



Report

White-bellied Heron

Annual population survey, 2020

March 15, 2020

Royal Society for Protection of Nature



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Summary

A total of 27 White-bellied Herons (WBH) were recorded during the 18th annual population survey, which was conducted from 27 February – 02 March 2020. The survey confirmed 24 adults and three sub-adult individuals, which is two more than the previous year. The first WBH population survey was conducted in 2003, and it has been an annual event of the Royal Society for Protection of Nature's (RSPN) WBH Recovery Program since then. The survey covered all currently known and expected habitats along Punatsangchhu, Mangdechuu and Kurigongri basins. Habitats across Bhutan were divided into 41 priority zones and surveyors were deployed to look for the WBH from 6:00 AM to 6:00 PM across five consecutive days within their designated zone. A total of 63 surveyors from the RSPN, Department of Forests and Park Services (DoFPS) and Local Conservation Support Groups (LCSG) were engaged in the survey. For every bird sighted during the survey, observer, date, time, GPS location, count, age and activity were recorded to avoid double counting. All the data were recorded using the Epicollect5 mobile App and uploaded to the central WBH database and analyzed. Two live nests with three eggs each were also located in Punatsangchhu and Mangdechhu basins during the survey.

Introduction

The White-bellied Heron (*Ardea insignis*) is a large heron species of the family Ardeidae, order Pelecaniformes, found in freshwater ecosystems of the Himalayas. It is categorized as critically endangered under the IUCN Red List of threatened species, and the 94th species of the Top 100 EDGE Birds on EDGE of Existence list. It was listed as threatened in 1988, uplisted to endangered in 1994, and has been listed as critically endangered since 2007. In Bhutan, it is listed under Schedule I of FNCR 2017.

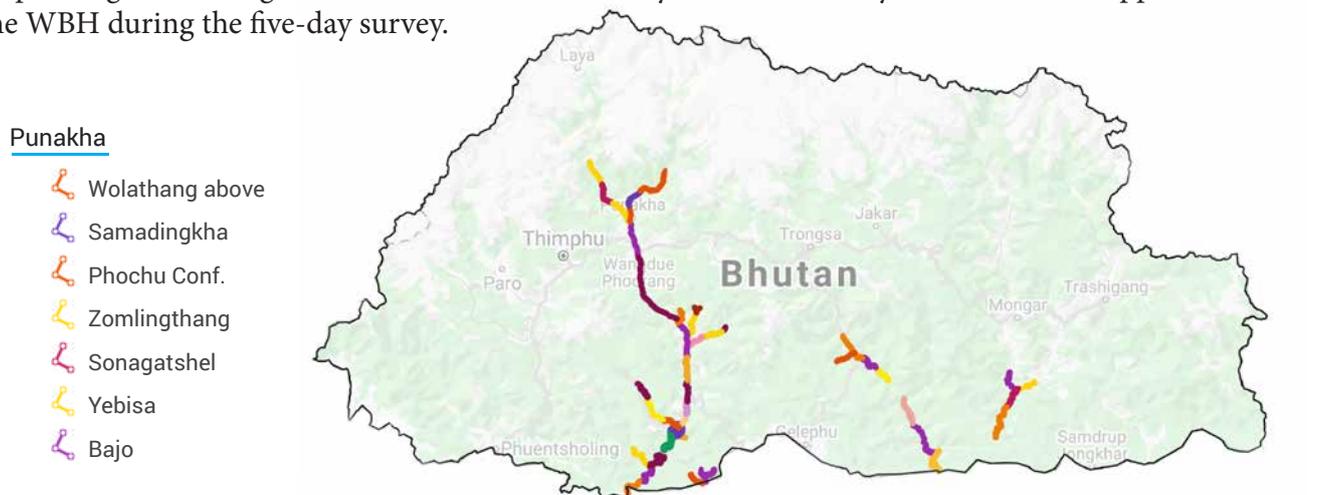
The restriction of WBH to undisturbed freshwater river systems, and its piscivorous feeding behaviour, can be linked to the health of our ecosystems and environment. It is a valuable environmental indicator in this context.

The extremely low and shrinking population of WBH across the region can be attributed to human exploitation and disturbances in riverine habitat, and Bhutan is no exception. Both human-induced and natural disturbances may lead to the extinction of this highly vulnerable bird if timely conservation interventions are not taken.

Given this foreseeable risk, RSPN, in collaboration with relevant agencies and stakeholders, has been working on recovering the population through research and surveys of residents, nests, feeding habitats, distribution, movement, habitat needs, and associated threats for the past 18 years. Since the inception of WBH conservation projects at RSPN, a comprehensive population survey has been an essential annual event. It is a measure of the effectiveness of our efforts and serves as a data baseline for further conservation interventions.

Methods

A preliminary survey was conducted from 1 – 21 December 2019 to identify priority habitats and train surveyors to conduct the annual population survey. The WBHs habitat in Bhutan was divided into 41 priority zones, based on past occurrence records and habitat suitability according to findings of the past inventories. Depending on the length of the zone and accessibility, a trained surveyor or team were appointed to look for the WBH during the five-day survey.



Map 1: White-bellied Heron priority habitat zones

Wangdue

- Wangdue-Kamichhu
- Kamichhu-Zawa
- Zawachhu-Wakletar
- Harachhu -1
- Harachhu-2
- Harachhu -Dayul
- Adha
- Nangzhina_Kisonachhu

Tsirang

- Wakletar-Burichhu
- Changchey
- Sunkosh
- Toedsang
- Balwani
- Kalikhola_Balwani

Dagachhu

- Above Daga Dam
- Dagachhu 2
- Dagachhu Conf.
- Lamoizingkha I
- Karmaling
- Rangaetar
- Sama Davan above
- Samachhu
- Phibsoo Khola
- Longa Khola

Mangdechhu

- Bertichhu
- Mangdechhu Above Tingtibi
- Mangdechhu Below Tingtibi
- Tsaidang area
- Chamkharchhu Pangtang
- Manas
- Pangbang

Kuri-Gongri Basin

- Below Yangbari
- Yangbari-Kurichhu
- Kurichhu
- Drangmechhu

From 27 February – 2 March, surveyors were deployed in pre-designated zones to monitor WBH, ideally from 6:00 am to 6:00 pm. A data collection template was developed on Epicollect5 platform (Refer Annexure 1 for details) and shared with surveyors. All data were collected using Epicollect5 Mobile App, which works offline. Each surveyor was asked to report Date; Time and GPS location, when they “Start Survey” in the morning, “End Survey” in the evening and “Report my Location” every two hours to indicate

their position and area covered during the day. Whenever the WBH was sighted, surveyors immediately recorded the observation with Date, Time, GPS, location, Count, Age, Activity and Remarks, along with a photograph of sighted bird or the survey site. All data were collected offline and uploaded to the central database when an Internet connection was available. In addition, surveyors communicated via telephone whenever WBHs were sighted to ensure effective monitoring and to avoid double counting. All observations and recordings started from 6:00 am 27 February and closed at 6:00 pm, 2 March 2020.

Data Analysis

A total of 968 entries were uploaded to the central database on completion of the survey, of which only 9.5% (92 entries) were of “WBH sighting” and the rest were start survey, end survey, and locations reported by the surveyors. Final data collected were downloaded, reviewed, and analyzed in MS Excel Spreadsheet and subsequently mapped using QGIS Desktop 3.12.0.

First, the entries were segregated into “WBH sighted” and others. WBH sighting entries were used to calculate the population size and other entries (start survey, end survey, report my location) were used to map the surveyed area. All entries were extrapolated using QGIS to visualize the survey area coverage (Map 2).

Results

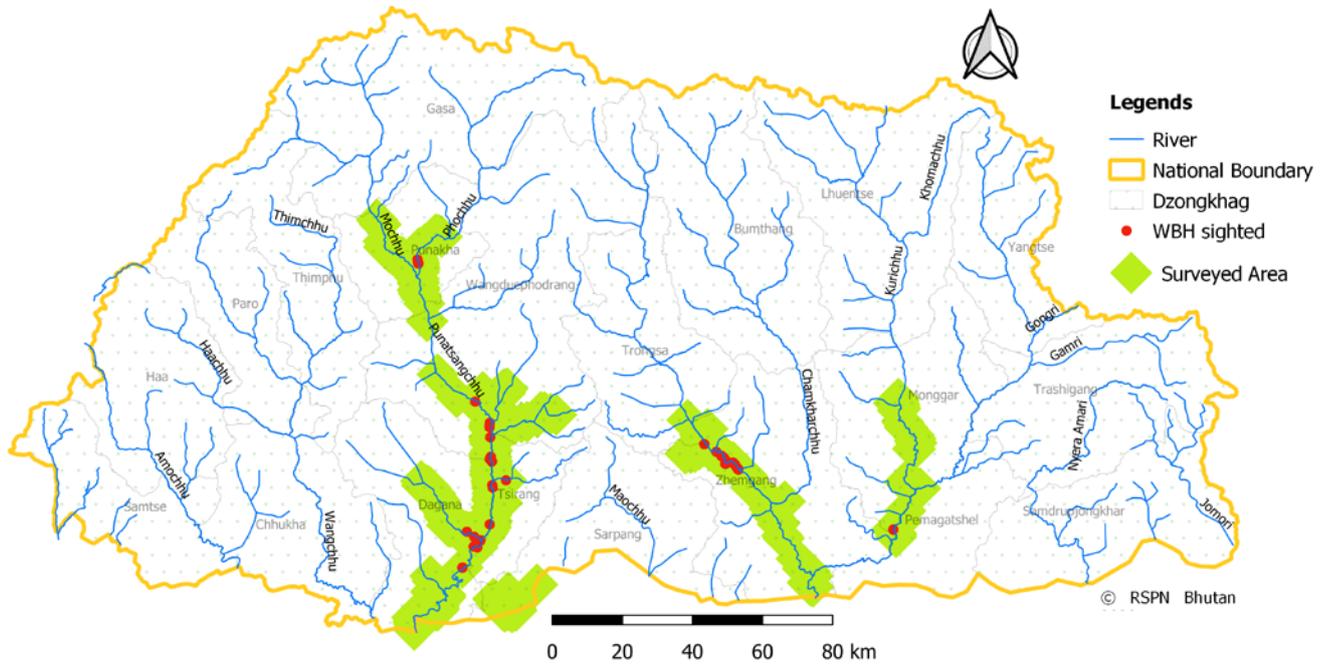
The annual population survey effectively covered all currently occupied and potential habitats of the WBH, along three river basins: Punatsangchhu, Mangdechhu and Kurigongri in Bhutan. The entire stretch of river habitats were divided into 41 priority zones, spanning more than 400 kilometers. During the five-day survey, 280 kilometers of Punatsangchhu, 80 kilometers of Mangdechhu, and 40 kilometers of Kurigongri and their tributaries were surveyed by 63 surveyors. A total of 27 individual WBHs were sighted in 15 of 41 priority zones (Map 2). Two active nests, one in Punatsangchhu and other in Mangdechhu basin were also located during the survey.

92 WBH sighting entries received were further analyzed to remove double counting of the same individual and repeated entries by different observer. Duplications were determined based on details collected, such as observer, date, time, location, count, age, activity and remarks. After potential double count entries were removed, observations were segregated by location and date (survey days) to determine repeated observation of the same individual by the same observer or different observers. Next, the highest number of individuals sighted on any of the five days was taken as the population of each locale. The total population of Bhutan for 2020 was taken as a sum of the population of all 15 locales.

(complete data can be accessed at RSPN server, \\server\USERS\Indra P\Population_2020).

Location	Counts
Dagachhu	2
Goling	2
Kamechhu	1
Phochhu	2
Gewachhu	3
Toesang	1
Tsaidang	5
Mithuntar	2
Burichhu	2
Sunkosh	1
Yangbari	1
Balwani	2
Berti	1
Rangae Khola	2

Table 1: Number of White-bellied Herons sighted during annual population survey 2020.



Map 2: White-bellied Heron annual population survey area coverage (green) and sighting locations (red)

Based on the records, 24 were confirmed as adults, and three subadults. However, as it is challenging to differentiate adults and sub-adults morphologically, only a few trained surveyors could successfully recognize them. All others were reported as adults. Of the 15 sites, where herons were recorded this year, 11 fall under Punatsangchhu basin, 2 under Mangdechhu basin, and 1 under Kurigongri basin. Similarly, 70.4% (19 birds) of the birds were found in the Punatsangchhu basin, 25.9% (7 birds) in Mangdechhu basin and 3.7% (1 bird) in Kurigongri

basin.

For the first time, we were also able to survey Rangae Khola, lower basin of Punatsangchhu; between Kalikhola and Balwani, where we found 2 individuals. Overall, there is an increase in population by 2 from the previous year. However, no herons were sighted this year in places like Phibsoo Wildlife Sanctuary, Lamoyzhingka, Hararongchhu which were critical sites for several years in the past (Refer Annexure 2 for details).

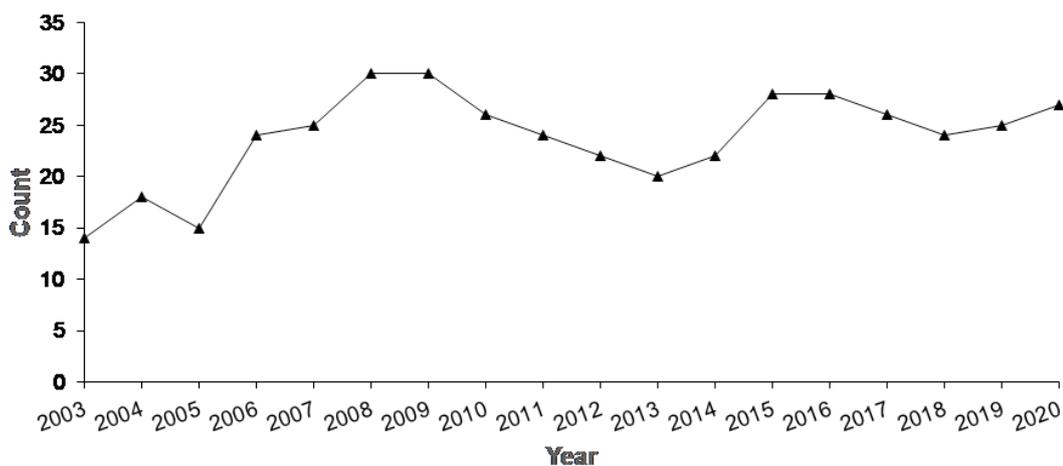


Figure 2: White-bellied Heron population trend in Bhutan, 2003-2020

Notably, there is a significant change in local population demographics in key foraging habitats. The population in older habitats; Phochu, Mochhu, Punakha, Zawa, Kamechhu, Adha, and Nangzhina has drastically declined over the surveyed years. The Phochhu and Mochhu areas had eight birds during 2007 and 2008, but there is hardly one bird visiting the area presently.

Similarly, no birds were seen after 2013 in Zawa and the Kamechhu area, the oldest nesting site, where 6–8 birds were found before 2008. Overall, population trends are decreasing in Adha, Nangzhina, and proximate areas, which were historically preferred

feeding and nesting habitats until 2010. The population in Berti was highest in 2009. While no birds were seen during the 2010 census, the population in the lower basin of Mangdechhu is increasing, particularly in Goling and Tsaidang.

In contrast to these declining areas, in recent years, more individuals have been sighted in lower regions of Punatsangchhu and Mangdechhu basins, which are also newly discovered sites. Mithuntar, Dagachhu catchment, Balwani, in lower basin of Punatsangchhu and Tsaidang in lower basin Mangdechhu are the most promising sites with both population trends and nesting sites in a sharp increase.

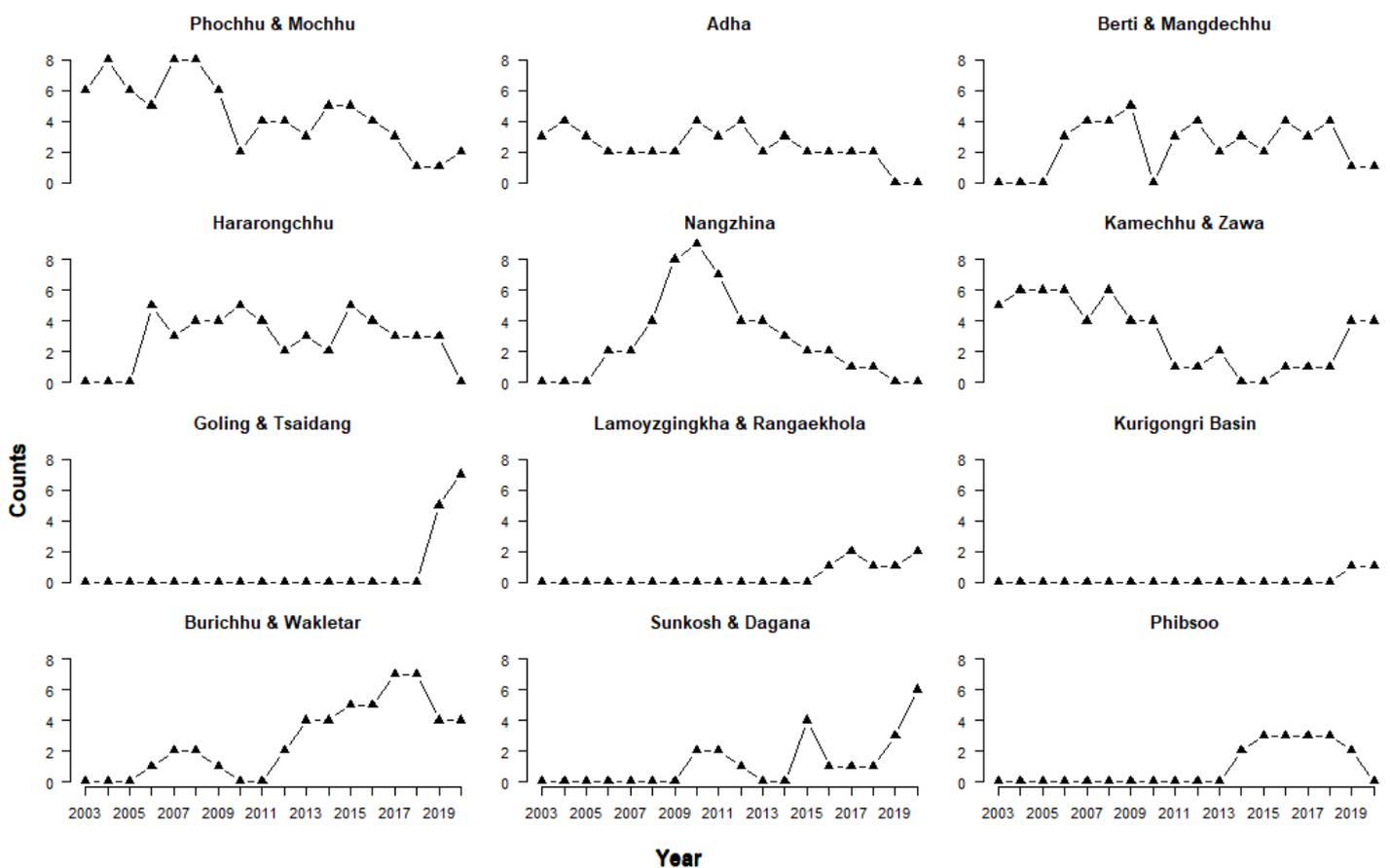


Figure 3: White-bellied Heron population trend in priority zones in Bhutan, 2003 – 2020

Conclusion

Every year RSPN conducts total population count for WBH to have a most accurate and updated data on population size of the bird in Bhutan. It is an extensive process, both financially and in terms of time taken, but it gives us the most reliable estimate of the population. Population size reflects the combined outcome of three demographic processes: reproduction, survival, and movement. A precise population estimates are important to establish and to appraise conservation management practices, particularly for critically endangered and rare species like the WBH.

It is gratifying that the population size this year has increased by 2 numbers, but overall the size is still extremely low and ecologically not at equilibrium. Although significant number of nestlings were produced annually, there is no net recruitment to the existing population. For example, 25 birds were counted in 2019 and 5 nestlings fledged in mid-2019. Although 1 died, 29 birds were expected to be surviving in wilds, however, we could only sight 27 this year. Therefore, the population is still decreasing on an average.

Moreover, our survey approach fundamentally assumes that WBH are not flying a long distance from one locale to other at night. Looking at the daily consecutive counts, it is lesser than the total count. Not all individuals were sighted on a single day. Therefore, it is likely that we might have unavoidably double counted some individuals or might have missed some, as all habitats are not accessible.

Even keeping the flexibility of $\pm 10\%$ due to our survey errors, the population still remains under 30 and this undoubtedly warrants aggressive long-term conservation efforts to save the bird from extinction. Further, RSPN intends to improve the survey methods and extend the surveyed areas as it is suspected that WBH could be found in the erstwhile unexplored areas (as sightings are reported from new areas). This would require soliciting long time collaboration with partners, financial commitment, and use of latest technologies.

This survey was conducted as a part of WBH recovery program, a project funded by Bhutan Trust Fund for Environmental Conservation and fund raised through GoFundMe, initiated by Mr. David Hecht. RSPN remains grateful to DoFPS, LCSGs, surveyors and all partners involved in this survey and look forward to their continued support.

Conservation Partners

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Mrs. Dinh Thi Hoa

Ms. Pamela Isdell



Annexure 1

WBH Population 2020

Population 2020

Observer

Date

Time

GPS Location

Purpose

- Start Survey
- Report my Location
- End Survey
- WBH Sighted

Count

Adult/Juvenile

- Adult
- Juvenile
- Not Sure

Activity

- Feeding
- Flying
- Resting/Roosting/Basking
- Others

Any Remarks

Photo

WHITE-BELLIED HERON POPULATION CENSUS, 2003 - 2020

Annexure 2

Location	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Ada	3	4	3	2	2	2	2	4	3	4	2	3	2	2	2	2	0	0
Dagachu	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
Kamechu	3	2	2	2	2	4	3	2	1	1	0	0	0	1	1	1	0	1
Mochu	0	3	1	1	1	2	1	0	0	0	0	1	1	0	0	0	0	0
Nangzhina	0	0	0	2	2	4	7	6	5	4	4	3	2	2	1	1	0	0
Punakha	4	2	2	2	2	3	3	1	1	0	0	0	0	0	0	0	0	0
Zawa	2	4	4	4	2	2	1	2	0	0	2	0	0	0	0	0	0	0
Doksum	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Yangbari	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Kisonachhu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Rangae Khola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Berti	0	0	0	3	4	4	5	0	3	4	2	3	2	4	3	4	1	1
Phochu	2	3	3	2	5	3	2	1	3	4	3	4	4	4	3	1	1	2
Lamoyzhingkha	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	0
Goling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
Kurichhu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Burichu	0	0	0	1	2	2	1	0	0	2	4	2	3	3	5	5	2	2
Phipsoo	0	0	0	0	0	0	0	0	0	0	0	2	3	3	3	3	2	0
Sunkoshgoan	0	0	0	0	0	0	0	2	2	1	0	0	2	1	1	1	1	1
Walkleytar	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2
Toedsang Balwanie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3
Hararongchu	0	0	0	5	3	4	4	5	4	2	3	2	5	4	3	3	3	0
Gewaronchu	0	0	0	0	0	0	1	3	2	0	0	0	0	0	0	0	4	0
Tshaidang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5
Total No.	14	18	15	24	25	30	30	26	24	22	20	22	28	28	26	24	25	27