in eight families were limited to SW aspect, 15 species in 14 families were limited to north east aspects, and 30 species belonging to 19 families were common to both the sites. - The deciduous trees were found to be slightly more on the SW aspects (seven) as compared to NE aspect (five), whereas conifer trees were more in NE aspect occupying the upper ends (above 620 m asl) of the series towards the ridge top. The forest is mainly dominated by deciduous trees (65%) in lower and mid region of the study area while upper and ridge top is dominated by <i>Pinus roxburghii</i>.

			<p>Although there was difference in floristic composition with respect to altitude, there were no or little differences in structural attributes. Stem density, seedling density and ground biomass were found to be significantly higher in NE aspect.</p> <ul style="list-style-type: none"> - Tree structural features such as maximum height, total basal area, maximum DBH and number of dominant species did not differ significantly between two aspects and this could be due to similar topography and very small width (narrow valley) between two aspects. - However, from the secondary data collected, presence of all the WBH nests in the NE facing slope indicates specificity in habitat preference level of the bird. So key focus should be in conserving NE aspect of this forest as it carries greater conservation values over the SW aspect. - For vegetation survey in the nesting and roosting habitats, 11.3 m radius circular plot was established with the nesting tree as the centre; 5 m radius for shrubs and 1m radius for herbs and ground flora. - Nests were always found on tall Chirpine trees (<i>Pinus roxburghii</i>). - Shanon-Wiener diversity index (H') ranges from 1.03 to 1.31 for trees, 0.14 to 1.75 for shrubs and 0.83 to 1.66 for ground vegetation in different sites. - Jaccard's similarity index calculated for species was 0.44 and for the family 0.52.
To assess the soil and climatic conditions at captive breeding site of WBH in Burichu, Punatshangchu basin.			<ul style="list-style-type: none"> - The soil conditions were studied by collecting soil samples from the study sites. The samples were referred for analysis at Soil and Plant Analytical Laboratory (SPAL), Semtokha for soil moisture content, soil PH, N, P, K and soil carbon determination. The highest moisture content in NE aspect was 3.6%, where as it was 2.3% in SW aspect at 370 m asl. The NE facing

			<p>slope was found to be more moist than SW. Stem density and species richness was found to be significantly higher in NE aspect and this could be due to moisture effect</p> <ul style="list-style-type: none"> - Air temperature and humidity conditions were recorded at the study site using Hobo data loggers. The average annual temperature ranges from 12.8°C to 21.3°C with annual precipitation of 783.5 mm (Source: RNR-RDC, Yusipang).
To understand the perceptions of local communities towards WBH and its conservation threats			<p>-Random survey was conducted to interview the local communities. 87% of the respondents are aware of WBH existence in their locality and their status, whereas 13% are not. People are of the view that, conservation efforts put in by RSPN in advocating the general public has helped in mitigation of disturbing activities within the habitats of WBH to some extent. Nevertheless, from the social survey 30% respondents attributed the disturbances to illegal fishing and hydro-power project, 17% to predator, 11% to logging activities, while 13% of respondents do not have any knowledge on this.</p>
To create awareness to the local communities inhabiting in and around the study sites			<ul style="list-style-type: none"> - Awareness programmes were held targeting mainly local communities of WBH, local heads and relevant stakeholders. I have presented and convinced them on the importance of WBH and their conservation importance. Informative posters and messages were displayed and explained to the floor. During the awareness activities banners / signposts were erected at strategic locations in consultation with the local heads. It will be a reminder for the local communities and will offer long lasting impacts of the project undertaken.

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

Carrying out survey in the rugged and steep topography was the only difficulty faced during the vegetation survey. However, people involved in the survey were enthusiastic to perform the assigned task without much hesitation as they were paid accordingly. This was all possible due to the grant support received from the Rufford Foundation.

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

1. Established a baseline data

This project has been able to document the habitat requirements of WBH at the upcoming captive breeding site. The organisation such as RSPN can further study and make use of my paper in making decision during release of those captive bred WBHs based on preferred habitats by the bird. Besides, any researcher can explore further based on the results generated through my research project.

2. Education and awareness

This project has helped the community people and other relevant stakeholders to understand and expand knowledge on WBH habitats and their conservation threats. With the conservation importance attached with this species of bird, people have now shared their interest and commitment to be more mindful and responsible in jointly working for conservation of WBH and its habitats.

3. Drafting in scientific journals

I will be submitting my research work for publication to the relevant scientific journals.

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

While implementing some of the project activities (awareness trainings, surveys, presentations), many individuals from different organizations one way or other partook in it. Participants were forest personnel, grassroots policy makers, researchers, college trainees/students, personnel from NGO and most importantly, the local community people. We shared pertinent information concerning WBH and its habitats in the study area. In addition, we discussed on way forward as how to mitigate the disturbances posed to the bird and their habitats with active participation of community people. They provided us with the required inputs out of their experiences of sharing the same landscape with the bird.

The community people were involved in carrying out field surveys and primary data collection. Alongside they were acquainted and educated with the importance of conservation of such species and its habitats in their locality. They were provided

with daily subsistence and travel allowances. The community people were also supplied with pictorial educative materials. During the survey and awareness programmes, the local people's vehicles were hired and research team used their logistic for which they also received the monetary gains and edible commodities.

5. Are there any plans to continue this work?

From the presence of nests and the trade-off provided by only one aspect of the study area, it becomes visible that WBH has a specific habitat preference. Given the opportunity I wish to replicate similar research in other habitats of WBH in our country. This would give us a broader picture of the specific habitat preferred by the bird. Furthermore, keeping the community aware and informed on this bird and its conservation implications is deemed important while implementing my project activities.

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

Results will be presented to relevant conservation communities of our country such as selected line agencies under Department of Forest and Park Services, Ugyen Wangchuck Institute for Conservation of Environment and Research, Royal Society for Protection of Nature (RSPN) and College of Natural Resources (CNR). So I will also provide my research paper both in hard and soft copies to these organisations with a request to archive for ready reference. I will request for space to present my research results in every available relevant workshops, trainings, seminars, etc. as possible. I have planned to put up the manuscript of this research project in scientific journals of our country, viz. Bhutan Ecological Society (BES) and Bhutan Journal of Natural Resources and Development (BJNRD). Furthermore, I frequently tour those Districts where the WBH exist, so it would be opportune for me to share my findings and make the people more aware and informed.

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

Usage of The Rufford Foundation grant was for the period of 12 months, starting from September, 2016 to September, 2017. The grant was utilized judiciously and executed all project activities as outlined in 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
Training of research assistants on survey protocol	87	87	0	

Field reconnaissance survey	174	174	0	
Sensitization and awareness meeting on conservation of White-bellied Heron and their habitats to community	920	956.8	-36.8	8 participants more turned up for the programme
Pre-testing of survey questionnaires	34.8	34.8	0	
Educational campaign to local leaders	231.2	231.2	0	
Educational campaign to college/institutions	300	300	0	
Field surveys and data collection	2,175	2,175	0	
Potter charge	21	21	0	
Vehicle hiring charge	200	256	-56	The raise was due to the inflation of fuel price
Pamphlets / brochure for educational program	250	250	0	
Erecting of banners	161	161	0	
Media awareness	57.8	65	-7.2	Charged slightly higher than the estimated rate
Payment for report publishing	86	86	0	
Binocular (1 no.)	300	200	+100	Procured from Jaigoan, India, at much cheaper rate
Total	4997.8	4997.8	0	

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

With the on-going activities of hydropower project along the continuum of the WBH habitat, it is perceived that more different forms of disturbances will be faced by the bird in my study site. Accordingly to provide constant reminder in the form of awareness and sensitization to the officials and workers of the hydropower including the local community, more of such funding support is felt necessary as to expedite and create awareness pertaining to the bird and its conservation implications. More such studies, with key focus on the specific habitat suitability / requirements and some core disturbance factors faced by the bird and its habitat, need to be carried out and issues addressed at the earliest possible as to protect and up-scale the declining population of this bird.

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?

The Rufford Foundation logo was used in all the educational materials disseminated during the time of project implementation. All the presentations that I have made so far, I have used the Rufford Foundation's logo and publicised the foundation to the participants. I have even provided them the Rufford Foundation's website and guided as to how they can access scientific materials therein. People have shown interest and were keen to explore more about the Rufford Foundation.

11. Any other comments?

I would like to kindly acknowledge and thank the Rufford Foundation for generously funding this research project, without which the dream to study on this bird would be next to impossible. I also look forward to receive such support even in the near future. Lastly, I want to conclude with the quote of Edmund Burke "A State without the means of some change is without the means of its conservation".

