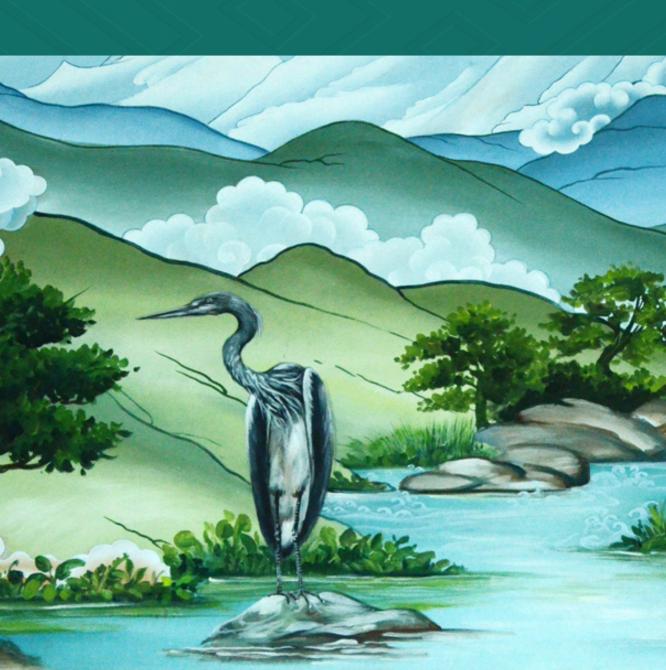


# Report

White-bellied Heron Ardea insignis

**Annual Population Survey 2023** 





#### Summary

A total of 27 White-bellied Herons (WBH), including three juveniles were recorded during the Annual Nationwide Population Count, conducted from 01 - 05 March 2023. The survey was conducted across the major river basins; Punatsangchu, Mangdechu, Chamkharchu, Kurichu, Kholongchu, Drangmechu, Manas, Wangchu, and major tributaries, covering all currently used and potential WBH habitats. The river basins were divided into 18 zones and 74 survey sites for the annual count. More than a hundred surveyors were engaged from the Department of Forests and Park Services (DoFPS), Local Conservation Support Groups (LCSG), and Royal Society for Protection of Nature (RSPN) to conduct the survey for five consecutive days from 7:00 AM - 5:00 PM within their designated area. For every WBH sighted during the survey, details of the observer, date, time, GPS location, count, age, activity, and weather were recorded. In addition, all wildlife species sighted during the survey were also enumerated for record and to study the diversity and population trend of associated species within the area. The survey was conducted using Epicollect5 digital data collection platform. Data was recorded and uploaded to the central database, and later analyzed. Two active nests were also located during the survey. Of the 24 individuals of WBH recorded in the wild, 67% were found in the Punatsangchu basin, 16.5% were in the Mangdechu basin, and 16.5% were in Wangchu basin. Four herons were sighted in Wangchu basin (Wangchu and Piping rivers) this year. During the survey, no herons were sighted in the Chamkharchu, lower Mangdechu, Manas, and Kurigongri basins. A total of 271 birds and 23 mammal species were recorded during the survey.

The first WBH population survey was conducted in 2003 and has been an annual event since then. RSPN also started the ex-situ conservation breeding of WBH in 2021 to secure the gene pool and expedite population recovery. Today, the conservation of WBH is not only a flagship program but also at the forefront of RSPN's core mandate.

## Introduction/background

The WBH is one of the most threatened bird species, with only a small and fragmented population size remaining in Bhutan, Northeast India, and Northern Myanmar. Researchers have recorded fewer than six individuals in Northeast India, 14 - 30 individuals in Bhutan (2003 - 2022 population survey), and a small population is expected to persist in Myanmar. Since 2008, the species has been uplifted to Critically Endangered because of its extremely small and rapidly declining population. This decline is projected to increase in the near future as a result of the loss and degradation of lowland forests and wetlands and through direct exploitation and disturbance of the habitats. Further, the small size breeding population, restricted habitat range, increasing threats in their distribution range, and climate change impacts have contributed to the further decline of the species. The conservation efforts by the RSPN in partnership with relevant stakeholders helped understand the distribution, population trend, and behavior. The conservation works were initiated by documenting the biological behavior of the species, habitat monitoring, and restoration of degraded habitats in 2003. Besides various in-situ conservation initiatives, the conservation breeding program was resorted due to the urgent need to revive the critically low population. It was initiated in 2021 after the successful piloting of artificial incubation and hand rearing in 2011. The collaborative conservation programs improved the livelihood of the local communities residing along the WBH landscape. Many of the threat mitigation works for WBH were implemented on community-based approaches to benefit both the local communities and the WBH. To strengthen the conservation works, RSPN was able to mobilize and establish a strong network among stakeholders within and outside the country to save the species collaboratively. Today, this LCSG established in the communities of WBH landscape contribute towards monitoring of herons and also advocates conservation messages.

This WBH Annual Population Survey is RSPN's population monitoring tool started in 2003 and is conducted during the beginning of the breeding season (End of February - first week of March). During the survey, more than 100 surveyors search for herons within their designated site for five days. They also document any additional wildlife species they see while conducting the survey. An app called Epicollect5 was used to gather and and distribute data. The information on associated species presence in the WBH habitat provides an understanding of the overall biodiversity in the WBH landscape and has added value to conserve herons through holistic means.

Understanding the heron's population trend and dispersion relies heavily on the annual population survey. Population surveys and monitoring data are also used to select immediate threat mitigation measures and outline conservation programs. The information can be used to create a conservation action plan. The ten-year conservation action plan for WBH was launched in 2022 to enhance further and streamline the effort to save the species.

## Survey method

The WBH habitats in Bhutan, which include potential and currently occupied areas by herons are divided into 18 zones. Zones are arbitrary divisions of riverscapes in Bhutan only to monitor and report the heron population. The altitude of the habitat ranges from 150 m asl in the south to the highest of 1800 masl in the north. Zones are further divided into 74 survey sites - transects for the annual count and population monitoring. These zones are systematically surveyed during the annual population count. For this survey, 14 out of 18 zones were surveyed, and four zones with no past observations and indirect evidence of its occurrence were omitted.

During the survey, surveyors repeatedly scan for herons along the transect within the designated site for five consecutive days. Some surveyors were stationed at a fixed point, either at a confluence of a river, a regularly used flight route, a nest site, or a place where heron frequently visits for foraging. Surveyors take a vantage point to observe and count herons. Surveyors regularly contact each other, especially in adjacent sites, to avoid double counting and repetitive recording of the same individuals.

As herons are most active during morning and evening, the survey on each day begins early morning and ends late evening. To avoid the double counting of the WBH, the sightings made in each transect by surveyors are communicated to other surveyors. Similarly, during the analysis and finalization of the final count, the time, place of sighting, and activity were reviewed and screened to avoid duplication.

Data was collected using the Epicollect5 mobile app. The project 'White-bellied Heron Population Survey' was created and made accessible to all the surveyors prior to the survey. The surveyors are familiarized with the usage of the app and data entry. During the survey, each surveyor is required to enter observations, including the starting and ending survey to map the area surveyed during the day. All the observations of WBH, other wildlife and threats are recorded with the observer's detail, geo-coordinates, time, weather and frequency. Any other wildlife species that could not be identified are consulted with the experts through a social forum maintained in the Telegram group, thus helping in gathering an accurate list of species observed. The species list submitted is further reviewed during the data cleaning and analysis after the conduct of the survey. The individual surveyor is consulted for the doubtful or rare species list submitted.

## **Data analysis**

The data collected were uploaded to a common database by the surveyors whenever they had access to the internet. The project created in Epicollect5 was closed for the surveyors after the survey period and all the data collected were downloaded as CSV file format by the project Admin. Later, the data was then sorted into four categories; WBH observed, Other wildlife observed, Start survey and End survey and Location update and threats.

The WBH observation data were used to determine the WBH population count and the observation data was grouped based on zones and dates to determine the WBH individuals numbers present in the area. To avoid the double counting or repeated entry of the same individuals by different surveyors, the observation time, date, GPS location, age and observational remarks were taken into account. For the final count in each zone, the highest number of individuals sighted in any of the five survey days were taken and the sum of all the individuals sighted in each zone was taken as the final WBH count for the country. The GPS locations of surveyed areas and species observed were used to map the distribution range and area surveyed.

Similarly, for other wildlife species, all incomplete entries with missing coordinates, and doubtful species that are less likely to occur in the survey area during the particular period were removed. To determine species richness, individual count and threats present, the observational data were segregated into zones and summed up. A final species checklist for both birds and mammals was prepared with individual counts.

Data cleaning and analysis were done in Microsoft Excel, WBH population trend analysis over the year was done in R and WBH, zone and distribution mapping was done using ArcGis.





#### **Results**

A total of 7935 data entries were made by the surveyors during the five-day survey and covered about 565 km of river stretch. From this, two percent of data entries were made for actual WBH sightings (144), 69 percent of the entries (5493) were made for other wildlife sightings that are of Birds and Mammal species, and the remaining 29 percent (2298) entries were start survey, update location and end survey. The data were segregated by zones and later consolidated to get the total number of WBH recorded in the entire WBH landscape or in Bhutan. Similar for other wildlife analyses were made for the other wildlife and threats observed. Details of the sighting location and area covered during the survey are illustrated in the map below (Figure 1).

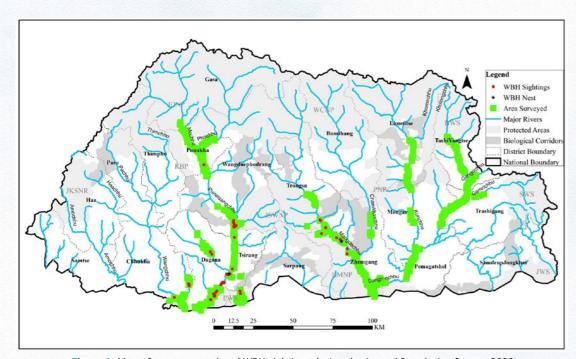


Figure 1: Map of area surveyed and WBH sightings during the Annual Population Survey, 2023

This year, a total of 27 WBH were recorded in Bhutan, including 24 individuals observed in the wild and 3 individuals in the WBH conservation center. The major river basins from which the WBH recorded includes Punatsangchu, Mangdechu and Wangchu. The highest number of WBH individuals was recorded from Punatsangchu (58%, n=14) followed by Mangdechu and Wangchu (18% n=4) and the least in Phibsoo Wildlife Sanctuary (8% n=2) (Figure 4.d). Compared to the previous year (2022), there is an increase in count in the Punatsangchu and Wangchu basins. An increase of two individuals was observed in Punatsangchu and three in the Wangchu basin. However, there is a 50 percent drop in the number of WBH recorded from Mangdechu. In 2022, the Mangdechu basin recorded eight WBH individuals. The decline was mainly observed from the lower Mangdechu basin. Overall the population trend analysis shows that Bhutan has a slightly increasing trend in the WBH population (Figure 2).

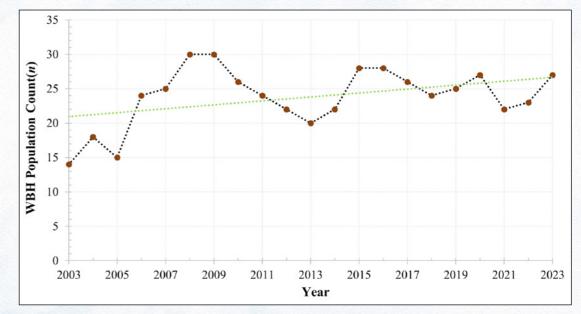


Figure 2: WBH population trend in Bhutan (2003-2023)

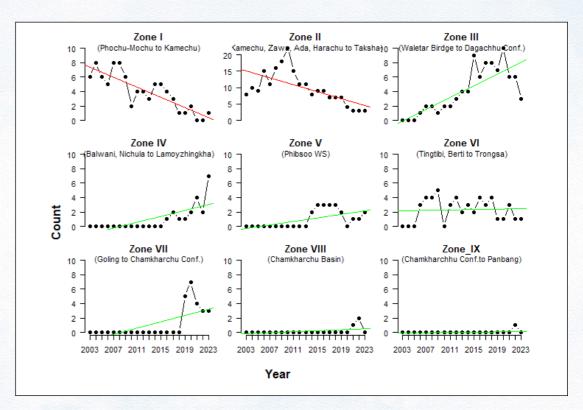


Figure 3: Graph showing WBH sighting detail

	WBH Habitat Zones	Places	Count
	Zone - I	Phochhu	1
	Zone - II	Adha, Nagzhina, Hararongchhu, Kisonachhu and Taksha area	3
In-situ	Zone - III	Burichhu, Sunkosh-Dagachhu, Relangthang, Wakletar, Balwani,Malbasey, Kalikhola and Middle Punatsangchhu area	6
iii Sita	Zone - IV	Lamozingkha, Rangae and Gumti Lower Punatsangchhu area	4
	Zone - V	Phibsoo Wildlife Sanctuary	2
	Zone - VI	Berti and Upper Mangdechhu area	1
	Zone - VII	Goling and Tsaidang area	3
	Zone - XV	Jigmechhu and Wangchhu area	4
Ex-situ	WBH Conserva	tion Center	3
		Total Count	27

**Table 1:** WBH count from different zones as sighted during the population survey, 2023

In terms of zone wise, 14 WBH zones were surveyed of which WBH sightings were recorded only from eight zones (Zone I, II, III, IV, V, VI, VII and XV) as shown in Table 1 and no sightings were recorded from six zones (Zone VIII, IX, X, XI, XII, XIII & XIV). The highest number of herons were recorded in zone III (n= 6) and the least was sighted in Zone I (n=1). After three years of gap in Zone I, a lone heron was sighted this year. In Zone IV, there is an increase of two individuals compared to the previous year. The total number of individuals sighted in Zone VI and VII remains the same as the previous year, with one and three individuals respectively. However, no herons were sighted in Zone VIII and X this year, although two herons each were found during the last survey. In Zone XV, four individuals were recorded this year, three herons compared to the previous year's count. The population trend analysis in each zone shows that Zone III, IV, V, VI, VII, VIII, IX, X and XV shows an increasing trend (Greenline), Zone I, II, XI, XII, XIII and XIV shows decreasing trend (Redline) and No trend was observed in Zone XVI, XVII and XVIII (Blueline) as no WBH was recorded from this zones (Figure 5).



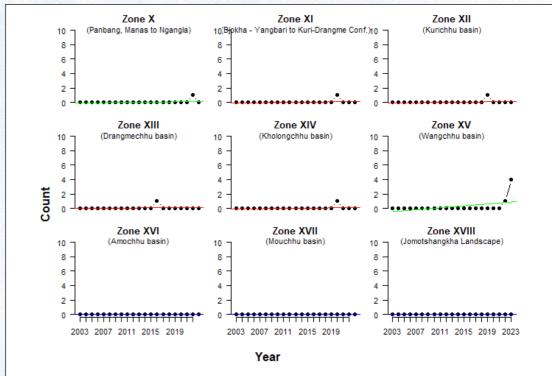


Figure 4: WBH population trend in different habitats zones since 2003

The three individuals included for the total WBH population accounted for this year are from the WBH Conservation Center (WBHCC). There were two individuals last year, but an injured juvenile was rescued and brought to the center on 1st September, 2022. In terms of casualty reports of WBH, in November 2022, a carcass of an adult heron was found in the Punatsangchu basin (near Serutar village in Tsirang).

The survey also documented active WBH nests (Figure 1). Unlike other species of heron that breed in colonies, WBH breeds in solitary. During the survey, two active nests were recorded, one each in Mangdechu and Punatsangchu basins. Since 2003, there is a record of WBH breeding in Bhutan annually with records of two-five active nests.



## Wildlife diversity in WBH landscape

The other wildlife observed during the survey were mostly mammals and birds. During this survey, 5493 entries for other wildlife observations were recorded of which 4782 were birds, 374 were mammal species and 337 entries were made without GPS coordinates and suspicious species and it was excluded from the analysis.

A total of 271 bird species were observed during the survey along the WBH landscape. The globally threatened species observed includes Steppe Eagle (Endangered), Pallas's Fish Eagle (Endangered) and three hornbill species, Wreathed Hornbill, Rufous-necked Hornbill and Great Hornbill that are listed as Vulnerable category according to Birdlife International (2023). The migratory waterbirds observed were mostly birds belonging to Anatidae (ducks), Ardeidae (herons), Scolopacidae (sandpipers) and Grudae (cranes) family. For mammals, 23 species were recorded and the Assamese macaque was the most common species observed in WBH landscape. The other primate species observed include Arunachal Macaque, Golden Langur, Grey Langur and Capped Langur. The globally threatened mammalian species, such as the endangered Asian Elephant and Water buffalo, and vulnerable Asian-small Clawed Otter, Smooth-coated Otter and Sambar deer were also sighted.

Among Zones, the highest number of Bird species was recorded in Zone I (S=141) followed by Zone III (S=102) and the least was recorded in Zone IX (S=12). Similarly, for mammals, highest was recorded in Zone III and VIII (S=10) and lowest in Zone V (S=2) (Figure 6).

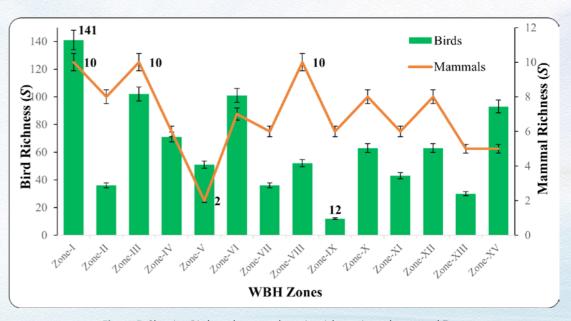
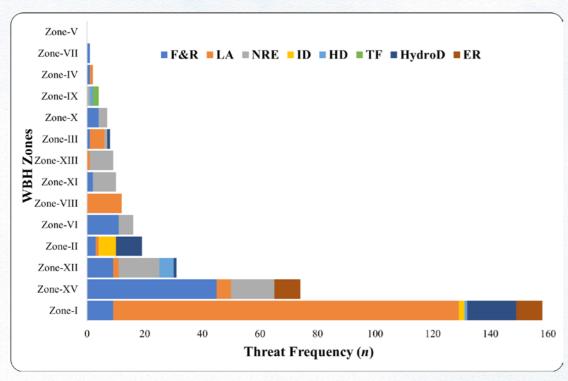


Figure 5: Showing Birds and mammal species richness in each surveyed Zones

#### Threats to WBH and other wildlife

The threats observed along the WBH landscape were recorded during the survey. These recorded threats were later classified into different categories as threats from fishing and Related activities (F&R), Local activities (LA), Natural resources extraction (NRE), Infrastructure development (ID), habitat degradation (HD), hydropower development (HydroD), ecotourism and recreational activities (ER) and Timber and Firewood (TF). On the basis of threats analysis, Zone I has recorded the highest frequency of the threats (n= 158) that constitute maximum threats from local activities followed by Zone XV (n=74), and a fewer number of threats were observed in Zone IV and VII. No threats were recorded from zone V (Phibsoo Wildlife Sanctuary) (Figure 7).

WBH is sensitive to the threats and disturbances in the riverine ecosystem. Threats such as illegal fishing, natural resources extraction, forest fire, and civil infrastructure development along the river disturbs the foraging habitat and nesting ecology of the WBH. In the past, there are also records of electrocution and collision of WBH on electric transmission lines that are laid along their habitats. Some of the natural predators of WBH are monkeys and small mammals.



**Figure 6:** Showing threat frequency in each zone with different threat categories

## **Acknowledgements**

RSPN would like to express our gratitude to the Federal Ministry of Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV), Germany through International Climate Initiative (IKI) for supporting our WBH. The population and nest surveys of WBH are part of the 'Developing Ecosystem-based Solutions for Managing Biodiversity Landscapes in Bhutan' project. We appreciate the unwavering support and direction given to our conservation efforts by Synchronicity Earth, MAVA Foundation, International Crane Foundation, Alice C Tylor Perpetual Trust, Global Wildlife Conservation, Punatsangchu Hydroelectric Project Authority I & II, DoFPS, and to all our donors, partners and philanthropists.

We appreciate the support and hard work of all surveyors from DoFPS, LCSG and volunteers in making this annual survey a success.



# **Annexure**

# **Bird List:**

SI. No.	Common Names	Scientific Name	Conservation Status	Total Count (n)
1	Abbott's Babbler	Malacocincla abbotti	LC	5
2	Ashy Bulbul	Hemixos flavala	LC	61
3	Ashy Drongo	Dicrurus leucophaeus	LC	19
4	Ashy-throated Warbler	Phylloscopus maculipennis	LC	16
5	Asian Barred Owlet	laucidium cuculoides	LC	6
6	Asian Fairy Bluebird	Irena puella	LC	24
7	Asian House Martin	Delichon dasypus	LC	2
8	Bar-headed Goose	Anser indicus	LC	11
9	Barred Cuckoo Dove	Macropygia unchall	LC	17
10	Bar-throated Siva	Siva strigula	LC	5
11	Bar-winged Flycatcher-shrike	Hemipus picatus	LC	20
12	Bay Woodpecker	Blythipicus pyrrhotis	LC	26
13	Besra	Accipiter virgatus	LC	1
14	Bhutan Laughingthrush	Garrulax imbricatus	LC	66
15	Black Bulbul	Hypsipetes leucocephalus	LC	394
16	Black Drongo	Dicrurus macrocercus	LC	27
17	Black Eagle	lctinaetus malaiensis	LC	6
18	Black Redstart	Phoenicurus ochruros	LC	11
19	Black Stork	Ciconia nigra	LC	8
20	Black-backed Forktail	Enicurus immaculatus	LC	3
21	Black-chinned Yuhina	Yuhina nigrimenta	LC	82
22	Black-crested Bulbul	Hypsipetes leucocephalus	LC	51

SI. No.	Common Names	Scientific Name	Conservation Status	Total Count (n)
23	Black-crowned Night Heron	Nycticorax nycticorax	LC	6
24	Black-eared Kite/Black Kite	Milvus migrans	LC	3
25	Black-faced Warbler	Abroscopus schisticeps	LC	3
26	Black-hooded Oriole	Oriolus xanthornus	LC	2
27	Black-necked Crane	Grus nigricollis	NT	48
28	Black-throated Prinia	Prinia atrogularis	LC	3
29	Black-throated Sunbird	Aethopyga saturata	LC	6
30	Black-throated Tit	Aegithalos concinnus	LC	13
31	Black-winged Kite	Elanus caeruleus	LC	1
32	Blue Rock Thrush	Monticola solitarius	LC	22
33	Blue Whistling Thrush	Myophonus caeruleus	LC	107
34	Blue-bearded Bee-eater	Nyctyornis athertoni	LC	5
35	Blue-capped Redstart	Phoenicurus coeruleocephala	LC	10
36	Blue-capped Rock Thrush	Monticola cinclorhyncha	LC	2
37	Blue-throated Barbet	Megalaima asiatica	LC	43
38	Blue-winged Laughingthrush	Trochalopteron squamatum	LC	1
39	Blue-winged Siva	Siva cyanouroptera	LC	10
40	Blyth's Kingfisher	Alcedo hercules	LC	3
41	Bronzed Drongo	Dicrurus aeneus	LC	8
42	Brown Bush Warbler	Locustella luteoventris	LC	2
43	Brown Dipper	Cinclus pallasii	LC	124
44	Brown Shrike	Lanius cristatus	LC	1
45	Brown-throated Treecreeper/ Sikkim treecreeper	Certhia discolor	LC	1
46	Cattle Egret	Bubulcus ibis	LC	19

SI. No.	Common Names	Scientific Name	Conservation Status	Total Count (n)
47	Chestnut-bellied Nuthatch	Sitta cinnamoventris	LC	20
48	Chestnut-bellied Rock Thrush	Monticola rufiventris	LC	6
49	Chestnut-breasted Partridge	Arborophila mandellii	NT	4
50	Chestnut-crowned Bush Warbler	Cettia major	LC	9
51	Chestnut-crowned Laughingthrush	Trochalopteron erythrocephalum	LC	19
52	Chestnut-headed Tesia	Cettia castaneocoronata	LC	4
53	Collared Falconet	Microhierax caerulescens	LC	6
54	Collared Owlet	Glaucidium brodiei	LC	2
55	Collared Treepie	Dendrocitta frontalis	LC	2
56	Common Buzzard	Buteo buteo	LC	7
57	Common Green Magpie	Cissa chinensis	LC	11
58	Common Greenshank	Tringa nebularia	LC	6
59	Common Hill Myna	Gracula religiosa	LC	39
60	Common Hoopoe	Upupa epops	LC	2
61	Common Iora	Aegithina tiphia	LC	1
62	Common Kestrel	Falco tinnunculus	LC	8
63	Common Kingfisher	Alcedo atthis	LC	37
64	Common Pigeon/ Rock Dove	Columba livia	LC	55
65	Common Pochard	Aythya ferina	LC	5
66	Common Redshank	Tringa totanus	LC	2
67	Common Rosefinch	Carpodacus erythrinus	LC	15
68	Common Sandpiper	Actitis hypoleucos	LC	20
69	Common Shelduck	Tadorna tadorna	LC	4
70	Common Stonechat	Saxicola maurus	LC	2

SI. No.	Common Names	Scientific Name	Conservation Status	Total Count (n)
71	Common Tailorbird	Orthotomus sutorius	LC	6
72	Common Teal	Anas crecca	LC	107
73	Crested Goshawk	Accipiter trivirgatus	LC	1
74	Crested Kingfisher	Megaceryle lugubris	LC	84
75	Crested Serpent Eagle	Spilornis cheela	LC	21
76	Crimson Sunbird	Aethopyga siparaja	LC	9
77	Crimson-breasted Woodpecker	Dryobates pernyii	LC	5
78	Dark-sided Flycatcher	Muscicapa sibirica	LC	1
79	Emerald Dove	Chalcophaps indica	LC	1
80	Eurasian Jay	Garrulus glandarius	LC	3
81	Eurasian Tree Sparrow	Passer montanus	LC	18
82	Eurasian Wigeon	Mareca penelope	LC	28
83	Eurasian Wren	Troglodytes troglodytes	LC	2
84	Ferruginous Duck	Aythya nyroca	NT	19
85	Fire-breasted Flowerpecker	Dicaeum erythrothorax	LC	13
86	Fork-tailed Swift/Pacific Swift	Apus pacificus	LC	3
87	Fulvous-breasted Woodpecker	Dendrocopos macei	LC	2
88	Gadwall	Mareca strepera	LC	7
89	Garganey	Spatula querquedula	LC	1
90	Golden Bush Robin	Tarsiger chrysaeus	LC	3
91	Golden-fronted Leafbird	Chloropsis aurifrons	LC	9
92	Golden-throated Barbet	Psilopogon franklinii	LC	3
93	Goosander/Merganser	Mergus merganser	LC	100
94	Great Barbet	Psilopogon virens	LC	73
95	Great Cormorant	Phalacrocorax carbo	LC	494

SI. No.	Common Names	Scientific Name	Conservation Status	Total Count (n)
96	Great Egret	Ardea alba	LC	2
97	Great Hornbill	Buceros bicornis	VU	138
98	Great Myna	Acridotheres grandis	LC	13
99	Great-crested Grebe	Podiceps cristatus	LC	6
100	Greater Coucal	Centropus sinensis	LC	1
101	Greater Goldenback/Flameback	Chrysocolaptes guttacristatus	LC	1
102	Greater Necklaced Laughingthrush	Pterorhinus pectoralis	LC	15
103	Greater Racket-tailed Drongo	Dicrurus paradiseus	LC	7
104	Greater Yellownape	Chrysophlegma flavinucha	LC	5
105	Green Imperial Pigeon	Ducula aenea	NT	4
106	Green Sandpiper	Tringa ochropus	LC	3
107	Green-backed Tit	Parus monticolus	LC	37
108	Green-billed Malkoha	Phaenicophaeus tristis	LC	9
109	Greenish Warbler	Phylloscopus trochiloides	LC	5
110	Green-tailed Sunbird	Aethopyga nipalensis	LC	6
111	Grey Bushchat	Saxicola ferreus	LC	3
112	Grey Heron	Ardea cinerea	LC	5
113	Grey Peacock Pheasant	Polyplectron bicalcaratum	LC	1
114	Grey Treepie	Dendrocitta formosae	LC	29
115	Grey Wagtail	Motacilla cinerea	LC	8
116	Grey-backed Shrike	Lanius tephronotus	LC	16
117	Grey-chinned Minivet	Pericrocotus solaris	LC	16
118	Grey-crested Tit	Lophophanes dichrous	LC	11
119	Grey-headed Canary Flycatcher	Culicicapa ceylonensis	LC	4

SI. No.	Common Names	Scientific Name	Conservation Status	Total Count (n)
120	Grey-headed Lapwing	Vanellus cinereus	LC	32
121	Grey-headed Parrotbill	Paradoxornis gularis	LC	4
122	Grey-headed Woodpecker	Picus canus	LC	6
123	Grey-hooded Warbler	Phylloscopus xanthoschistos	LC	12
124	Grey-sided Bush Warbler	Cettia brunnifrons	LC	1
125	Grey-throated Babbler	Stachyris nigriceps	LC	6
126	Grey-winged Blackbird	Turdus boulboul	LC	1
127	Hill Partridge	Arborophila torqueola	LC	3
128	Himalayan Bulbul	Pycnonotus leucogenys	LC	18
129	Himalayan Buzzard	Buteo refectus	LC	1
130	Hoary-throated Barwing	Sibia nipalensis	LC	6
131	Hodgson's Redstart	Phoenicurus hodgsoni	LC	27
132	Hodgson's Treecreeper	Certhia hodgsoni	LC	1
133	House Crow	Corvus splendens	LC	2
134	Hume's Warbler	Phylloscopus humei	LC	3
135	Ibisbill	lbidorhyncha struthersii	LC	8
136	Indian Peafowl	Pavo cristatus	LC	19
137	Indian Pond Heron	Ardeola grayii	LC	20
138	Indian Roller	Coracias benghalensis	LC	11
139	Jungle Babbler	Argya striata	LC	2
140	Jungle Myna	Acridotheres fuscus	LC	18
141	Kalij Pheasant	Lophura leucomelanos	LC	25
142	Large Woodshrike	Tephrodornis virgatus	LC	15
143	Large-billed Crow	Corvus macrorhynchos	LC	37

SI. No.	Common Names	Scientific Name	Conservation Status	Total Count (n)
144	Lesser Necklaced Laughingthrush	Garrulax monileger	LC	17
145	Lesser Racket-tailed Drongo	Dicrurus remifer	LC	3
146	Lesser Shortwing	Brachypteryx leucophris	LC	1
147	Lesser Yellownape	Picus chlorolophus	LC	2
148	Lineated Barbet	Psilopogon lineatus	LC	4
149	Little Bunting	Emberiza pusilla	LC	41
150	Little Cormorant	Microcarbo niger	LC	80
151	Little Egret	Egretta garzetta	LC	46
152	Little Forktail	Enicurus scouleri	LC	52
153	Little Ringed Plover	Charadrius dubius	LC	7
154	Long-tailed Broadbill	Psarisomus dalhousiae	LC	7
155	Long-tailed Minivet	Pericrocotus ethologus	LC	40
156	Long-tailed Shrike	Lanius schach	LC	2
157	Long-tailed Sibia	Heterophasia picaoides	LC	9
158	Long-tailed Thrush	Zoothera dixoni	LC	2
159	Mallard	Anas platyrhynchos	LC	46
160	Maroon Oriole	Oriolus traillii	LC	4
161	Mountain Bulbul	Ixos mcclellandii	LC	29
162	Mountain Hawk Eagle	Nisaetus nipalensis	NT	4
163	Mountain Imperial Pigeon	Ducula badia	LC	2
164	Nepal Fulvetta	Alcippe nipalensis	LC	19
165	Nepal House Martin	Delichon nipalense	LC	25
166	Northern Pintail	Anas acuta	LC	76
167	Olive-backed Pipit	Anthus hodgsoni	LC	31

SI. No.	Common Names	Scientific Name	Conservation Status	Total Count (n)
168	Orange-bellied Leafbird	Chloropsis hardwickii	LC	28
169	Oriental Honey-buzzard	Pernis ptilorhynchus	LC	2
170	Oriental Magpie Robin	Copsychus saularis	LC	27
171	Oriental Pied Hornbill	Anthracoceros albirostris	LC	11
172	Oriental White-eye	Zosterops palpebrosus	LC	56
173	Osprey	Pandion haliaetus	LC	10
174	Paddyfield Pipit	Anthus rufulus	LC	31
175	Pale Blue Flycatcher	Cyornis unicolor	LC	2
176	Pallas's Fish Eagle	Haliaeetus leucoryphus	EN	6
177	Pin-tailed Green Pigeon	Treron apicauda	LC	5
178	Plain-backed Thrush/Alpine Thrush	Zoothera mollissima	LC	1
179	Plumbeous Water-redstart	Phoenicurus fuliginosus	LC	342
180	Pygmy Wren Babbler/ Pygmy Cupwing	Pnoepyga pusilla	LC	3
181	Red Junglefowl	Gallus gallus	LC	19
182	Red-billed Leiothrix	Leiothrix lutea	LC	8
183	Red-breasted Parakeet	Psittacula alexandri	LC	17
184	Red-crested Pochard	Netta rufina	LC	72
185	Red-headed Trogon	Harpactes erthrocephalus	LC	6
186	Red-tailed Minla	Minla ignotincta	LC	22
187	Red-vented Bulbul	Pycnonotus cafer	LC	333
188	Red-wattled Lapwing	Vanellus indicus	LC	16
189	Red-whiskered Bulbul	Pycnonotus jocosus	LC	231
190	River Lapwing	Vanellus duvaucelii	NT	223
191	Rosy Pipit	Anthus roseatus	LC	11

SI. No.	Common Names	Scientific Name	Conservation Status	Total Count (n)
192	Ruddy Shelduck	Tadorna ferruginea	LC	730
193	Rufescent Prinia	Prinia rufescens	LC	3
194	Rufous Sibia	Heterophasia capistrata	LC	90
195	Rufous Treepie	Dendrocitta vagabunda	LC	1
196	Rufous Woodpecker	Micropternus brachyurus	LC	2
197	Rufous-backed Sibia	Leioptila annectens	LC	2
198	Rufous-bellied Eagle	Lophotriorchis kienerii	LC	1
199	Rufous-bellied Niltava	Niltava sundara	LC	1
200	Rufous-breasted Accentor	Prunella strophiata	LC	5
201	Rufous-breasted Bush Robin	Tarsiger hyperythrus	LC	1
202	Rufous-necked Hornbill	Aceros nipalensis	VU	38
203	Rufous-necked Laughingthrush	Pterorhinus ruficollis	LC	13
204	Rufous-throated Partridge	Arborophila rufogularis	LC	2
205	Rufous/Oriental Turtle Dove	Streptopelia orientalis	LC	13
206	Rufous-vented Yuhina	Yuhina occipitalis	LC	7
207	Rufous-winged Fulvetta	Schoeniparus castaneceps	LC	9
208	Russet Sparrow	Passer cinnamomeus	LC	7
209	Rusty-cheeked Scimitar Babbler	Erythrogenys erythrogenys	LC	5
210	Rusty-flanked Treecreeper	Certhia nipalensis	LC	3
211	Savanna Nightjar	Caprimulgus affinis	LC	1
212	Scaly Thrush	Zoothera dauma	LC	5
213	Scaly-breasted Munia	Lonchura punctulata	LC	7
214	Scarlet Finch	Carpodacus sipahi	LC	1
215	Scarlet Minivet	Pericrocotus flammeus	LC	80

SI. No.	Common Names	Scientific Name	Conservation Status	Total Count (n)
216	Silver-eared Mesia	Leiothrix argentauris	LC	69
217	Slaty-backed Flycatcher	Ficedula erithacus	LC	1
218	Slaty-backed Forktail	Enicurus schistaceus	LC	73
219	Small Minivet	Pericrocotus cinnamomeus	LC	2
220	Small Niltava	Niltava macgrigoriae	LC	4
221	Small Pratincole	Glareo lactea	LC	39
222	Snow Pigeon	Columba leuconota	LC	13
223	Spangled Drongo	Dicrurus bracteatus	LC	20
224	Speckled Piculet	Picumnus innominatus	LC	1
225	Spotted Dove	Spilopelia chinensis	LC	32
226	Spotted Forktail	Enicurus maculatus	LC	2
227	Spotted Laughingthrush	Grammatoptila striatus	LC	3
228	Spot-winged Grosbeak	Mycerobas melanozanthos	LC	5
229	Steppe Eagle	Aquila nipalensis	EN	3
230	Streaked Spiderhunter	Arachnothera magna	LC	18
231	Striated Bulbul	Alcurus striatus	LC	3
232	Striated Heron	Butorides striata	LC	9
233	Striated Laughingthrush	Grammatoptila striatus	LC	9
234	Striated Prinia	Prinia crinigera	LC	8
235	Stripe-throated Yuhina	Yuhina gularis	LC	11
236	Sultan Tit	Melanochlora sultanea	LC	41
237	Tawny Fish Owl	Ketupa flavipes	LC	5
238	Tickell's Leaf Warbler	Phylloscopus affinis	LC	2
239	Tufted Duck	Aythya fuligula	LC	10

SI. No.	Common Names	Scientific Name	Conservation Status	Total Count (n)
240	Wallcreeper	Tichodroma muraria	LC	17
241	Wedge-tailed Green Pigeon	Treron sphenurus	LC	98
242	Whiskered Yuhina	Yuhina flavicollis	LC	53
243	Whistler's Warbler	Phylloscopus whistleri	LC	2
244	White Wagtail	Motacilla alba	LC	116
245	White-bellied Redstart	Luscinia phaenicuroides	LC	4
246	White-browed Bush Robin	Tarsiger indicus	LC	2
247	White-browed Fulvetta	Fulvetta vinipectus	LC	7
248	White-browed Scimitar Babbler	Pomatorhinus schisticeps	LC	3
249	White-browed Wagtail	Pomatorhinus schisticeps	LC	27
250	White-capped Water Redstart	Phoenicurus leucocephalus	LC	166
251	White-crested Laughingthrush	Garrulax leucolophus	LC	94
252	White-gorgeted Flycatcher	Anthipes monileger	LC	1
253	White-rumped Munia	Lonchura striata	LC	7
254	White-rumped Shama	Copsychus malabaricus	LC	1
255	White-tailed Nuthatch	Sitta himalayensis	LC	5
256	White-tailed Robin	Myiomela cambodiana	LC	1
257	White-throated Bulbul	Alophoixus flaveolus	LC	12
258	White-throated Dipper	Cinclus cinclus	LC	2
259	White-throated Fantail	Rhipidura albicollis	LC	7
260	White-throated Kingfisher	Halcyon smyrnensis	LC	27
261	White-throated Laughingthrush	Pterorhinus albogularis	LC	19
262	White-throated Needletail	Hirundapus caudacutus	LC	2
263	White-winged Redstart	Phoenicurus erythrogastrus	LC	15

SI. No.	Common Names	Scientific Name	Conservation Status	Total Count (n)
264	Wood Snipe	Gallinago nemoricola	LC	2
265	Wreathed Hornbill	Pterorhinus albogularis	VU	21
266	Yellow-bellied Fantail	Chelidorhynx hypoxanthus	LC	5
267	Yellow-bellied Flowerpecker	Dicaeum melanozanthum	LC	4
268	Yellow-billed Blue Magpie	Urocissa flavirostris	LC	2
269	Yellow-breasted Greenfinch	Chloris spinoides	LC	13
270	Yellow-rumped Honeyguide	Indicator xanthonotus	LC	1
271	Yellow-vented Warbler	Phylloscopus cantator	LC	2
			Total Count	7,405

# Other wildlife list:

SI. No.	Common Name	Scientific Name	Conservation Status	Total count (n)
1	Arunachal Macaque	Macaca munzala	EN	24
2	Asian Elephant	Elephas maximus	EN	8
3	Asian small-clawed Otter	Aonyx cinereus	VU	7
4	Asiatic Golden Cat	Catopuma temminckii	NT	2
5	Assamese Macaque	Macaca assamensis	NT	356
6	Barking Deer	Muntiacus muntjak	LC	22
7	Capped Langur	Trachypithecus pileatus	EN	223
8	Golden Langur	Trachypithecus geei	EN	156
9	Himalayan Goral	Naemorhedus goral	NT	34
10	Grays/Bhutan Giant Flying Squirrel	Petaurista nobilis	NT	2
11	Hanuman Langur/Gray Langur	Semnopithecus sp	LC	67
12	Himalayan striped Squirrel	Tamiops mcclellandii	LC	3
13	Irrawaddy Squirrel	Callosciurus pygerythrus	LC	4
14	Malayan Giant Squirrel	Ratufa bicolor	NT	1
15	Orange-bellied Himalayan Squirrel	Dremomys lokriah	LC	4
16	Pallas's Squirrel	Callosciurus erythraeus	LC	1
17	Rhesus Macaque	Macaca mulatta	LC	58
18	Sambar	Rusa unicolor	VU	7
19	Smooth-coated Otter	Lutrogale perspicillata	Vu	86
20	Water Buffalo	Bubalus arnee	EN	1
21	Wild Boar	Sus scrofa	LC	4
22	Common Leopard	Prionailurus bengalensis	LC	2
23	Yellow-throated Marten	Martes flavigula	LC	10
	1		Total Count	1082

# **List of Surveyors:**

SI. No	Name	Division	Survey Area
1	Sherab Jamtsho	ZFD	Upper Chamkharchhu
2	Nim Dorji	ZFD	Upper Chamkharchhu
3	Tshering Dorji	ZFD	Lower Chamkharchhu
4	Kinley Dorji	ZFD	Upper Mangdechhu(Pierchen -Goling)
5	Thinley Tshering	ZFD	Upper Mangdechhu(Pierchen -Goling)
6	Ugyen Dorji	ZFD	Panbang-Kurigongri side
7	Kiran Mongar	ZFD	Panbang-Kurigongri side
8	Sangay Tenzin	JDNP	Mochu area
9	Kinga	JDNP	Mochu area
10	Leki Wangdi	JDNP	Phochu area
11	Namgay	JDNP	Phochu area
12	Tshering	BWS	Bumdeling
13	Karma Zangmo	BWS	Bumdeling
14	Ugyen Wangmo	BWS	Bumdeling
15	Norbu Gyeltshen	Gedu FD	Wangchu Area
16	Ngawang Tenzin	Taksha Park Range	Taksha area
17	Tshering Dorji	Taksha Park Range	Taksha area
18	Rinchen Dorji	Taksha Park Range	Taksha area
19	Kado Rinchen	JSWNP	Mangdechhu
20	Passang Gyelmo	JSWNP	Mangdechhu
21	Sanjit Kumar Rai	JSWNP	Mangdechhu

SI. No	Name	Division	Survey Area
22	Tshering	JSWNP	Mangdechhu
23	Gempa	Tsirang FD	Balwani
24	Birkha Bdr. Mongar	Tsirang FD	Waakleytar-Burichhu
25	Chhimi Dorji	Tsirang FD	Burichhu -Sunkosh Goan
26	Jigme Zangpo	Tsirang FD	Balwani-Malbassy
27	Ran Bdr Rai	DFD	Gumti-sama Dovan
28	Milan Kr. Rai	DFD	Gumti-sama Dovan
29	Ugyen Tenzin	DFD	Kalikhola Khurul-Devitar Jigmecholing
30	Durga Parsad Gurung	DFD	Kalikhola Khurul-Devitar Jigmecholing
31	Passang Gurung	DFD	Kalikhola Khurul-Devitar Jigmecholing
32	Nim Tshering Tamang	DFD	Kalikhola Khurul-Devitar Jigmecholing
33	Tendi Zangmo	DFD	Pelichhu-Dagachhu Confluence
34	Sangay Tshering	DFD	Pelichhu-Dagachhu Confluence
35	Phurba	DFD	Pelichhu-Dagachhu Confluence
36	Kencho Wangdi	DFD	Pelichhu-Dagachhu Confluence
37	Cheten Dorji	MFD	Drangmechhu(Rllongri-Sherchhu)
38	Tshering Choki	MFD	Drangmechhu(Rllongri-Sherchhu)
39	Lhadarla	MFD	Kurigongri Confluence - Kurizam
40	Tashi Wangchuk	MFD	Kurigongri Confluence - Kurizam
41	Nidup Dori	MFD	Kurigongri Confluence - Kurizam
42	Tendrel Wangdie	MFD	Khoma-Lhuentse area, Dorjilung Autsho area
43	Sanjip Rai	MFD	Khoma-Lhuentse area, Dorjilung Autsho area

SI. No	Name	Division	Survey Area
44	Dorji Rabten	Phibsoo WS	Phibsoo & Longa, other potential rivers
45	Cheten Wangda	Phibsoo WS	Phibsoo & Longa, other potential rivers
46	Tshering Nidup	Phibsoo WS	Phibsoo & Longa, other potential rivers
47	Tashi Phuntsho	Phibsoo WS	Phibsoo & Longa, other potential rivers
48	Pema Jamtsho	Phibsoo WS	Phibsoo & Longa, other potential rivers
49	Namgay Dorji	Phibsoo WS	Phibsoo & Longa, other potential rivers
50	Jigme Pelden	Phibsoo WS	Phibsoo & Longa, other potential rivers
51	Rekila	Phibsoo WS	Phibsoo & Longa, other potential rivers
52	Ugyen Wangchuk (P)	Phibsoo WS	Phibsoo & Longa, other potential rivers
53	Penden Wangchuk	Phibsoo WS	Phibsoo & Longa, other potential rivers
54	Laxman Tamang	Phibsoo WS	Sama Dovan-Karmaling -Lhamoizingkha
55	Pema Dorji	Phibsoo WS	Sama Dovan-Karmaling -Lhamoizingkha
56	Karma Chedup	Phibsoo WS	Sama Dovan-Karmaling -Lhamoizingkha
57	Dorjila	Phibsoo WS	Sama Dovan-Karmaling -Lhamoizingkha
58	Namgyel Tenzin	Phibsoo WS	Sama Dovan-Karmaling -Lhamoizingkha
59	Passang Dorji Tamang	Phibsoo WS	Sama Dovan-Karmaling-Lhamoizingkha
60	Pema Tshering	Pemagatshel FD	Tshobaley-Yangbari-Kurigonri confluence
61	Cheki Wangdi	Pemagatshel FD	Tshobaley-Yangbari-Kurigonri confluence
62	Sonam Wangchuk	Pemagatshel FD	Tshobaley-Yangbari-Kurigonri confluence
63	Singye Wangchuk	Trashigang FD	Rollongri-Drangmeychu-Gengkhar/Thangrong
64	Yourpee	Trashigang FD	Rollongri-Drangmeychu-Gengkhar/Thangrong
65	Karma Jamtsho	Trashigang FD	Rollongri-Jamkhardang

SI. No	Name	Division	Survey Area
66	Jigme Thinley	Trashigang FD	Rollongri-Jamkhardang
67	Pema Tshewang(A)	Trashigang FD	Jamkhardang-Doksum
68	Pema Tshewang(B)	Trashigang FD	Jamkhardang-Doksum
69	Kuenzang Choden	Trashigang FD	Doksum-Gongza
70	Rinzin Phuntsho	Trashigang FD	Doksum-Gongza
71	Sonam Dorji(A)	Trashigang FD	Drangmechhu-Gamri
72	Sonam Dorji(B)	Trashigang FD	Drangmechhu-Gamri
73	Kezang Thinley	Trashigang FD	Khencholing-Dongdi
74	Rinchen Choeda	Trashigang FD	Khencholing-Dongdi
75	Ngawang Namgyel	RMNP	Chamkharchhu
76	Damber Bdr. Chhetri	RMNP	Tsaidang
77	Dew Bdr. Dahal	RMNP	Chamkharchhu
78	Kinley Dorji	RMNP	Lower Mangdechhu
79	Chundu Dorji.	RMNP	Lower Mangdechhu
80	Pema Loday	RMNP	Lower Mangdechhu
81	Raj Kumar Choudhary	RMNP-Boat man	Lower Mangdechhu
82	Pema Tobgay	RMNP-Boat man	Lower Mangdechhu
83	Mitralal Ghalley	RMNP-Boat man	Lower Mangdechhu
84	Tashi Gyeltshen	RMNP-Driver	Lower Mangdechhu
85	Kezang Phuntsho	Wangdue FD	Punatshangchhu upper-stream
86	Dorji Gyeltshen	Wangdue FD	Punatshangchhu upper-stream
87	Karpola	Wangdue FD	Punatshangchhu upper-stream

SI. No	Name	Division	Survey Area
88	Chimi Dorji	Wangdue FD	Punatshangchhu upper-stream
89	Kinley Rabgay	Wangdue FD	Punatshangchhu upper-stream
90	Yeshey	Wangdue FD	Punatshangchhu upper-stream
91	Tashi Phuntsho	Wangdue FD	Punatshangchhu upper-stream
92	Damchoe Younten	RSPN	Zhemgang
93	Tshering Tobgay	RSPN	Zhemgang
94	Indra Acharja	RSPN	Jigmechhu
95	Tenzin Dorji	RSPN	Jigmechhu
96	Thinley Phuntsho	RSPN	Balwani
97	Tshewang Lheundup	RSPN	Sam-Dovan
98	Sonam Tshering	RSPN	Dagachhu
99	Lungten	Intern RSPN	Taksha
100	Sonam Yeshi	Intern RSPN	Taksha
101	Wangdi Zam	RSPN	WBHCC
102	Samten Leki	RSPN	WBHCC
103	Dorji	Local Surveyor	Berti Zhemgang
104	Tshering Norbu	Local Surveyor	Pantang Zhemgang
105	Penjor	Local Surveyor	Harachhu
106	Chador	Local Surveyor	Zawa
107	Phurba	Local Surveyor	Tsaidang
108	Sigay Dorji	Local Surveyor	Chachey
109	Dil Kumar Subba	Local Surveyor	Kalikhola

SI. No	Name	Division	Survey Area
110	Kinley Penjor	Local Surveyor	Punakha
111	Kharka Sign Chhetri	Local Surveyor	Sunkosh
112	Karna Bdr Tamang	Local Surveyor	Toisang
113	Garjaman	Local Surveyor	Balwani
114	Nar Bdr Rai	Local Surveyor	Wangchuk
115	Tshering Dorji	Local Surveyor	Wangchuk
116	Ektar Subbha	Local Surveyor	Rangitar
117	Nima	Local Surveyor	Dagachhu
118	Lhaba	Local Surveyor	Dagachhu
119	Suk Bdr Gurung	Local Surveyor	Kalikhola
120	Goray Sherpa	Local Surveyor	Kalikhola
121	Choki Dorji	Local Surveyor	Wangchuk
122	Suk Bdr Rai	Local Surveyor	Wangchuk







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