



Behavioural Monitoring and Threats Assessment of Ibisbill (*Ibidorhynchastruthersii*) in the Wintering Site, East Rapti River, Hetauda, Nepal

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Abstract: Ibisbill is a resident breeder in the Himalayas and winters in the lower Terai of Nepal. It has been nationally assessed as Endangered due to disturbance, hunting, habitat loss and climate change. We did a field survey in the East Rapti River from Late November 2022 to Mid-March 2023 to assess the population status, behaviour and threats in the Ibisbill wintering ground. Observations on the behaviour were made at three selected sites, each of 1.5 km transects. Household survey was conducted with 50 respondents using structured and semi-structured questionnaires to assess the prominent threats along with direct observations. A total of six Ibisbills were recorded during the study period in the wintering ground. Ibisbills fed on both terrestrial and aquatic invertebrates including stonefly, mayfly and caddisfly larvae. Feeding and Foraging accounted for 55% of the total activity time in winter followed by Resting (22%). During the survey, the bird was quite inactive and solitary as well as found to be good swimmers, preferring to cross rivers by swimming rather than flying. People in the vicinity of the East Rapti River reported that extraction of stones and boulders, pollution and disturbances by human activities were major threats to Ibisbill. We recommend further monitoring of the species and protection of the wintering grounds from excessive anthropogenic activities.

Keywords: Population, Activities, Observations, Foraging, Threats, Ibisbill

1. Introduction

Ibisbill is the resident wader of the Himalayas belonging to the family Ibidorhynchidae under the order Charadriiformes of the birds. It has a grey body with black face, down-curved dark red bill, white belly, red legs and black breast band. It inhabits the fast flowing mountain streams and rivers with shingle beds and can be found at the altitudinal range of 3800-4200 m during breeding season and 100-915 m during winter [3]. It is widely distributed in Nepal, India, Afghanistan, Bhutan, China, Pakistan, Russia, Myanmar, Kyrgyzstan, Kazakhstan, Tajikistan, Turkmenistan, and Uzbekistan [2].

In Nepal, it is mainly found in Kyangjin, upper Langtang valley and Sagarmatha National Park; Makalu Barun National Park and Khaptad National Park in summer,

whereas in winter it migrates from higher to lower altitudes and is seen along the Rapti river in Hetauda and the lower Arun river [5, 9]. It is often difficult to notice because of its high camouflage ability.

Ibisbill has been nationally assessed as Endangered and globally as Least Concern, mainly due to disturbance, hunting, habitat loss and degradation and climate change [1, 2, 6]. The global population of Ibisbill is still unknown. However, in Nepal, its population is estimated to be in between [6]. There has been relatively limited research on the status of Ibisbill in Nepal. This study was therefore carried out to monitor behaviour and assess threats in the wintering ground of Ibisbill in central Nepal.

2. Methods and Materials

2.1. Study Area

The study was conducted from late November 2022 to mid-March 2023 along the East Rapti River in Hetauda, Makwanpur District, Nepal, located at 27°24'59.99" N and 85°01'60.00" E, with an average elevation of 350 meters. The East Rapti River originates in the Mahabharat Mountain

Range and merges with the Narayani River. Samari, Karra, Kukhreni, Reu, Panchand, Lothther and Manahari are the major tributaries. It is a meandering river in the upper stretch and becomes braided in the middle to downstream stretches. The beds of the river comprise mainly cobbles, boulders, with some underlying pebbles and patches of sand and silt at few places, serving as an ideal habitat for Ibisbill and other riverine birds.

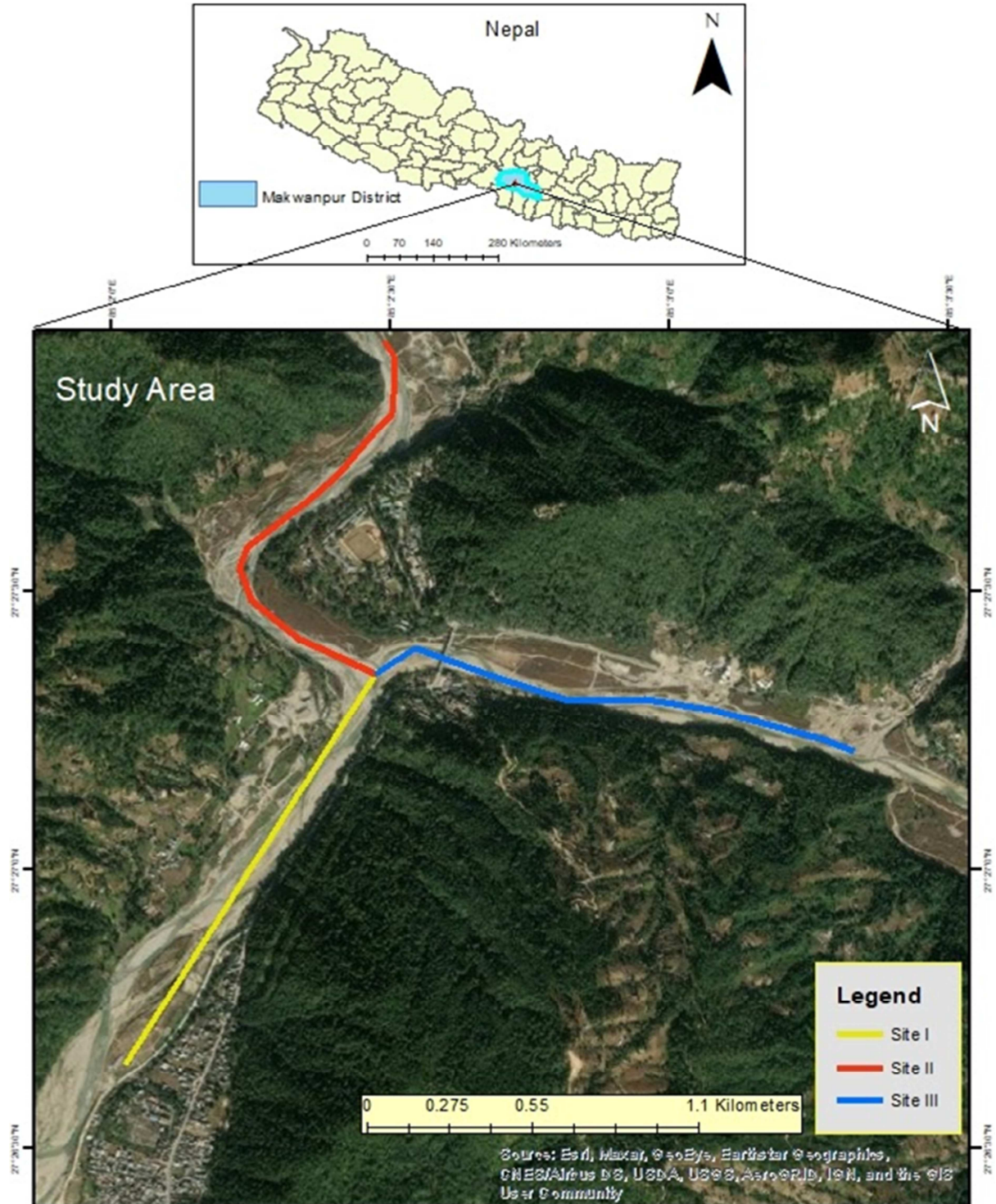


Figure 1. Map of Study Area.

2.2. Methods

The survey was carried out once a week by two observers in the morning (7:00-10:00 AM) from Late November 2022 to Mid-March 2023 covering the winter season. Three sites were selected for the survey, each of 1.5 km transect (Table 1), considering probable habitats and experiences from previous observations for behavioural monitoring and assessment of population status. In total, sixteen surveys were carried out in the sites. Observations were made along the transect line using a pair of binoculars (10×40) and photographs were taken with a Canon Power Shot 45X camera. Ibisbills seen and heard, as well as overall behavioural observations were recorded. Behaviour of Ibisbill was categorized as Feeding and Foraging, Resting, Locomotion, Alert and Others [10, 11]. Household survey was conducted with 50 respondents using structured and semi-structured questionnaires along with direct observations to collect information about the prominent threats in winter ground of Ibisbill.

Table 1. Study Sites.

Study Site	Site Location	Transect (km)
Site I	Army Camp to Trikhandi Temple	1.5
Site II	Samari Bridge to Manakamana Road	1.5
Site III	Samari Bridge to Suspension Bridge	1.5

2.3. Data Analysis

Microsoft Excel was used to analyze the collected information and present the results in the form of charts and tables.

3. Results

3.1. Number of Ibisbill Recorded

During the study period, a total of 6 Ibisbills were recorded. Four Ibisbills were recorded from site II whereas two were recorded in site III and not recorded from site I (Table 2). Figure 2 shows a pair of Ibisbill adults sighted during the survey.



(Photographed by Nahakul Bhusal)

Figure 2. A pair of Ibisbill adults in East Rapti River.

Table 2. Population Status of Ibisbill in East Rapti River.

Study Site	Number of Ibisbill	Recorded Date
Site I	-	-
Site II	4	26 December, 2022
Site III	2	2 January, 2023

3.2. Activities of Ibisbill

During the survey, we observed different activities of Ibisbill where Feeding and Foraging contributed to 55% of the total activity time in winter followed by Resting (22%), Locomotion (13%), Alert (6%) and Others (4%) (Figure 3).

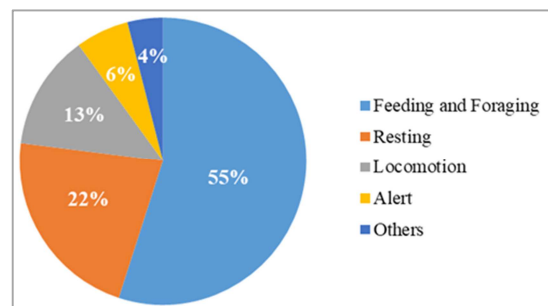


Figure 3. Time spent by Ibisbill on various behavioural activities in winter.

3.3. Feeding and Foraging

The feeding and foraging activities of Ibisbill were mainly observed in the water body. Probing and pecking techniques were used by Ibisbills while foraging in water. The birds were observed to feed by pecking and probing the prey among the gravels and boulders on river beds. Ibisbills fed on both terrestrial and aquatic invertebrates including stonefly, mayfly and caddisfly larvae attached with boulders and rocks. They were also found preying on small fishes. Ibisbills were often observed in same flock of River Lapwing (*Vanellus duvaucelii*) while foraging.

3.4. Other Behavioural Activities

Ibisbills are generally solitary birds. However, they were found in a small flock of four birds during the survey. They produced a ringing 'klew-klew' and rapid 'tee-tee-tee-tee' call and appeared closely related to oystercatchers, avocets and stilts. They were found to be good swimmers, preferring to cross rivers by swimming rather than flying. Ibisbills were quite inactive during winter, but as the breeding season approached, they became more active and noisy. The Ibisbills were observed to run short distances, hold their heads downwards and stand erect only to explore the surroundings.

3.5. Threats

The major threats to Ibisbills as per the respondents' perceptions and direct observations were as follows:

1. Extraction of stones and boulders

The primary habitat of Ibisbills has been severely degraded by extraction of stones and boulders in large quantities. There are four crusher industries in the vicinity of the river. Many

equipments and heavy vehicles are used in the sites.

2. Pollution in river

During the survey, we observed people throwing waste in the river. Some people were also found poisoning the river water for fishing. Besides these, chemical wastes from the industries have polluted the river and affected water birds.

3. Changes in river flow

Local people sometimes change the flow of water for irrigation and other purposes like fishing. This has influenced the occupancy of prey items in the sites.

4. Disturbances by human activities

During the survey, we found many people gathered on the river bank for washing clothes, fishing, and collecting stones and pebbles. Many teenagers were observed photographing and filming. All these activities including construction of embankments and army training on the river bank have created disturbances for the wintering birds.

4. Discussion

Ibisbills are regularly sighted along the East Rapti River in Hetauda between late November and mid-March, where three birds were first recorded in December 1970 [7]. Shrestha and Lakhey, 2000 also recorded eighteen individuals of Ibisbill with three sub-populations along the Rapti River. A total of

six Ibisbills were recorded throughout the study period. The population of Ibisbill was found highest in site II (Table 2) as it had suitable feeding and wintering grounds. Such variation in the population of Ibisbill might have occurred due to habitat degradation and disturbances by human activities. Feeding, Foraging and Resting contributed to 77% of the total activity time of Ibisbill in winter and the remaining was occupied by other behavioural activities (Figure 3). Foraging mainly involved probing under rocks and gravels on shingle banks and aquatic invertebrates especially stoneflies, mayflies and caddisflies were the main prey [8]. Ye *et al.*, 2013 also reported that foraging and resting behaviours of Ibisbill occupied more than 80% of the total activity time in winter. In addition, foraging was found to contribute about 62% of the total activity time of Ibisbill in winter during the study carried out in River Sindh [4]. This shows that the Ibisbill spends most of its time in search of food during the winter season. Disturbance by human activities was found to be a major threat to Ibisbill in the East Rapti River including extraction of stones and boulders (Figure 4). Perception of respondents regarding the changes in river flow was found divided (Figure 4). The habitat of Ibisbill has also been affected by water pollution, sand and gravel mining of river beds and other surface quarrying and climate change [6].

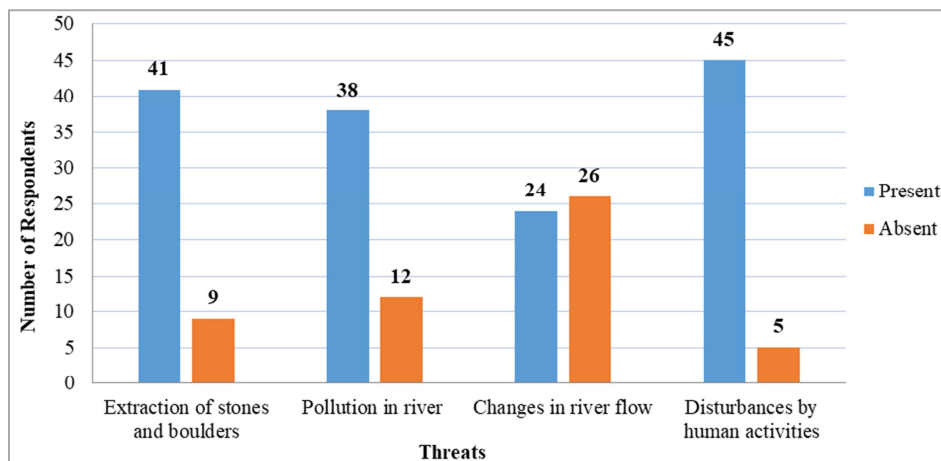


Figure 4. Perceptions of respondents regarding threats in winter ground of Ibisbill.

5. Conclusion

Our findings reveal that the East Rapti River provides an ideal habitat for Ibisbill. However, anthropogenic activities need to be controlled in order to protect the habitat and ensure better feeding grounds for Ibisbill and other water birds. Further intensive research and regular monitoring should be carried out to acquire more information about the ecology of Ibisbill in the East Rapti River.

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