

Impact of Recreation and Social Activities on White Bellied Heron along Phochu River, Punakha

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Summary

This study was conducted along Phochu river basin from Samdingkhar till Lekithang (confluence of Phochu and Mochu River) in Punakha Dzongkhag, transact line corresponding to the rafting zone in the river. The study confirmed that there is negative impact on the White Bellied Heron (wbh) due to rafting, camping, fishing, and firewood collection along the river. All the respondents (N=50) indicated that number of wbh along Phochu river is decreasing due to the disturbance and habitat degradation due to the aforementioned activities, resulting in lesser inbreeds. Although wbh are not hunted by local people, illegal fishing and setting up of fishing equipment are still prevalent. Moreover, rafting area along the Phochu River corresponds to the regular wbh habitat, thereby significantly impacting the water bird. Camping in wbh significant sites (Tsaykha, Khawakha, Namseling) are prohibited, however, such activities are still common and detrimental to the conservation of the wbh.

This study recommends frequent monitoring of wbh and threat factors (camping and fishing) in common site of wbh to maximize the conservation effort and minimize the disturbance. Scheduled and monitored rafting and collection of river-driven wood is also recommended.

Rationale

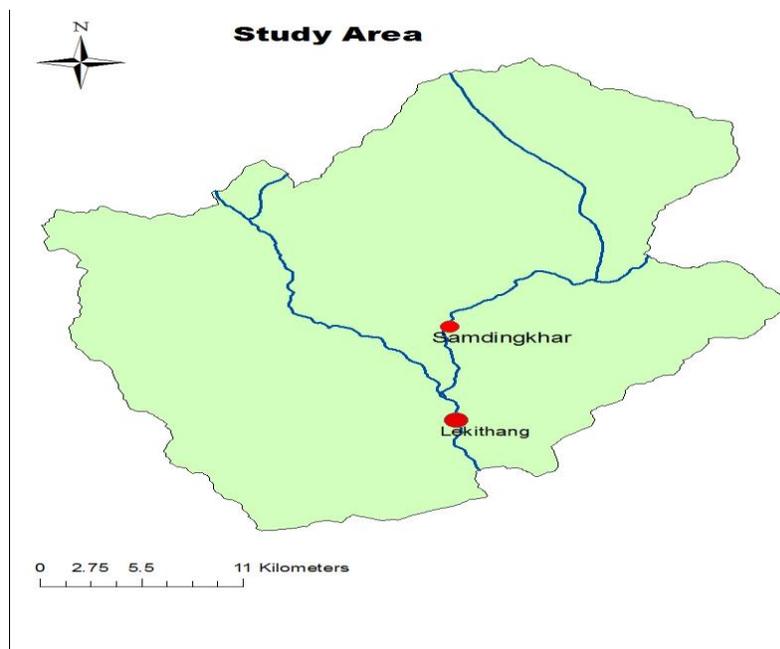
In Bhutan, White-bellied herons are commonly found near Punatshangchhu and Berti river Basins. Punatsangchu River Basin is the main habitat of *Ardea insignis* in Bhutan with 26 individuals. The *Ardea insignis* is it is under massive threat due to developmental activities, despite different conservation efforts. The birds were observed along the Phochu, confluence of Phochu-Mochu, Punatsangchhu, Kamechu (Digchu), Zawa, Ngagshina and Burichu.

With increasing recreational and social activities along Phochu River, the habitat for the WBH is altered irreversibly. Frequent rafting, camping, and social activities along Phochu Basin is likely to narrow the habitat for White-bellied heron. Pho Chu provides a Class III whitewater rafting with fun intermediate rapid with its approximately 16 km course and about 15 rapids to national and international tourist. Presently four rafting companies (Lotus adventure, Druk Rafting, Telephe and Exposure Bhutan) were approved by Tourism Council of Bhutan. Lotus Adventure was the first rafting service in Bhutan operated since 1996. Phochu basin, having a pristine environment, attracts lots of international and national tourist for camping and birding which is likely to deter the herons.

Punakha is one of the tourism hotspots, attracting both national and international tourists for frequent camping and picnic. Public gathering, waste generation in and around the river basin, and maximum noise pollution are threatening wbh. Therefore, this study provides clear idea on how and to what extend the recreational and social activities are impacting the habitat of wbh. It will also help in developing strict environmental policy and acts to conserve those species.

Study Area

The study was conducted along Phochu river basin which stretches up to 17 kilometers from Samdingkhar till Lekithang, which is the common area for rafting and camping in Punakha. Phochu provides a class III whitewater rafting along the rapids that also provides the attractive views of the Punakha Dzong and sightings of the endangered White Bellied Heron, Kingfishers, and occasional otters on the river beach. These attractions make the basin one of the most-sought after tourist destination for both national and international tourists, who involve, *inter alia*, in camping and birding. Currently, there are four rafting companies approved by the Tourism Council of Bhutan operating along the Phochu and Mochu Rivers. However, the area is also an important habitat for the White Bellied Heron which is one of the most critically endangered species listed in IUCN Red list.



Materials and Methods

Phase I: Mapping Overlay

The study was carried out from 5th January to 10th April, 2018. Impact of recreational and social activities on wbh was assessed by comparative analysis by locating their sites and determining if wbh habitat and threat factors are located in same place. Common area of wbh habitat and its location were assessed and recorded by Global Positioning System (GPS). Rafting area (Start-End point), common camp site and social activity sites, were also recorded in GPS and final map was designed using Geographic Information System (Phase I).

Phase II: People's Perception

From the first phase, it shows that rafting, camping, fishing, and firewood collections which are common activities in the area of wbh which includes Samdingkhar, Namtselung, Khawakha and Tsaykha. In Phase II, data covering impact of recreational and social activities on wbh habitat were collected from wbh experts. Close and open structure questionnaire covering impact intensity, options to reduce impact, and other necessary suggestions were designed and data were collected from rafting company owners, Punakha Dzongkhag Environment Officer and Dzongkhag Planning Officer, foresters, Environment officers, students, local residents, Non-Government Organization, and academicians. Common observation and views about impact of rafting and camping service were also collected.

Phase III: Awareness Program

Since most of respondent recommended the need of an advocacy program, one-day seminar was conducted on environment, waste management, and particularly on wbh. Way forward and individual responsibilities in the conservation of wbh were discussed with students of Dashiding Higher Secondary School, Bajothang HSS, Ugyen Academy and College of Natural Resources. Global Positioning System, camera, binoculars, data sheets, and power points were used in capturing, storing, synthesizing, interpreting, and displaying of the information and knowledge of the study.

Finding and discussions

The four-month long study made the following main observations:

1. Habitat area and threat factors coincidence (Phase I)

According to the local people's views and previous research studies by RSPN, common areas of wbh for foraging and roosting include Khawajara, Tsaykha and Namseling. According to the rafting owners and local people, area for rafting in Phochu stretches up to 17 kilometers from Samdingkhar till Lekithang which coincides with the common residence of wbh. Though RSPN has banned all the camping sites in TsayKha, Namsaythang and Khawakha, onsite physical observation by the researcher and the local people's observations have confirmed the presence of visitors in Tsaykha, Samdingkhar and along the river. Camping and holding nights are major activities observed thereby causing potential disturbance to the wbh especially in the morning and in the evening. With progressive development, Phochu basin holds significant number of settlements and encourages several economic activities. Monsoon seasons lead to the increase in the volume of the river and causes it to carry huge quantities of boulders and logs from higher altitude which are deposited along the banks of TsayKha, Khawajara, Samdingkhar and Namsaythang. In the dry seasons, the local people collect the logs boulders for firewood and construction activities. Frequent traveling and use of chainsaws disturb the habitat and wbh in their normal foraging and roosting routines in their habitat. These human interactions with the natural habitat of the wbh are significant threat factors to the wbh and conservation efforts thereof.



Potential Threats on wbh (Phase II)

Fifty respondents (40 males and 10 females) who have knowledge about wbh were identified and interviewed. The respondents include foresters, senior researchers, local people, academicians, environment officers, planning officers, rafting owners, and students.

Out of 50 respondents, maximum (26%) were with forestry background that had field experience and carried several research on wbh. The questionnaires covered the following impact factors:

1. Rafting

Rafting is taking place in Phochu- Mochu basin and Manas River in Bhutan. 78.3% of total respondent reported having observed decrease in wbh population along Phochu over the years which they attribute to habitat degradation, disturbances, and genetic inbreeding owing to small size of population. All respondents found that river rafting has significant negative impact on wbh due to noise generation, paddling, and public encroachment and, indirectly, through improper waste disposal. Although there is no record of direct physical damage to the bird, rafters were found to make noise and follow the wbh to take photographs.

Although these human interactions in the area are detrimental to the conservation of the endangered wbh, socio-environmental tourism services such as rafting are critical attraction of tourism sector in Bhutan. Thus, imposing restriction on these services is not feasible.

However, to promote sustainable ecosystem and for conservation of wbh, respondent recommended to fix a standard time by properly considering the least impact on the foraging time of wbh. To reduce impact on wbh, regular briefing to rafters about wbh and its common site is also recommended. Reducing noise, proper waste management and waste disposal, and monitored paddling intensity in wbh habitat sites are some of the significant recommendations proposed by the respondents.

2. Camping

The most common camp sites along pristine Phochu River are Samdingkhar, Tsay-kha, Walakha and Lekithang, which are also the common foraging sites for wbh. 25% of the respondent reported that they had camped along Phochu River during winter season. Though camp sites were banned strictly in Tsay-kha, Khawakha and Namsaythang, local people have found outsiders camping in Tsaykhar.

In order to enhance conservation of this critically endangered species, 84% of respondents recommended requirements of proper instructional notice boards and frequent monitoring in the common residence of wbh.



Figure: Camp site along Phochu River; 2017

3. Illegal Fishing

One of the main threats to the wbh is the intensive level of fishing activities. Though fishing along Punatsangchu River is strictly banned, illegal fishing is still occurring. Human fishing pressure could substantially alter the foraging ecology of wbh and pose a great threat to the species survival in these critical habitats. 40% of the respondents had seen people fishing along the river and also the fishing equipment like gill net and cast net in the river with fishes being trapped. The illegal fishing and placing of nets were spotted by the rafters, foresters and owners of rafting companies, especially in the early morning. Fishing along the river not only reduces the food for wbh but also disturbs the bird and its habitat through movement. In order to minimize the impact, frequent monitoring by foresters and advocacy programs are essential.

4. Hot spring bathing and firewood collection

In summer, the heavy rainfall increases the river volume and it washes large quantities of boulders and logs from higher altitudes. This debris is deposited along the river banks of TsayKha, Khawajara, Samdingkhar and Namsaythang, areas which are common habitats for wbh.

During cold winter season, local people gather the logs and boulders for construction and for firewood which can take more than a month. Frequent traveling and noise produced by the chainsaws disturb the habitat of wbh for their normal foraging and roosting along the river. Not only the abundance of huge boulders and logs attracts the local people, but also the magnificent pristine nature attracts outsiders for various social activities such as hot-spring bathing.

Advocacy program (Phase III)

Respondents suggested that advocacy program covering an important topic on threat factors and waste management is vital for conservation of wbh. In response to that, environmental education workshop was conducted in College of Natural Resources on 11th March, 2018 during which issues such as waste management, environment, and threats and conservation of WBH were addressed. The program participants included students of Dashiding HSS, Ugyen Academy, Bajothang HSS and participants from the college.



Conclusion

The study found out those recreational and social activities sites coincide with common habitat site of wbh. Negative impact of river rafting, fishing, camping, and social activities on wbh was confirmed through physical observation and questionnaire survey. For the survey, various stakeholders (foresters, rafting owners, DEO, Planning officer, academicians, farmers and students) who have knowledge on WBH were involved.

Rafting parameter indicate that through public encroachment, high intensity paddling and foraging coincidence, rafting is disturbing the wbh and its habitat. Therefore, if relevant stakeholders (TCB, RSPN and Rafting owners) can reduce rafting frequency and setup fixed timing for rafting which will not coincide with foraging time of wbh, the impacts of the human-interactions on the wbh would be significantly reduced.

Camping in common area of wbh, despite prohibition, is still commonly occurring, which disturbs wbh and the habitat. To sensitize and caution the visitors from making unauthorized encroachment in the area, Dzongkhag Administration, local authorities, and foresters need to establish signboards and notices in and around the wbh habitat. Since the wbh feeds on fish, the illegal fishing activities in the area can be a threat to the wbh. Therefore, fishing parameter should be taken seriously through penalties and monitoring. Firewood collection from river side was found to take more than month using chainsaw with frequent movement of large number of people. For that parameter, if RSPN, DEO, local people_ and foresters can fix a shorter time period in winter to minimize the impact.

Recommendation

The recommendations from this study is that the Dzongkhag foresters and officials deployed to the area by RSPN should conduct regular monitoring of fishing, camping, and public involvement in all the significant sites of wbh. This will provide opportunity to promote wbh habitat and conserve the species. To reduce impact due to river rafting, setting up of alternative area for rafting will have significant benefit for wbh conservation. Or if not the respective stakeholder should fix a regular timing for rafting (10am to 3pm) and brief the rafters about wbh and common site to mitigate impacts.

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