

Final Evaluation Report

Your Details	
Full Name	Rohan Krish Menzies
Project Title	Habitat selection and genetic diversity of the Critically Endangered White-bellied Heron Ardea insignis in eastern Arunachal Pradesh
Application ID	37739-1
Date of this Report	12/05/2025

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
1) Understanding impacts of anthropogenic activities (e.g., fishing and mining) on the White-bellied Heron and its habitat.			Yes	<p>From November 2023 to March 2024, we surveyed 42 sites (500m each), across the Kamlang and Namdapha Tiger Reserves. We visited each site 5 times for a total effort of 105km. Within the core area of Namdapha, there were 18 sites visited 5 times (effort = 45km) along the Deban, Namdapha, and Noa-Dihing Rivers. During the surveys, the anthropogenic activities were recorded at every 50m point in the transect. The White-bellied Heron was spotted twice, both times out of survey.</p> <p>When we compared the anthropogenic activities to previously published data, we found that we found evidence of fishing in 5.6% of segments in 2017 (Menzies et al., 2021) versus 1.8% of segments in 2023-24 despite having nearly four times the effort. Similarly with human presence, in 2017, it was observed in 9.5% of segments (Menzies et al., 2021) and 7.6% of segments in 2023-24, respectively. Based on the anthropogenic activities recorded during the 2017 and 2023-24 surveys, there is a slight reduction in human use in the protected area. During the</p>

				more intensive surveys as well, we did not find the White-bellied Heron outside the Protected Area. This implies that they generally prefer the less-disturbed areas. However, the reduction in their encounter rates within PA over time, is worrisome, despite reduction in human activities. This points towards the potential role of stochastic factors in driving potential declines in their as it is small populations, an aspect that needs further investigation.
2) Understanding habitat ecology of the White-bellied Heron, which is vital for developing conservation strategies for the species in the area.			Yes	The habitat information was gathered from the limited number of White-bellied Heron sightings from February 2023 to March 2024. The habitat associated the most with the heron includes fast flowing, rocky stretches of the river. Moreover, the related impacts on the habitat were also recorded and the reduction in the anthropogenic pressures on these habitat features have also been noted in the region. The pressures have reduced since 2017.
3) Estimation of minimum population size of the eastern Arunachal Pradesh population.		Yes		The fieldwork did not result in the collection of DNA samples; however, we were able to ascertain how low the White-bellied Heron numbers are particularly in the core protected area which informs us of the size of the remaining population but it is less accurate than a rigorous DNA analysis.
4) Determination of genetic diversity and inbreeding in the population.	Yes			The extremely low occurrences of White-bellied Heron rendered the collection of faecal samples impossible.

<p>5) Orientation of the Forest Department staff about the White-bellied Heron and training in monitoring White-bellied Heron populations.</p>		<p>Yes</p>	<p>We were able to orient 10 members of the Forest Department about the White-bellied Heron and informed them of the importance of its conservation. Our field assistants were trained and informed in greater detail. While there were no formal meetings or workshops with every member, largely due to the fact that several had not seen the species before, it was more focused interactions with key members. The Forest Department is understaffed. Moreover, our camp sites were remote and not easily accessible. While, we had suggested the local officers to send Forest Department staff to accompany us during our surveys. They were unable to join. However, one of our team members had joined the Forest Department after the completion of our project.</p> <p>The reasons that several staff had not seen the heron is because of no orientation done by the Forest Department for the field staff. In the absence of this training, we strongly feel the bird gets overlooked by the forest department staff. Only staff that act as bird guides or are interested in the natural history of the place (a few of them are) are familiar with the species. As a first step, there is a need for orientation of the field staff to inform them about the important endangered and threatened species in Namdapha. Additionally, there is a need for a</p>
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				<p>dedicated Forest Department team to study and conserve the White-bellied Heron. Given that the birds nest between April and July, finding and monitoring the nests in this remote site is extremely challenging. This and the associated logistical difficulties to access, camp and study during the peak monsoon period will pose significant challenges in studying different aspects of white-bellied heron ecology.</p> <p>We strongly feel that the river transects can be a valuable tool to map and monitor White-bellied Heron distributions in the landscape. In our own case, we were able to discern a drop in encounter rates of the species over time. We have informed the Forest Department about this and we hope they take up the monitoring systematically. In any case, we will continue to monitor the population of the heron periodically.</p>
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2. Describe the three most important outcomes of your project.

a). The population of the Critically Endangered White-bellied Heron (*Ardea insignis*) within the Namdapha Tiger Reserve appears to have drastically declined.

b). The reasons for the reduction in heron numbers are uncertain; however, the human presence and activities have reduced since 2017, yet the birds occur less frequently in the core zone of the Protected Area.

c). This study highlights the need to regularly monitor the river reaches away from the core area to locate the current stretches regularly occupied by the White-bellied Heron and to explore the best steps required to conserve these regions. We hope to periodically monitor the population of the White-bellied Heron. While we have informed the forest department to monitor White-bellied Heron, we are not sure if

they will be able to pursue it. It is also heartening to know that a few other organisations are also studying the heron and so we hope to monitor the White-bellied Heron population periodically. We have also uploaded the transect locations within Namdapha TR which can be used to monitor the species (<https://zenodo.org/records/16928056>).

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

- The extremely low occurrences of White-bellied Heron rendered the collection of faecal samples impossible. The two occasions on which an individual was observed during the five survey months were in locations which could not be accessed on foot. The herons were found away from the river bank and these stretches could not be crossed.
- In conversations with the local community members, especially those who frequent the rivers and members of the forest department, we learnt that the frequency of White-bellied Heron sightings was generally low. Regardless of our survey efforts, we did not gain any insights on where we would be able to locate herons and collect faecal samples for our analyses. The Namdapha River, for example, which used to be a hotspot for the species in the past, appears to be completely abandoned by the heron in recent years.
- Although the rains in Namdapha usually begin in May, in 2024 there were heavy bouts of rain which began at the end of January which hindered our sampling. Additionally, were we to find White-bellied Herons at that time, faecal sample collection would have been virtually impossible. It is also possible that the herons were less active during those weeks of early rain.

4. Describe the involvement of local communities and how they have benefitted from the project.

There were extensive conversations with members of the local community as well as those employed by the forest department. We tried to gather information about White-bellied Heron sightings, the distribution of the species, the locations and frequency of sightings, and the possible reasons for their absence in the area. Although our work did not benefit a great deal directly in terms of sample collection, during each conversation, we tried to inform each person about the rarity of the heron and the importance of its conservation. A long-time associate and local community member, Mr. Japang Pansa, was appointed as a local guardian and will continue to gather information on White-bellied Heron sightings from Namdapha. Our two field assistants, Mr. Dhan Bahadur Limbu and Mr. Laiphung Wangnow, have gained significant work experience along the rivers in particular. They were taught how to identify the White-bellied Heron, along with other river bird species, and were spoken to in detail about the history and current state of the species. They are both now sufficiently experienced in the field to potentially be employed by the forest department in the near future which would certainly benefit the monitoring and conservation efforts of the White-bellied Heron.

5. Are there any plans to continue this work?

While we will not directly continue this work in the region, we are working with White-bellied Heron experts from other countries to formulate conservation plans for the species. The low numbers of herons observed at Namdapha and the global populations call for a more unified effort in conserving the species.

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

We have one paper published at Oryx which highlights our findings from our survey efforts as well as highlights the anthropogenic impacts and habitats required by the White-bellied Heron. The following is the citation for the preprint:

Menzies, R. K., Suryawanshi, K., & Naniwadekar, R. (2024). Is the population of the Critically Endangered White-bellied Heron declining in Namdapha Tiger Reserve, India? *Oryx*, 58 (6), 730-734.

An additional report on Vulnerable Asian Small-clawed Otters (*Aonyx cinereus*) was also published thanks to this grant. The following is the citation:

Menzies, R. K. (2023). An Update on Asian Small-Clawed Otters (*Aonyx cinereus*) From Namdapha Tiger Reserve, Arunachal Pradesh, India. *IUCN Otter Spec. Group Bull*, 40(4), 225-229.

There will be other scientific articles submitted soon on the other river birds (table below) and opportunistic mammal sightings during the surveys.

Sl. No.	Common Name	Scientific Name	IUCN Status	Number
1	River Lapwing	<i>Vanellus duvaucelii</i>	Near Threatened	63
2	Blyth's Kingfisher	<i>Alcedo hercules</i>	Near Threatened	1
3	Great Cormorant	<i>Phalacrocorax carbo</i>	Least Concern	968
4	White Wagtail	<i>Motacilla alba</i>	Least Concern	701
5	Plumbeous Redstart	<i>Phoenicurus fuliginosus</i>	Least Concern	363
6	White-capped Redstart	<i>Phoenicurus leucocephalus</i>	Least Concern	157
7	Slaty-backed Forktail	<i>Enicurus schistaceus</i>	Least Concern	120
8	Brown Dipper	<i>Cinclus pallasii</i>	Least Concern	103
9	Common Kingfisher	<i>Tringa nebularia</i>	Least Concern	94
10	Common Sandpiper	<i>Actitis hypoleucos</i>	Least Concern	82

11	Crested Kingfisher	<i>Megaceryle lugubris</i>	Least Concern	81
12	Small Pratincole	<i>Glareola lactea</i>	Least Concern	79
13	Striated Heron	<i>Butorides striata</i>	Least Concern	72
14	Ibisbill	<i>Ibidorhyncha struthersii</i>	Least Concern	51
15	Little Forktail	<i>Enicurus scouleri</i>	Least Concern	51
16	Blue Whistling Thrush	<i>Myophonus caeruleus</i>	Least Concern	48
17	Little Egret	<i>Egretta garzetta</i>	Least Concern	46
18	Gray Wagtail	<i>Motacilla cinerea</i>	Least Concern	41
19	Pied Kingfisher	<i>Ceryle rudis</i>	Least Concern	39
20	Common Merganser	<i>Mergus merganser</i>	Least Concern	36
21	Black Stork	<i>Ciconia nigra</i>	Least Concern	35
22	Hodgson's Redstart	<i>Phoenicurus hodgsoni</i>	Least Concern	30
23	Green Sandpiper	<i>Tringa ochropus</i>	Least Concern	27
24	Long-billed Plover	<i>Thinornis placidus</i>	Least Concern	26
25	Common Greenshank	<i>Tringa nebularia</i>	Least Concern	25
26	Black-backed Forktail	<i>Enicurus immaculatus</i>	Least Concern	20
27	Blue Rock-Thrush	<i>Monticola solitarius</i>	Least Concern	17
28	Red-wattled Lapwing	<i>Vanellus indicus</i>	Least Concern	16
29	White-throated Kingfisher	<i>Halcyon smyrnensis</i>	Least Concern	12
30	Gadwall	<i>Mareca strepera</i>	Least Concern	11
31	White-crowned Forktail	<i>Enicurus leschenaulti</i>	Least Concern	10
32	Osprey	<i>Pandion haliaetus</i>	Least Concern	8
33	Ruddy Shelduck	<i>Tadorna ferruginea</i>	Least Concern	8
34	Wallcreeper	<i>Tichodroma muraria</i>	Least Concern	8

35	Little Ringed Plover	<i>Thinornis dubius</i>	Least Concern	7
36	Daurian Redstart	<i>Phoenicurus aureus</i>	Least Concern	3
37	Common Snipe	<i>Gallinago gallinago</i>	Least Concern	2
38	Indian Pond-Heron	<i>Ardeola grayii</i>	Least Concern	2

Conference Presentations

Menzies, R. K., Suryawanshi, K., & Naniwadekar, R. (2024). Assessing the importance of Protected Areas on river birds in Eastern Arunachal Pradesh, India. Oral Presentation at the Indian Wildlife Ecology Conference (IWEC 24), National Centre for Biological Sciences (NCBS), Bangalore, India held on 14-16 June 2024.

Menzies, R. K., Suryawanshi, K., & Naniwadekar, R. (2024). Understanding the relative importance of environmental and anthropogenic drivers on river bird communities in the Eastern Himalaya. Oral Presentation at the Nature Conservation Foundation (NCF), Annual Meet, 29-30 August 2024.

Menzies, R. K., Suryawanshi, K., & Naniwadekar, R. (2025). Monitoring a Critically Endangered species: Is the White-bellied Heron (*Ardea insignis*) declining in Namdapha Tiger Reserve, India? Oral presentation made at the European Conference of Tropical Ecology 2025, Amsterdam, Netherlands.

Menzies, R. K., Rao, M., Jithin, V., Suryawanshi, K., & Naniwadekar, R. (2025). Understanding the relative importance of environmental and anthropogenic drivers on Eastern Himalayan river bird communities. Oral presentation made at the European Conference of Tropical Ecology 2025, Amsterdam, Netherlands.

Workshops & Meetings

Attended a knowledge-sharing workshop for the conservation of the globally threatened White-bellied Heron conducted by the Royal Society for Protection of Nature (RSPN) – Bhutan, at the Wildlife Institute of India (WII), Dehradun, India on the 24th and 25th of August, 2024.

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

- Regular systematic surveys in the eastern part of Namdapha Tiger Reserve are required immediately. There appear to be greater occurrences in the eastern region; however, we do not know the river stretches continually occupied by the White-bellied Heron.
- Systematic efforts are required to locate and monitor White-bellied Heron nests. There has been a recent report of one successful breeding effort of the species from Namdapha, therefore a more rigorous approach with regard to locating and protecting nesting sites is needed.

- A better understanding through surveys and more focused efforts along the Namdapha River, a former stronghold for the species, would be beneficial in perhaps restore it or preserve it better in order for the heron to re-occupy that large expanse.
- A joint effort between Bhutan, Myanmar, and India would help with conservation management planning for the White-bellied Heron at the global scale. This could start with an update on the species management plan which was previously updated last in 2015.

8. 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 in all oral presentations, official meetings and workshops that are listed in point no. 6 of this document. We have acknowledged Rufford Small Grants in all the peer-reviewed publications.

9. Provide a full list of all the members of your team and their role in the project.

Rohan K. Menzies – Conceptualised the study, conducted fieldwork and gathered data. Currently analysing the data and preparing manuscripts.

Rohit Naniwadekar - Helped conceptualise the study, oversaw work progress on and off the field, helped with data collection, provided local community contacts, currently overseeing analysis, and manuscript preparation.

Kulbhushansingh Suryawanshi & Jahnavi Joshi - Helped conceptualise the study, oversaw work progress on and off the field, currently overseeing analysis, and manuscript preparation.

10. Any other comments?

No.

ANNEX – Financial Report

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