

Final Evaluation Report

Your Details	
Full Name	Mohammad Foyzal
Project Title	Status, Breeding biology and conservation of the globally Vulnerable Indian Spotted Eagle (<i>Aquila hastata</i>) in Bangladesh
Application ID	150bfe-1
Grant Amount	£4,850
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Date of this Report	March 2020

1. 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
Understanding population status of the Indian Spotted Eagle in Bangladesh				During the project period (2018-2019), a total of 10 breeding pairs were monitored including four new breeding pairs that were discovered in different parts of the country. In addition, many new sightings were obtained throughout the country by using random survey method and by applying citizen science approach. It is understood that the species is patchily distributed in the plains of the country and discovering new nest was more challenging than previously thought, mainly due to their little-known movement behaviour.
Determining detailed breeding biology and threats of this species in Bangladesh				The breeding biology of the Indian spotted eagle is almost fully understood except for their courtship behaviour (partially observed) and clutch size. However, quantitative data was obtained on mating, nest building roles of sexes, incubation duties and period, nestling period, post-fledging dependency period, natality, mortality, etc. The main cause of chick mortality and nest destruction was seasonal storms but human-eagle conflict is lower than expected.
Protection of existing nesting trees, habitat and plantation of native trees in the breeding hotspots of this species in Bangladesh				Tree owners have been aware to protect the nesting trees and importance of eagle as a biological controller as well as a local pride. Now they are committed to save nesting trees. Two formal presentations were delivered at the forest department (Department of Environment, Forest and Climate Change is the local guardian for wildlife of Bangladesh of Bangladesh

			<p>Government). The department has been informed about the current location of nesting sites that need long-term protection measures by the government.</p> <p>It was not possible to determine any hotspot for Indian spotted eagle as their nesting sites are sporadically located and native plantation has not been initiated yet.</p> <p>Nest searches will be continued in the coming breeding seasons and if any hotspot detect in future, then tree plantation will be done.</p>
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2. Please explain any unforeseen difficulties that arose during the project and how these were tackled.

A few remote sites were difficult to reach on time to study, especially during the monsoon or heavy rain. To solve this problem hosts were selected from the local communities living near the nesting sites, they supported the research team by providing logistics (mainly accommodations), which greatly helped to collect data on time.

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

a). New scientific knowledge: During the study period, a total of 10 breeding pairs and their nests were monitored including four newly discovered pairs through this project. Data on new sighting details were recorded. Nests were recorded on sal (*Shorea robusta*) 14.28%, mango (*Mangifera indica*) 14.28%, red silk cotton (*Bombax ceiba*) 35.71%, Indian wood rose (*Dalbergia sissoo*) 21.42% and Debdaru (*Polyalthia*) 14.28% (n=14 nests). Usually, same nesting tree was used every year, but some cases nested away from usual nesting trees. Interviews targeting nesting tree owners and direct observations suggest that the main reason behind chick mortality is pre-monsoon storms as the chicks fall off the nests or the entire nest is destroyed. Our results also suggest that the reproductive success (only one chick per successful pair) is lower and pairs do not breed every year.

At one nest two nestlings were found and ultimately one survived. A brood size of two was not known previously. Newly fledged chicks are highly vocal. This characteristic greatly assists the researcher to locate newly fledged chick.

Diet consisted of amphibians (mainly frogs), reptiles, medium-sized birds and mammals (exclusively rodents). At one nest, pair exclusively shifted to frogs during monsoon as well as their fledgling.

b). Conservation interventions: To the best of our knowledge this project is the first dedicated work on the Indian spotted eagle in Bangladesh and the countrywide survey is probably the first work in the world. The project worked closely with all

Indian spotted eagle nesting tree owners; they have been thoroughly motivated to protect the nesting trees. They were also informed about the importance of eagle as a biological controller as well as a local pride. All nesting tree owners are now committed to protect the existing nesting trees and inform the project personnel in case of accidental removal of chicks from nests or any other unforeseen incidence. New information on the status, distribution biology and ecology of the Indian spotted eagle collected throughout this project will greatly help to prepare a long-term national and international conservation action plan. In addition, outreach and education (details below) on this threatened species will help to achieve short-term (e.g., nest protection) and long-term (e.g., national action plan) conservation objectives.

c). Outreach and education: People from different walks of life were reached out with messages on the role of raptors especially Indian spotted eagle as a biological pest controller in environment and importance of its conservation. Awareness campaigns involved multi-media presentations, open discussions and distribution of Indian spotted eagle leaflets at local bird club, school, knowledge centre and wildlife centre of Bangladesh Forest department. Moreover, the project involved students, birders and wildlife photographers to motivate on raptor conservation. Some undergraduate students are already motivated and got interested to raptor research and conservation.

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

The project took a citizen science approach in order to obtain biological data by involving local birders and wildlife photographers, who were trained to identify Indian spotted eagle. These trained individuals then reported new sightings and based on their sightings new nests were discovered. Some of them took part nest monitoring work as well.

We interacted with local farmers during data collection around the nest sites. Local farmers were informed on the role of Indian spotted eagle as a biological pest controller of their crops. They were also educated on the negative impact of habitat destruction and overuse of pesticide that will harm not only the eagle but also humans and the environment as a whole.

Local schoolkids were taught about birds, especially raptors, and their importance through awareness campaigns. Now they know about eagles and are aware of the importance of the eagle, as well as the importance of biodiversity and biodiversity richness of their locality through an eagle species. Local bird guides (two from ethnic community) were also involved. Local guides were paid an honorarium for their services in the field, and they were economically benefited through this project.

5. Are there any plans to continue this work?

Yes, a lot of work still needs to be done on this little-known species. For example, understanding population dynamics is needed for its long-term conservation and management. Data acquired through this project has not been enough to understand the population dynamics of this species in Bangladesh. Therefore, we plan to continue working on this eagle. In order to achieve this goal, field visits at nest sites have been initiated already during this breeding season to gather more knowledge on the breeding biology such courtship behaviour and clutch size. Moreover, no hotspot has not been detected yet, with continuous efforts in the field, we hope to identify hotspots in Bangladesh.

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

The results will be disseminated through scientific publications in peer-reviewed journals. To increase the sample size, more data will be collected for better quality publication. The project already delivered various talks within Bangladesh; we plan to continue this with hopes that future results will be shared in international conferences. A report will be submitted to Bangladesh Forest Department, which will help to prioritize Indian spotted eagle for government actions as well as an effective conservation strategy in future.

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

The project period was extended from September 2019 to November 2019 as one pair laid a replacement clutch (eggs laid after the first clutch fails naturally or

artificially). Hence, we monitored the pair and observed their post-fledging behaviour and determined post-fledging dependency period of the chick until November 2019. One unsuccessful pair was also monitored until November 2019 in order to understand their movement patterns from the nest site. These delays did not have any impact on the overall project planning and outcome.

8. Budget: 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. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Local Volunteers (£5/day/person for c. 60 field days)	300	300		
Plantation (40 seedlings, £7.5/seedling; for buying, transportation and look after e.g., fence, fertilizer etc. cost)	300		-300	Failed to detect any hotspot or suitable site. So, plantation not done yet.
Awareness campaign (200 Posters & leaflets, £0.5/piece =£100 + 200 t-shirts, £1.5/piece = £300).	400	400		
Food (£4/day/person, 3 persons for c. 60 field days)	720	700	-20	Food cost were cheaper some remote rural sites.
720 Accommodation (£13/day, 2-3 persons for c. 60 field days)	780	700	-80	Accommodations were cheaper in some remote rural sites.
Transport (Round trip ticket Dhaka-different parts – Dhaka; £20/trip =1200 + local transport; £5/day =300 for c. 60 field days)	1500	1500		
GPS (1, £250/piece)	250	425	+175	A better device bought in higher price according to advice from a GIS expert.
Binoculars (2, £250/piece; 250*2)	500	309	-191	One bought and rest of the money adjusted for GPS buying.
Communication (Phone/Internet/Postal)	100	100		
Totals	4850	4434	-416	

Note: Remaining money will be used to carry out additional field visits to continue this project until the money is finished. If The Rufford Foundation do not agree with this arrangement, then the remaining money will be returned to foundation. We are looking forward to hearing from The Rufford Foundation to advise on this.

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

The most important next steps are as follows:

a). Population dynamics: According to BirdLife International (2020), the species is poorly known, thought to have a small and declining population and classified as globally threatened. Further studies on the breeding biology will help to understand the population dynamics of a species. Long-term study on population dynamics will also help to reveal the cause or causes of decline and threat. So, more nests and breeding pairs should be studied. To fulfil this purpose the team will keep searching for more nests and new breeding pairs.

b). Movement pattern: This species poorly known, rare, patchily distributed and threatened in Bangladesh. Movement pattern is still unknown. So, the species was harder to study than previously thought. During the short project period movement pattern of adults and juveniles studied in small scale. More field studies should be conducted to understand their movement pattern. To better understand their movement patterns colour ringing, radio or satellite transmitter tagging is suggested.

c). Foraging ecology: To understand the food source in environment, foraging ecology study is extremely important. How the species forage in and around nest site, how far from nest site, use of habitat by independent juveniles is poorly known. Small-scale data collected on this topic during this project, more data is required for better understanding.

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

The Rufford Foundation logo was used on all presentations, as well as in awareness campaign materials like leaflets, poster, t-shirts produced during the project. The support will be acknowledged in scientific publications in peer-reviewed journals and during presentations in conferences and seminars in future.

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

Project supervisor: **Sayam U. Chowdhury**, Conservation biologist and assistant coordinator at Spoon-billed Sandpiper Task Force.

Co-supervisor: **Dr. Monirul H. Khan**, Wildlife Biologist, Professor at Jahangirnagar University, Savar, Bangladesh.

Field assistants: **Sahfiqur Rahman, Samir Saha** and **Omar Shahadat**: conservationist and member of Bangladesh bird club.

Salah Uddin Jadid, Sajib Bishwas, Shawan, Haris Debberma, Rasel Debberma and **Syed Shahnoor Inam**: University students.

Firoz Al Sabah, Tarik Hasan and **Ahmaduzzaman Shovon**: local wildlife photographer.

Azizul Haque: Local schoolteacher.

Awareness material designer: **Sayda Mizan**, artist and project director at Uronto Residential Art Exchange Program and **Nazim Uddin Khan**, conservationist and member, Bangladesh bird club.

12. Any other comments?

I am highly grateful to The Rufford Foundation for this very useful grant. This grant made my research and conservation work on this threatened species valuable. I would like to thank my whole project team. This dynamic team helped me in many ways, without their support it would have been harder for me to make the project successful.