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Birds of Dang Deukhuri Foothill forests and West Rapti Wetlands: An Important Bird and Biodiversity Area, Nepal

Chiranjeevi Khanal^{1*} | Carol Inskipp^{2,3} | Tikaram Giri⁴

- ¹Division Forest Office Dang (Deukhuri), Lumbini Province, Nepal
- ²Himalayan Nature, Kathmandu, Nepal
- ³High Street, Stanhope, Bishop Auckland, Co. Durham DL132UP, UK
- ⁴Bird Education Society, Nepal. Chitwan Gaida Lodge, Sauraha, Chitwan, Nepal
- *Correspondence: chirankhanal1@gmail.com

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Abstract

Information on the Dang Deukhuri Foothill Forests and West Rapti Wetlands Important Bird and Biodiversity Area (DDWR IBA) is updated. When the DDWR was first assessed as an IBA in 2005, little information about the area was available. IBA designation was based on the area supporting a significant population of one globally threatened species, white-rumped vulture Gyps bengalensis (A1). Although no bird survey had been carried out, the DDWR has a large area of suitable habitat thought very likely to support significant populations of bird species in the Indo-Malayan tropical dry zone, so fulfilling the biome-restricted species criterion (A3). Evidence for designation of the DDWR IBA was significantly strengthened in this study. A bird survey was carried out in the Deukhuri Valley in the DDWR IBA and a desk study researched other sources of bird records including ebird. A total of 319 bird species was recorded up to the end of April 2023 including significant populations of six globally threatened species (whiterumped vulture, slender-billed vulture Gyps tenuirostris, red-headed vulture Sarcogyps calvus, Egyptian Vulture Neophron percnopterus, steppe eagle Aquila nipalensis and great slaty woodpecker Mullericpicus pulverulentus. A total of 30 species characteristic of the Indo-Malyan tropical dry zone has been recorded, representing a high percentage of 68 per cent of the total recorded in Nepal in this biome. Further research of species diversity focusing on birds and mammals in DDWR and the preparation and implementation of a conservation management strategy including increasing the conservation awareness outreach activities amongst local communities are recommended.

Keywords: Bird survey; Globally threatened species; Species diversity; Updated assessment

1 | Introduction

The Important Bird and Biodiversity (IBA) programme is a worldwide initiative led by BirdLife International aimed at identifying, documenting and working towards the conservation and sustainable development of a network of critical sites for the world's birds and other biodiversity, termed IBAs. Bird Conservation Nepal is leading this initiative in Nepal, aided by BirdLife International. IBAs are places of international significance for the conservation of birds at the global level and, in addition, hold a large and representative proportion of other biodiversity. They are identified using standardised, internationally agreed criteria (BirdLife International 2014).

Designation of the DDWR IBA was based on the globally threatened species and biome-restricted species criteria (Baral & Inskipp 2005). A partial survey of vulture nests along the East-West highway in 2003 found a total of 51

occupied nests of white-rumped vulture Gyps bengalensis. Considering the available habitat, more vulture nests were considered likely to be present (Baral & Chaudhary 2003). The DDWR therefore supported a significant population of this globally threatened species so fulfilling the globally threatened criterion for this IBA (A1) (Baral & Inskipp 2005).

Although no bird survey of DDWR had been carried out by 2005, the large extent of dry tropical forests in DDWR were thought to likely support significant populations of characteristic species of the Indo-Malayan tropical dry zone biome, so fulfilling the biome-restricted species criterion for the IBA (A3) (Baral & Inskipp 2005).

This research article aims to update previous published information on the Dang Deukhuri and West Rapti Wetlands (DDWR) Important Bird and Biodiversity Area (IBA). DDWR was designated an IBA in the first assessment of IBAs in Nepal, although it was relatively poorly known for birds and other wildlife at that time (Baral & Inskipp 2005).

Research work carried out by the authors comprised compiling a bird checklist for DDWR IBA based on a bird survey carried out by the authors from 27 February to 4 March 2023, and on a desk study extracting records from ebird and other sources up to the end of April 2023. The compiled checklist provided stronger evidence for the designation of DDWR as an IBA. The survey work and desk study research also identified current threats and conservation management issues.

2 | Materials and methods

2.1 | Study area

DDWR lies outside Nepal's protected areas' system in the mid-west of the country in Dang district of Lumbini Province. Its area covers approximately 150,000ha between the geographical coordinates $28^{\circ}00'N$ $82^{\circ}25'E$ - $28^{\circ}00'N$ $82^{\circ}58'E$ and the altitudinal range is from 200-900m in the tropical zone (Baral & Inskipp 2005).

In the Deukhuri Valley, the principal vegetation is tropical dry forest where forests are mainly dominated by Sal *Shorea robusta* or *Dalbergia- acacia*, with patches of *Terminalia alata* and also degraded forest with species including *Emblica officinalis, Lagerstroemia parviflora, Berberis* spp. (Khanal & Baniya 2018). Degraded grasslands of *Typha angustifolia and Saccharum spontaneum* occur along the Rapti River. The East-West highway passes through the valley with a length of about 75 km. The West Rapti River flows through the length of the Deukhuri valley in the inner terai after emerging from Pyuthan district of the midhills.

and join the Rapti River which flows across the valley. The land is very fertile and has four local government offices: one municipality (Lamahi), and three rural municipalities (Rajpur, Gadawa, and Rapti) (Khanal & Baniya 2018). Recently a part of Deukhuri Valley, known as the "Rapti Valley", has been declared the capital of Lumbini Province.

2.2 | Methods

A bird survey was carried out in the Deukhuri Valley within the DDWR IBA for six days from 27 February to 4 March 2023. Routes were of lengths ranging from 5 to 9 km on existing trails. Birds were surveyed in Gobardiha, Saljundi, Deuki, Karri, Sarwadaya and Uchanimbu, Community Forests (CF); the Rapti River and riverbanks, farmland and village areas (Annex 1). These surveys were designed to cover all habitat types in the Deukhuri Valley. Bird species heard and seen and the numbers of individuals of each species were recorded on each survey route. The binoculars used were pairs of 8x30 Zeiss, 10x42 Bushnell and Swarovski 8.5×42; also a Celestron telescope. On 3 March, a count was made from the rooftop of our homestay of numbers of individuals of bird species flying to roost over Banghusri village. Calls and signs of mammals were also noted on each survey route. Each day surveys were conducted in the morning and late afternoon. In addition, nocturnal birds were regularly recorded around Bagarapur Homestay in Rapti Rural Municipality and Banghusri Homestay in Lamahi Municipality where the researchers stayed during the survey period. A total list of bird species encountered during our surveys was collated (Giri et al. 2003). The bird taxonomy used here follows DNPWC and BCN (2022) and conservation

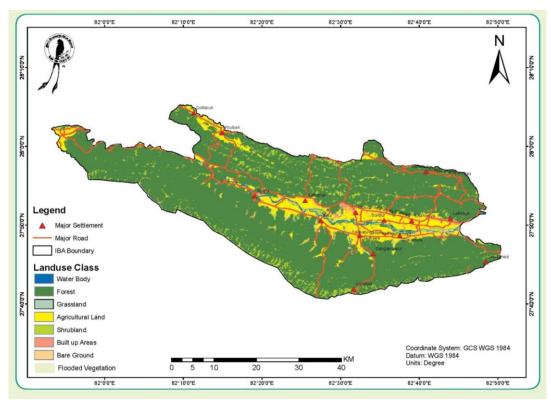


Figure 1. Map of the IBA (Dang Deukhuri Foothill Forests and West Rapti Wetlands) Source: Bird Conservation Nepal

The Deukhuri valley forms a catchment area where small rivers including the Rihar, Dolai, and Arjun, flow downhill

status follows the IUCN Red List of Threatened Species (2023). A desk study was carried out to compile a complete

bird checklist for the whole IBA up to the end of April 2023. References used included a published bird checklist based on surveys carried out throughout the DDWR IBA in 32 days in autumn (19 to 29 October 2008), winter (15 to 21 January 2009), spring (18 to 24 March 2009) and summer (3 to 11 June 2009) (Thakuri 2009a, b). Other references used included records of bird watchers and researchers and a few verified records from the Division Forest Office, Deukhuri. Records were also extracted from eBird: Sanjib Acharya, 20 January 2011, 5 and 6 June 2022; Krishna Bhusal, 3 January and 23 December 2013, 18 September 2022; Anand Chaudhary, 2021 to 2023; Mich Coker, 29 June 2017; Hemanta Dhakal, 27 December 2011; Ian Hearn, 14 April 2021; Yubin Shrestha, 4 and 12 December 2021, Yubin Shrestha and Deepak Budhathok, 14 April 2022 and Karmath Subedi eBird 11 July 2022. The remaining records were extracted from Annual Waterbird Counts data (2009-2023), and a few casual observations between 16 April and 4 May 2007 from Cox (2008).

After the bird checklist was compiled, the number of bird species in the list was totalled. The checklist was annotated with the reference for the first record of each species (Annex 2). Species in the checklist were then annotated with their IUCN status. All records of species listed as globally threatened in the IUCN Red List were extracted from the references and used to determine which of these species had significant populations in the DDWR IBA.

The checklist was also annotated with the characteristic breeding species of the Indo-Malayan tropical dry zone biome which have been recorded. The occurrence of these species was used to determine whether a significant number of species are supported within the DDWR IBA.

Bird species recorded that are nationally threatened an on the Nepal Red List and CITES-listed species were also annotated on the checklist. Mammal, reptile and fish records were extracted from published articles and reports and globally threatened, and near-threatened species were identified using the IUCN Red List.

3 | Results

A total of 146 bird species was recorded in our field survey including 18 species not found in the DDWR IBA previously (Annex 2). Globally threatened species recorded were white-rumped vulture, slender-billed vulture *Gyps tenuirostris*, steppe eagle *Aquila nipalensis*, and great slaty woodpecker *Mulleripicus pulverulentus*. A total of 30 species characteristic of the Indo-Malayan tropical dry zone biome were recorded (Annex 2).

In the first bird survey of DDWR IBA 246 species were found (Thakuri 2009a, b). Additional species recorded by other observers were: ten (Sanjib Acharya, eBird); 14 (Anand Chaudhary eBird); one (Mich Coker eBird); seven (Cox 2008); 18 (Giri et al. 2023); one (Ian Hearn eBird); 15 (Chiranjeevi Khanal Pers. Obs.); one (Yubin Shrestha eBird), one (Karmath Subedi eBird) and three (Annual Waterbird Counts 2009–2023). In total 319 species are known to have been recorded in DDWR IBA up to the end of April 2023 (Annex 1).

This IBA was found to support significiant populations of six globally threatened species: Egyptian vulture *Neophron percnopterus*, white-rumped vulture *Gyps bengalensis*, Slender-billed vulture *G. tenuirostris*, Red-headed vulture *Sarcogyps calvus*; Steppe eagle *Aquila nipalensis* and great slaty woodpecker *Mulleripicus pulverentus*. Details of the records of these species follow.

Egyptian vulture Neophron percnopterus

Globally Endangered. Egyptian vulture is an uncommon breeding resident in DDWR and Nepal.

In 2008 and 2009: one over Rapti Bank at Chaulahi on 20 October 2008; two over Padhmini Khola, Satbariya 25 October 2008; one over Rapti Bank at Chaulahi on 16 January 2009; one at Gangaparaspur on 19 March 2009; two at Rihar on 4 June 2009; two at Amilya on 6 June 2009; two at Gobardiya on 7 June 2009 and six at Lalmatiya on 10 June 2009 (Thakuri 2009a, b).

In later years: four were recorded at Lalmatiya on 27 December 2011 (Hemanta Dhakal, eBird); four in DDWR on 3 January 2013 (Krishna Bhusal, eBird); 12 on the Rapti bank at Maurighat in January 2019 (Chiranjeevi Khanal Pers. Obs.); one in Rapti wetlands, Bhalubang on 14 April 2022 (Yubin Shrestha & Deepak Budhathok, eBird); eight on Rapti bank at Bhaluwang on 14 January 2023 and five Rapti bank at Hasnapur on 27 January 2023 (Chiranjeevi Khanal Pers. Obs.).

White-rumped vulture *Gyps bengalensis*

Globally Critically Endangered. White-rumped vulture is a local and uncommon breeding resident in DDWR IBA and is generally a rare breeding resident in Nepal.

In 2010/11, there were 50 active nests in DDWR, 28 nests in 2011/12, 30 in 2012/13, 26 in 2013/14 and 20 active nests in 2014/15. The nests were in Goberdia, Kaptangunj, Hanspur and Lalmatiya areas in the IBA. Since the first IBAs of Nepal listing (Baral & Inskipp 2005), this IBA has been extended up to the Charinge Lake area, where 17 active nests have been recorded (BCN unpublished data). A total of 25 nests of white-rumped vultures were counted in Uchanimbu Community Forest area in July 2018 (Suman Ghimire Pers. Comm., July 25, 2018). On 4 March 2023, 50 individuals were counted at Uchanimbu, where there were 19 active nests (Giri et al. 2023). During the 2023 Annual Waterbird count, 17 individuals were seen on the Sisahniya to Bhaluwang section of the Rapti on 12 January 2023 and six were seen at at Hasnapur, Rapti river on 17 January 2023 (Chiranjeevi Khanal, Pers. Obs.).

Slender-billed vulture Gyps tenuirostris

Globally Critically Endangered. Slender-billed vulture is a rare breeding resident in DDWR IBA and Nepal.

Two individuals were seen at Trisuldhari, Satbariya on 20 January 2009 and three at Lalmatiya on 21 January 2009 (Thakuri 2009a, b). One was seen at Lalmatiya on 27 December 2011 (Hemanta Dhakal, eBird); one in Rajpur in July 2018 (Chiranjeevi Khanal Pers. Obs.), and one in DDWR IBA on 14 April 2021 (Ian Hearn, eBird). A pair was seen mating on a nest in the white-rumped Vulture colony at Uchanimbu on 4 March 2023.



Figure 2. Slender-billed vulture resting on *Pinus roxburgi* tree in Rajpur (Photo: Rajeev Dangi)

Red-headed vulture Sarcogyps calvus

Globally Critically Endangered. Red-headed vulture is an uncommon resident in DDWR IBA and generally a rare resident in Nepal.

One was seen flying over Gadhwa on 21 October 2008 and two at Lalmatiya on 21 January 2009 (Thakuri 2009a, b). An unknown number was recorded in the Rapti wetlands, Bhalubang on 20 January 2011 (Sanjib Acharya, eBird); one at Hanseswor Temple and Badka Mahali area on 27 November 2011 (Anand Chaudhary, eBird); two on 3 January 2013, one on 23 December 2013 and two on 18 September 2022 in the IBA (Krishna Bhusal, eBird); three by the Rapti between Sisahniya and Bhaluwang on 12 January 2023 and three on 27 January 2023 on Rapti river bank at Hasnapur (Chiranjeevi Khanal Pers. Obs.).

Steppe eagle Aquila nipalensis

Globally Endangered. Steppe eagle is an uncommon winter visitor and passage migrant to DDWR IBA and locally frequent winter visitor and passage migrant to Nepal.

Two were recorded at an unknown locality in winter 2008/2009 (Thakuri 2009a, b); one on 29 November 2021 at Khinaita village (Anand Chaudhary, eBird); one on 2 December 2021 at Gangdi (Anand Chaudhary, eBird); one on 7 March 2022 at Sisahaniya Farmlands (Anand Chaudhary, eBird); one on 4 December 2021 in Lamahi Greenbelt (Yubin



Figure 3. Great slaty woodpecker (Photo: Rajeev Dangi).

Shrestha, eBird) and one on 27 February 2023 near Bagarapur (Giri et al. 2023).

Great slaty woodpecker Mulleripicus pulverulentus

Globally Vulnerable. Great slaty woodpecker is a local and uncommon breeding resident in DDWRA IBA and in Nepal.

One from an unknown locality in DDWR was seen in the summer of 2009 (Thakuri 2009a, b). Later the species was recorded in Karri Community Forest: one on 18 July 2019 and five on 16 August 2019 (Khanal & Dangi 2020), and two in December 2021 (Chiranjeevi Khanal Pers. Obs.). One was seen in Karri Community Forest on 2 March 2023 (Giri et al. 2023) and four in Sarwadaya Community Forest on 3 March 2023 (Giri et al. 2023).

Other notable bird records

Lesser Adjutant Leptoptilos javanicus

Globally Near Threatened. Lesser adjutant is a frequent breeding resident in Nepal.

One or two were seen at Bhalubang, West Rapti River, on 20 January 2011 (Sanjib Achyarya, eBird) and one by the Rapti River on 24 January 2014 (Annual Wetland Bird Count).

Asian woollyneck Ciconia episcopus

Globally Near Threatened. Asian woollyneck is a frequent breeding resident in Nepal. A total of 15 (the greatest number recorded in the DDWR IBA) was seen on 10 November 2015 on a small Rapti River island. Six were seen in 2016 in Jahare Bridge area, Rapti River and four in 2018 flying over the eastern side of the Rapti. Single birds have been recorded occasionally in different parts of the IBA (Chiranjeevi Khanal Pers. Obs.).

Spot-bellied eagle-owl Bubo nipalensis

Spot-bellied eagle-owl is a local and rare breeding resident in Nepal. One was recorded in the DDWR IBA in January 2009 (Thakuri 2009a, b).

Cinereous vulture Aegypius monachus

Globally Near Threatened. Cinereous vulture is an uncommon winter visitor in Nepal. Two were seen at Lalmatiya on 27 December 2011 (Hemanta Dhakal, eBird); four in DDWR on 3 January 2013 and two there on 23 December 2013 (Krishna Bhusal, eBird). One was seen between Bhaluwang and Sisahniya, Rapti River in February 2018 and one there in January 2019 (Chiranjeevi Khanal Pers. Obs.). One was seen at Gobardiya, Dakhin Chowk on 14 January 2023 (Anand Chaudhary, eBird).

Greater spotted eagle Clanga clanga

Globally Vulnerable. Greater spotted eagle is an uncommon winter visitor and winter visitor to Nepal.

One was seen on the Rapti bank at Chaulahi on 20 October 2008 (Thakuri 2009a, b).

Great hornbill Buceros bicornis

Globally Vulnerable. Great hornbill is an uncommon and local breeding resident in Nepal.

One was observed on 14 February 2023 in a forest area close to a road way crossing the Churia hills from Sunpathri village

to Baisahi Naka of Rajpur Rural Municipality (Chiranjeevi Khanal Pers. Obs.).

Alexandrine parakeet Palaeornis eupatria

Globally Near Threatened. Alexandrine Parakeet is a locally common breeding resident in Nepal and a common resident in DDWR.

On 3 March, the large number of 524 individuals was counted flying east to roost over Banghusri Village in 16 minutes from 18:06 hr to 18:22 hr (Giri et al. 2023).

White-tailed robin Mylomela leucura

One was seen in Deuki Community Forest on 1 March 2023 (Giri et al. 2023), a new locality for this species and the only known record from mid and far western Nepal.

Dark-sided thrush Zoothera margin

Two were seen in Sarwadaya Community Forest on 3 March 2023 (Giri et al. 2023) a new locality for this species, which is very rare in mid and far western Nepal.

Species characteristic of biome

A total of 19 breeding species characteristic of the Indo-Malayan tropical dry zone was recorded in the DDWR IBA in the present survey; the total was 31 species when combined with records from other sources (Annex 1).

4 | Discussion

A site can qualify as an IBA based on the globally threatened species criterion (A1) if significant numbers of at least one globally threatened species have been recorded. In the first Nepal IBA assessment DDWR qualified as an IBA as significant numbers of the globally threatened Whiterumped Vulture were recorded (Baral & Inskipp 2005). This study shows that evidence for the qualification of DDWR as an IBA has been strengthened: significant numbers of five additional globally threatened species have been recorded: Egyptian vulture Neophron percnopterus, slender-billed vulture *G. tenuirostris*, red-headed vulture *Sarcogyps calvus*, Steppe eagle Aquila nipalensis, and great slaty woodpecker Mulleripicus pulverulentus. The present survey recorded four globally threatened species: breeding white-rumped and slender-billed vultures, also Steppe eagle and the great slaty woodpecker. Other sources, including eBird, recorded six globally threatened species: Egyptian and red-headed vultures, as well as the four species recorded in the present

A site can also qualify as an IBA based on biome-restricted species assemblage criterion (A3). When the first Nepal IBA assessment was made, no bird surveys had been carried out in DDWR. However, the area was considered to qualify under the A3 criterion as there were large dry tropical forest areas that were thought likely to support a significant proportion of characteristic species of the Indo-Malayan tropical dry zone biome (Baral & Inskipp 2005).

Bird surveys which were carried out after the first IBA assessment: Thakuri (2009a, b) and the present survey (Giri et al. 2023), as well as eBird and other sources provide evidence that DDWR does indeed support significant populations of characteristic species of the Indo-Malayan

tropical dry zone biome. The high figure of 68 per cent of the total recorded for this biome in Nepal, has been found in the DDWR IBA.

Thakuri (2009a, b) considered that the unexpectedly low frequency of recording of urban birds and gameBirds (Indian peafowl *Pavo cristatus*, kalij pheasant *Lophura leucomelanos* and red jungle fowl *Gallus gallus*) implied there was a serious hunting and trapping problem. Only one call of Indian peafowl *Pavo cristatus* was heard from the Budikhola, Gobardiya, when more was expected, considering the extent of suitable habitat (Thakuri 2009a, b). A very similar low density of game birds was experienced during the present survey when only one Indian peafowl was heard (in Deuki Community Forest), and no kalij pheasant or Red junglefowl were recorded. During the same survey, very few mammals were recorded (Giri et al. 2023).

White-rumped vultures are threatened by the felling and killing of their nesting trees, electrocution due to open electric wires in and around forest areas, disturbance during the breeding season, and limited vulture conservation awareness (BCN unpublished data). Below the Uchanimbu CF nesting colony the forest land has been converted illegally into agricultural land in recent years. Some big trees of Termanalia tomentosa are still present and are used by vultures as nesting sites above land that local farmers are cultivating. The farmers are worried that vulture droppings will kill their crops. The land belongs to the government so local people are not allowed to cut nesting trees however they have deliberately killed the trees to stop the vultures nesting in and around their cultivation. Now several trees have died and there are no nests in these dead trees (Giri et al. 2023). The only known white-rumped Vulture colonies in DDWR are now at Uchanimbu CF, Kalika CF, Karri Lek (at the top of the Churia hill), and Ramjanaki CF, Rajpur (Chiranjeevi Khanal Pers. Obs.).

The Division Forest Office Dang (Deukhuri) under the Ministry of Forest, Environment, Tourism and Drinking Water of Lumbini Province of Nepal is responsible for the management of a large portion of forest in DDWR whereas some forest portion comes under the Division Forest Office Dang (Dang). A total of 144 community forests and one religious forest are registered at the Division Forest Office, Deukhuri (DFO 2023) and the remaining forest patches are managed as Government-managed forests by the forest office. The Lamahi Bottleneck area is a part of forest land in northern Deukhuri running east-west (82°31′-82°48′) which connects with Banke National Park in the west. A recent study showed that in the last 15 years, this forest area has increased by 20 km² and a number of water sources along identified tributaries has also increased (Thapa et al. 2018). However, encroachment for human settlement and agriculture are continuing problems. Hunting and poaching are also major threats to wildlife in Deukhuri.

Most of the forests in the study area are managed as community forests (CF). Each CF is regulated by its own constitution and forest conservation and management activities are guided by the operational management plan approved by the Division Forest Office (Ghimire & Lamichhane 2020). However, problems such as uncontrolled cattle grazing and forest fire are major hurdles in forest conservation. Other threats include the use of pesticides in

farmlands and also for fishing in the Rapti River. During the winter of 2009, many dead wading birds were found – possibly poisoned by pesticides (Thakuri 2009a, b). Overfishing was observed to take place in the Rapti River in winter when the water level was low (Thakuri 2009a, b). Aquatic birds are highly disturbed by the frequent collection of sand and stones from the riverbed (Thakuri 2009a, b; Giri et al. 2023).

People of the DDWR IBA have very little knowledge about birds and their importance, apart from vulture species (Thakuri 2009a, b) which necessitates the long-term vulture conservation awareness programme in the study area. It is hoped that this long-term data on bird species in DDWR will act as the baseline for future reference, help in further research work, support managers for conservation efforts, and to record any future changes in the composition of bird species of DDWR.

5 | Conclusions

DDWR IBA has a high bird species diversity with 319 recorded species. The area supports significant populations of six globally threatened bird species so fulfilling the globally threatened species criterion for IBA status (A1). Compilation of a comprehensive bird checklist shows the high percentage of 68 per cent of species characteristic of the Indo-Malayan tropical dry zone that occur in Nepal have been recorded in DDWR IBA, so fulfilling the biome-restricted criterion (A3) further justifying its IBA status. The presence of globally threatened mammals and reptiles shows the high value of the DDWR IBA to other wildlife. We recommend further research of species diversity focusing on birds and mammals in DDWR, and also to prepare and implement a conservation management strategy including increasing the conservation awareness outreach activities at the community level.

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Authors' contributions

C.K. carried out fieldwork, compiled the checklist of birds, and prepared the manuscript. C.I. carried out fieldwork, compiled a checklist of birds and revised the manuscript. T.G. participated in the field survey and compiled a checklist of birds.

Conflicts of interest

The authors declare no conflict of interest.

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Annex 1. Survey routes, Deukhuri Valley, 27 February – 4 March 2023

Date	Time (hr)	Survey route	Survey Length (km)
27 February	15.30-18.00	Rapti River and farmland near Bagarapur	5
28 February	08.00-11.00	Galbardia Community Forest	7
28 February	15.00-18.00	Saljandi Community Forest, farmland, village area, Rapti River	7
1 March	0800-11.00	Deuki Community Forest	
1 March	15.30-18.00	Banghusri village, farmland, Rapti River	8
2 March	0800-11.30	Karri Community Forest	8
2 March	15.30-18.00	Rapti River near Banghusri	7
3 March	07.30-11.00	Sarwadaya Community Forest	9
3 March	17.30-18.20	Bird roost count from Banghusri homestay	0
4 March	08.00-11.00	Vulture nesting colony, Uchanimbu	5

Annex 2. Bird list in Dang Deukhuri Foothill Forests & West Rapti Wetlands IBA

English name	Scientific name	Ref. number	IUCN	NRDB	BRS	CITES
Black francolin	Francolinus francolinus	10	LC	LC		
Grey francolin	Francolinus pondicerianus	10	LC	VU		
Common quail	Coturnix coturnix	10	LC	LC		
Indian peafowl	Pavo cristatus	10	LC	NT	X	III
Red junglefowl	Gallus gallus	10	LC	LC		
Kalij pheasant	Lophura leucomelanos	10	LC	LC		III
Lesser whistling-duck	Dendrocygna javanica	10	LC	LC		
Bar-headed goose	Anser indicus	11	LC	NT		
Common merganser	Mergus merganser	10	LC	LC		
Ruddy shelduck	Tadorna ferruginea	10	LC	NT		
African comb duck	Sarkidiornis melanotos	9	LC	EN		II
Cotton pygmy-goose	Nettapus coromandelianus	7	LC	VU		
Red-crested pochard	Netta rufina	2	LC	LC		
Gadwall	Mareca strepera	1	LC	LC		
Eurasian wigeon	Mareca penelope	10	LC	LC		
Indian spot-billed duck	Anas poecilorhyncha	7	LC	NT		
Mallard	Anas platyrhynchos	1	LC	LC		
Northern pintail	Anas acuta	10	LC	EN		
Common teal	Anas crecca	10	LC	LC		
Little grebe	Tachybaptus ruficollis	11	LC	LC		
Great crested grebe	Podiceps cristatus	1	LC	LC		
Rock dove	Columba livia	10	LC	LC		
Oriental turtle-dove	Streptopelia orientalis	10	LC	LC		
Eurasian collared-dove	Streptopelia decaocto	10	LC	LC		
Red turtle-dove	Streptopelia tranquebarica	10	LC	LC		
Western spotted dove	Spilopelia suratensis	10	LC	LC		
Laughing dove	Spilopelia senegalensis	2	LC	LC		
Grey-capped emerald dove	Chalcophaps indica	10	LC	LC		
Yellow-footed green-pigeon	Treron phoenicopterus	10	LC	LC	X	
Large-tailed nightjar	Caprimulgus macrurus	6	LC	NT	Λ	
Indian nightjar	Caprimulgus asiaticus	10	LC	EN	X	
Savanna nightjar	Caprimulgus affinis	6	LC	NT	А	
Crested treeswift	Hemiprocne coronate	10	LC	LC		
White-throated needletail	-	10	LC	LC		
	Hirundapus caudacutus Aerodramus brevirostris					
Himalayan swiftlet		2	LC LC	LC LC		
Asian palm-swift	Cypsiurus balasiensis					
Alpine swift	Tachymarptis melba	10	LC	LC		
House swift	Apus nipalensis	6	LC	LC		
Greater coucal	Centropus sinensis	10	LC	LC		
Lesser coucal	Centropus bengalensis	10	LC	LC		
Sirkeer malkoha	Taccocua leschenaultia	10	LC	LC	X	
Green-billed malkoha	Phaenicophaeus tristis	10	LC	LC		
Jacobin cuckoo	Clamator jacobinus	10	LC	LC		
Western koel	Eudynamys scolopaceus	10	LC	LC		
Banded bay cuckoo	Cacomantis sonneratii	4	LC	LC		
Common hawk-cuckoo	Hierococcyx varius	10	LC	LC		
Indian cuckoo	Cuculus Micropterus	10	LC	LC		
Common cuckoo	Cuculus canorus	10	LC	LC		
Brown crake	Zapornia akool	3	LC	LC		
White-breasted waterhen	Amaurornis phoenicurus	10	LC	LC		
Common moorhen	Gallinula chloropus	10	LC	LC		
Common coot	Fulica atra	10	LC	LC		
Demoiselle crane	Anthropoides virgo	10	LC	VU		II
Lesser adjutant	Leptoptilos javanicus	1	NT	VU		
Asian openbill	Anastomus oscitans	1	LC	VU		
Black stork	Ciconia nigra	10	LC	VU		II
Asian woollyneck	Ciconia episcopus	10	NT	NT		

Red-naped ibis	Pseudibis papillosa	10	LC	LC		
Cinnamon bittern	Ixobrychus cinnamomeus	10	LC	LC	X	
Green-backed heron	Butorides striata	10	LC	LC		
Indian pond-heron	Ardeola grayii	10	LC	LC		
Cattle egret	Bubulcus ibis	10	LC	LC		
	Ardea cinerea	10	LC	LC		
Grey heron						
Purple heron	Ardea purpurea	10	LC	LC		
Great white egret	Ardea alba	10	LC	LC		
Intermediate egret	Ardea intermedia	10	LC	LC		
Little egret	Egretta garzetta	6	LC	LC		
Little cormorant	Microcarbo niger	10	LC	LC		
Great cormorant	Phalacrocorax carbo	10	LC	NT		
Indian thick-knee	Burhinus indicus	10	LC	LC		
Ibisbill	Ibidorhyncha struthersii	1	LC	EN		
Long-billed plover	Charadrius placidus	10	LC	LC		
Little ringed plover	Charadrius dubius	10	LC	LC		
Northern lapwing	Vanellus vanellus	7	NT	NT		
River lapwing	Vanellus duvaucelii	10	NT	NT		
Yellow-wattled lapwing	Vanellus malabaricus	10	LC	VU	X	
Red-wattled lapwing	Vanellus indicus	10	LC	LC		
Temminck's stint	Calidris temminckii	2	LC	LC		
Little stint	Calidris minuta	6	LC	LC		
Common sandpiper	Actitis hypoleucos	10	LC	LC		
Green sandpiper	Tringa ochropus	10	LC	LC		
Common greenshank	Tringa nebularia	10	LC	LC		
Common redshank	Tringa tetanus	10	LC	LC		
Wood sandpiper	Tringa glareola	4	LC	LC		
Barred buttonquail	Turnix suscitator	10	LC	LC		
Little pratincole	Glareola lacteal	10	LC	NT		
Pallas's gull	Larus ichthyaetus	7	LC	LC		
Little tern	Sternula albifrons	1	LC	VU		
Brown boobook	Ninox scutulata	10	LC	LC		II
Barn owl	Tyto alba	7	LC	VU		II
Collared owlet	Glaucidium brodiei	10	LC	LC		II
Asian barred owlet	Glaucidium cuculoides	10	LC	LC		II
Jungle owlet	Glaucidium radiatum	10	LC	LC		II
Spotted owlet	Athene brama	10	LC	LC		II
Indian scops-owl	Otus bakkamoena	10	LC	LC		II
Short-eared owl	Asio flammeus	4	LC	VU		II
Rock eagle-owl	Bubo bengalensis	7	LC	VU		II
Spot-bellied eagle-owl	Bubo nipalensis	10	LC	EN		II
Brown fish-owl	Ketupa zeylonensis	10	LC	VU		II
Osprey	Pandion haliaetus	1	LC	LC		II
Oriental honey-buzzard	Pernis ptilorhynchus	10	LC	LC		II
Black baza	Aviceda leuphotes	10	LC	NT		II
Crested serpent-eagle	Spilornis cheela	10	LC	LC		II
Egyptian vulture	Neophron percnopterus	10	EN	VU		II
Red-headed vulture	Sarcogyps calvus	10	CR	EN	X	II
Himalayan griffon	Gyps himalayensis	10	NT	VU		II
White-rumped vulture	Gyps hengalensis	10	CR	CR	X	II
Slender-billed vulture	Gyps tenuirostris	10	CR	CR		II
Griffon vulture	Gyps tenuirostris Gyps fulvus	10	LC	DD	X	II
		10	NT	EN		II
Cinoroous multuro		10	IN I	EIN		
Cinereous vulture	Aegypius monachus		NITT	IC		11
Mountain hawk-eagle	Nisaetus nipalensis	10	NT	LC		II
Mountain hawk-eagle Changeable hawk-eagle	Nisaetus nipalensis Nisaetus cirrhatus	10 6	LC	LC		II
Mountain hawk-eagle Changeable hawk-eagle Greater spotted eagle	Nisaetus nipalensis Nisaetus cirrhatus Clanga clanga	10 6 10	LC VU	LC VU		II
Mountain hawk-eagle Changeable hawk-eagle Greater spotted eagle Steppe eagle	Nisaetus nipalensis Nisaetus cirrhatus Clanga clanga Aquila nipalensis	10 6 10 10	LC VU EN	LC VU VU		II II
Mountain hawk-eagle Changeable hawk-eagle Greater spotted eagle	Nisaetus nipalensis Nisaetus cirrhatus Clanga clanga	10 6 10	LC VU	LC VU		II

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Western marsh-harrier	Circus aeruginosus	10	LC LC	VU		II
Hen harrier	Circus cyaneus	10		VU		II
Pied harrier	Circus melanoleucos	10	LC	VU LC		II
Crested goshawk	Accipiter trivirgatus	4	LC			II
Shikra	Accipiter badius	10	LC	LC		II
Besra	Accipiter virgatus	6	LC	LC		II
Eurasian sparrowhawk	Accipiter nisus	10	LC	LC		II
Grey-headed fish-eagle	Icthyophaga ichthyaetus	10	NT	CR		II
Black kite	Milvus migrans	10	LC	LC		II
White-eyed buzzard	Butastur teesa	5	LC	LC	X	II
Himalayan buzzard	Buteo refectus	10	LC	LC		II
Long-legged buzzard	Buteo rufinus	10	LC	LC		II
Great hornbill	Buceros bicornis	7	VU	EN		I
Indian grey hornbill	Ocyceros birostris	10	LC	LC	X	
Oriental pied hornbill	Anthracoceros albirostris	10	LC	NT		II
Common hoopoe	<i>Upupa epops</i>	10	LC	LC		
Blue-bearded bee-eater	Nyctyornis athertoni	10	LC	LC		
Asian green bee-eater	Merops orientalis	10	LC	LC		
Chestnut-headed bee-eater	Merops leschenaulti	10	LC	LC		
Blue-tailed bee-eater	Merops philippinus	10	LC	LC		
Indian roller	Coracias benghalensis	10	LC	LC		
Oriental dollarbird	Eurystomus orientalis	1	LC	LC		
Common kingfisher	Alcedo atthis	10	LC	LC		
Crested kingfisher	Megaceryle lugubris	7	LC	LC		
Pied kingfisher	Ceryle rudis	10	LC	LC		
Stork-billed kingfisher	Pelargopsis capensis	2	LC	LC		
White-breasted kingfisher	Halcyon smyrnensis	10	LC	LC		
Coppersmith barbet	Psilopogon haemacephalus	10	LC	LC		
Great barbet	Psilopogon virens	7	LC	LC		
Lineated barbet	Psilopogon lineatus	10	LC	LC	Х	
Brown-headed barbet	Psilopogon zeylanicus	10	LC	LC	Х	
Blue-throated barbet	Psilopogon asiaticus	7	LC	LC		
Eurasian wryneck	Jynx torquilla	10	LC	LC		
Greater flameback	Chrysocolaptes guttacristatus	10	LC	LC		
White-naped woodpecker	Chrysocolaptes festivus	10	LC	LC	Х	
Himalayan flameback	Dinopium shorii	10	LC	LC		
Black-rumped flameback	Dinopium benghalense	10	LC	LC	Х	
Rufous woodpecker	Micropternus brachyurus	10	LC	LC		
Greater yellownape	Chrysophlegma flavinucha	10	LC	LC		
Black-naped woodpecker	Picus guerini	10	LC	LC		
Great slaty woodpecker	Mulleripicus pulverulentus	10	VU	EN		
Grey-capped woodpecker	Picoides canicapillus	10	LC	LC		
Indian pygmy woodpecker	Picoides nanus	10	LC	LC		
Yellow-crowned woodpecker	Leiopicus mahrattensis	10	LC	LC	Х	
Fulvous-breasted woodpecker	Dendrocopos macei	10	LC	LC		
Common kestrel	Falco tinnunculus	10	LC	LC		II
Peregrine falcon	Falco peregrinus	10	LC	LC		I
Slaty-headed parakeet	Psittacula himalayana	10	LC	LC		II
Plum-headed parakeet	Psittacula cyanocephala	10	LC	LC	Х	II
Alexandrine parakeet	Paleaornis eupatria	10	NT	NT		II
Rose-ringed parakeet	Psittacula krameri	10	LC	LC		
Indian pitta	Pitta brachyura	10	LC	LC		
Black-hooded oriole	Oriolus xanthornus	10	LC	LC		
Indian golden oriole	Oriolus kundoo	10	LC	LC		
Small minivet	Pericrocotus cinnamomeus	10	LC	LC	Х	
Grey-chinned minivet	Pericrocotus solaris	10	LC LC	LC	А	
Long-tailed minivet	Pericrocotus ethologus	10	LC	LC		
Scarlet minivet	Pericrocotus etnologus Pericrocotus flammeus	10	LC LC	LC		
Indian cuckooshrike	Coracina macei	10	LC LC	LC		
mulan cuckoosiii ike	บบานบากน เกินติย	ΤÜ	FC	ьс		

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Black-winged cuckooshrike	Lalage melaschistos	10	LC	LC	
Ashy woodswallow	Artamus fuscus	2	LC	LC	X
Bar-winged flycatcher-shrike	Hemipus picatus	10	LC	LC	
Large woodshrike	Tephrodornis virgatus	10	LC	LC	
Common woodshrike	Tephrodornis pondicerianus	10	LC	LC	X
Common iora	Aegithina tiphia	10	LC	LC	
White-browed fantail	Rhipidura aureola	10	LC	LC	X
White-throated fantail	Rhipidura albicollis	10	LC	LC	
Black drongo	Dicrurus macrocercus	10	LC	LC	
Ashy drongo	Dicrurus leucophaeus	2	LC	LC	
White-bellied drongo	Dicrurus caerulescens	10	LC	LC	X
Crow-billed drongo	Dicrurus annectans	10	LC	LC	
Lesser racquet-tailed drongo	Dicrurus remifer	10	LC	LC	
Hair-crested drongo	Dicrurus hottentottus	10	LC	LC	
Greater racquet-tailed drongo	Dicrurus paradiseus	10	LC	LC	
Black-naped monarch	Hypothymis azurea	10	LC	LC	
Indian paradise-flycatcher	Terpsiphone paradisi	10	LC	LC	
Brown shrike	Lanius cristatus	10	LC	LC	
Bay-backed shrike	Lanius vittatus	10	LC	LC	
Long-tailed shrike	Lanius Schach	10	LC	LC	
Grey-backed shrike	Lanius tephronotus	10	LC	LC	
Rufous treepie	Dendrocitta vagabunda	10	LC	LC	
Red-billed blue magpie	Urocissa erythroryncha	10	LC	LC	
House crow	Corvus splendens	10	LC	LC	
Large-billed crow	Corvus macrorhynchos	10	LC	LC	
Grey-headed canary-flycatcher	Culicicapa ceylonensis	10	LC	LC	
Great tit	Parus major	10	LC	LC	
Ashy-crowned sparrow-lark	Eremopterix griseus	10	LC	LC	X
Sand lark	Alaudala raytal	10	LC	LC	Α
Oriental skylark	Alauda gulgula	10	LC	LC	
Crested lark	Galerida cristata	10	LC	NT	
Zitting cisticola	Cisticola juncidis	10	LC LC	LC	
Golden-headed cisticola					
	Cisticola exilis	10	LC	NT	
Striated prinia	Prinia crinigera	10	LC	LC	
Grey-breasted prinia	Prinia hodgsonii	10	LC	LC	
Jungle prinia	Prinia sylvatica	10	LC	LC	X
Yellow-bellied prinia	Prinia flaviventris	2	LC	NT	
Ashy prinia	Prinia socialis	10	LC	LC	X
Plain prinia	Prinia inornata	10	LC	LC	
Common tailorbird	Orthotomus sutorius	10	LC	LC	
Booted warbler	Iduna caligata	10	LC	LC	
Blyth's reed-warbler	Acrocephalus dumetorum	10	LC	LC	
Nepal house martin	Delichon nipalense	10	LC	LC	
Barn swallow	Hirundo rustica	10	LC	LC	
Red-rumped swallow	Cecropis daurica	10	LC	LC	
Asian plain martin	Riparia chinensis	10	LC	NT	
Black bulbul	Hypsipetes leucocephalus	10	LC	LC	
Black-crested bulbul	Pycnonotus flaviventris	10	LC	LC	
Red-whiskered bulbul	Pycnonotus jocosus	10	LC	LC	
Himalayan bulbul	Pycnonotus leucogenys	10	LC	LC	
Red-vented bulbul	Pycnonotus cafer	10	LC	LC	
Yellow-browed warbler	Phylloscopus inornatus	6	LC	LC	
Hume's leaf-warbler	Phylloscopus humei	10	LC	LC	
Dusky warbler	Phylloscopus fuscatus	10	LC	LC	
Siberian chiffchaff	Phylloscopus tristis	10	LC	LC	
Tickell's leaf-warbler	Phylloscopus affinis	10	LC	LC	
Whistler's warbler	Phylloscopus whistleri	6	LC	LC	
Greenish warbler	Phylloscopus trochiloides	10	LC	LC	
Lblyth's leaf-warbler	Phylloscopus reguloides	10	LC	LC	
	- 1.5 1.0000 p att 1 0g att 1 att				

Western crowned leaf-warbler	Phylloscopus occipitalis	6	LC	LC	
Grey-hooded warbler	Phylloscopus xanthoschistos	10	LC	LC	
Grey-bellied tesia	Tesia cyaniventer	6	LC	LC	
Yellow-eyed babbler	Chrysomma sinense	2	LC	NT	
Oriental white-eye	Zosterops palpebrosus	10	LC	LC	
Rusty-cheeked scimitar-babbler	Erythrogenys erythrogenys	10	LC	LC	
Pin-striped tit-babbler	Mixornis gularis	10	LC	LC	
Black-chinned babbler	Cyanoderma pyrrhops	10	LC	LC	
Puff-throated babbler	Pellorneum ruficeps	10	LC	LC	
Abbott's babbler	Malacocincla abbotti	10	LC	EN	
Jungle babbler	Turdoides striata	10	LC	LC	X
Large grey babbler	Argya malcolmi	10	LC	LC	X
Indian nuthatch	Sitta castanea	6	LC	LC	
Velvet-fronted nuthatch	Sitta frontalis	10	LC	LC	
Wallcreeper	Tichodroma muraria	10	LC	LC	
Asian pied starling	Gracupica contra	7	LC	LC	
Brahminy starling	Sturnia pagodarum	10	LC	LC	X
Chestnut-tailed starling	Sturnia malabarica	10	LC	LC	X
Common myna	Acridotheres tristis	10	LC	LC	
Jungle myna	Acridotheres fuscus	10	LC	LC	
Spot-winged starling	Saroglossa spilopterus	6	LC	LC	
Dark-sided thrush	Zoothera marginata	6	LC	VU	
Scaly thrush	Zoothera dauma	10	LC	LC	
Orange-headed thrush	Geokichla citrina	10	LC	LC	
Tickell's thrush	Turdus unicolor	10	LC	LC	
Black-throated thrush	Turdus atrogularis	6	LC	LC	
Rufous-throated thrush	Turdus ruficollis	6	LC	LC	
Oriental magpie-robin	Copsychus saularis	10	LC	LC	
Indian robin	Saxicoloides fulicatus	10	LC	LC	X
White-rumped shama	Kittacincla malabarica	10	LC	LC	A
Asian brown flycatcher	Muscicapa dauurica	4	LC	LC	
Verditer flycatcher	Eumyias thalassinus	2	LC	LC	
Pale-chinned flycatcher	Cyornis poliogenys	4	LC	LC	
Tickell's blue-flycatcher	Cyornis tickelliae	10	LC	LC	
Blue-throated blue-flycatcher	Cyornis rubeculoides	10	LC	LC	
Bluethroat	Cyanecula svecica	10	LC	LC	
Siberian rubythroat	-	10	LC	LC	
Himalayan rubythroat	Calliope calliope	2	LC LC	LC	
White-tailed blue robin	Calliope pectoralis Myiomela leucura	6	LC LC	LC	
Black-backed forktail	Enicurus immaculatus	10	LC	LC	
Blue whistling-thrush	Myophonus caeruleus Ficedula tricolor	10	LC LC	LC	
Slaty-blue flycatcher		10		LC	
Red-throated flycatcher	Ficedula albicilla	10	LC	LC	
Red-breasted flycatcher	parva	8	LC	LC	
White-capped water-redstart	Phoenicurus leucocephalus	10	LC	LC	
Plumbeous water-redstart	Phoenicurus fuliginosus	2	LC	LC	
Black redstart	Phoenicurus ochruros	10	LC	LC	
Hodgson's redstart	Phoenicurus hodgsoni	10	LC	LC	
Blue rock-thrush	Monticola solitarius	10	LC	LC	
Grey bushchat	Saxicola ferreus	10	LC	LC	
Pied bushchat	Saxicola caprata	10	LC	LC	
White-tailed stonechat	Saxicola leucurus	10	LC	NT	
Common stonechat	Saxicola torquatus	10	LC	LC	
Desert wheatear	Oenanthe deserti	7	LC	LC	
Brown rockchat	Oenanthe fusca	2	LC	LC	X
Golden-fronted leafbird	Chloropsis aurifrons	10	LC	LC	
Thick-billed flowerpecker	Dicaeum agile	10	LC	LC	
Pale-billed flowerpecker	Dicaeum erythrorhynchos	10	LC	LC	
Plain flowerpecker	Dicaeum minullum	5	LC	LC	

Fire-breasted flowerpecker	Dicaeum ignipectus	10	LC	LC
Purple sunbird	Cinnyris asiaticus	10	LC	LC
Crimson sunbird	Aethopyga siparaja	10	LC	LC
Black-breasted weaver	Ploceus benghalensis	7	LC	VU
Baya weaver	Ploceus philippinus	10	LC	NT
Red avadavat	Amandava amandava	7	LC	NT
Scaly-breasted munia	Lonchura punctulata	10	LC	LC
Tricoloured munia	Lonchura malacca	10	LC	LC
House sparrow	Passer domesticus	10	LC	LC
Eurasian tree sparrow	Passer montanus	10	LC	LC
Chestnut-shouldered bush- sparrow	Gymnoris xanthocollis	10	LC	LC
Tree pipit	Anthus trivialis	10	LC	LC
Olive-backed pipit	Anthus hodgsoni	10	LC	LC
Rosy pipit	Anthus roseatus	10	LC	LC
Richard's pipit	Anthus richardi	10	LC	LC
Paddyfield pipit	Anthus rufulus	10	LC	LC
Tawny pipit	Anthus campestris	4	LC	LC
Western yellow wagtail	Motacilla flava	11	LC	LC
Grey wagtail	Motacilla cinerea	10	LC	LC
Citrine wagtail	Motacilla citreola	2	LC	LC
White-browed wagtail	Motacilla maderaspatensis	10	LC	LC
White wagtail	Motacilla alba	10	LC	LC
Common rosefinch	Carpodacus erythrinus	10	LC	LC
Crested bunting	Emberiza lathami	10	LC	LC

Key to Appendix 2: 1, Sanjib Acharya eBird checklists, 20 January 2011, 5 and 6 June 2022. 2, Anand Chaudhary eBird checklists 2021-2023. 3, Mich Coker eBird checklist, 29 June 2017. 4, Jack H. Cox (2008). 5, Ian Hearn eBird checklist, 14 April 2021. 6, Giri, T. et al. (2023). 7, Chiranjeevi Khanal. 8, Yubin Shrestha eBird checklists, 4 and 12 December 2021. 9, Karmath Subedi eBird 11 July 2022. 10, Jyotendra Thakuri (2009a). 11, Annual Waterbird Counts, 2009-2023. IUCN status and NRDB (Nepal Red Data Book) status: CR- Critically Endangered; EN- Endangered; VU- Vulnerable; NT-Neat-threatened; LC- Least Concern; DD- Data Deficient. BRS species are characteristic species of the Indo-Malayan tropical dry zone biome