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Status of biodiversity in wetlands of Biswanath District of Assam, India

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Abstract. *Kakati R, Das N, Bhuyan A, Borah D. 2021. Status of biodiversity in wetlands of Biswanath District of Assam, India. Biodiversitas 22: 453-471.* Reports on biodiversity of a region are the firsthand data to understand the assemblage, importance, and to follow conservation inputs. The present study was aimed to document and analyze the wetland biodiversity of Biswanath District of Assam, India. Data was collected from 27 wetland habitats from 2015-2019. A total of 235 taxa were recorded, of which 79 taxa (77 species, one variety, and one subspecies) were vascular plants, 83 water birds, 47 fishes, 7 amphibians, 18 reptiles, and 2 mammals. None of the plants and amphibians fall under any of the threatened categories as per IUCN Red List 2020. However, among the bird species, 2 species are assessed as endangered, 4 species as vulnerable, and 10 species as near threatened. Among the fishes, 2 are vulnerable and 3 near threatened. Among the reptiles one is extinct in the wild (EW), 3 endangered and 3 are vulnerable. Along with the checklist of the present biodiversity, past and present population trends, as well as earlier records from Assam of the threatened species, and near threatened species is provided. The results of this study can be used by stakeholders for species identification and as the baseline taxonomic account for future studies on the conservation of these wetland species in a global context.

Keywords: Assam, checklist, conservation, threatened, taxonomy, wetland

Abbreviation: EW: Extinct in Wild, CR: Critically Endangered, EN: Endangered, VU: Vulnerable, NT: Near threatened, LC: Least concern, NE: Not evaluated, C: common (frequency of sighting was 75% out of the total visits in its respective habitats throughout the year or during their season of occurrence), O: occasional (frequency of sighting was 50-75% out of the total visits in its respective habitats throughout the year or during their season of occurrence), U: uncommon (frequency of sighting was 25-50% out of the total visits in its respective habitats throughout the year or during their season of occurrence), S: stray (frequency of sighting was less than 25% out of the total visits in its respective habitats throughout the year or during their season of occurrence), R: Widespread resident, r: Very local resident, W: Widespread winter visitor, w: Sparse winter visitor, s: Local summer breeder

INTRODUCTION

Wetlands are defined as transitional land between terrestrial and aquatic ecosystems where the water body is usually at or near the surface, or the land is covered by shallow water (Mitsch and Gosselink 1986). They are considered as one of the most productive ecosystems, providing a multitude of benefits to diverse forms of life (Sarma and Borah 2014). Apart from their critical role in maintaining human welfare, they also play important roles in the hydrological cycle and biodiversity conservation (Ramsar Convention Secretariat 2007). It also comprises about 40% of the existing plant and animal diversity (Zedler and Kercher 2005).

In India, wetlands have been used for recreational, religious, aesthetic, and economic uses (Prasad et al. 2002; Bassi and Kumar 2012). They are ecologically sensitive and adaptive systems (Turner et al. 2002) as well as support a huge diversity according to their geographical allocation, genesis, water regime, and chemistry (Space Applications Centre 2011). During dry periods they help to reserve water, thus keeping the water table high and relatively stable. During periods of flooding, they mitigate flood and trap suspended solids, and attached nutrients (Prasad et al. 2002).

According to Article 1.1 of the Ramsar Convention, a total number of 2165 Ramsar sites are identified globally and 27 of them are in India (Ramsar Secretariat 2013). As, per the Directory of Indian Wetlands (WWF and AWB 1993), about 67,420 numbers of small and large size wetlands are spread over 40,40,087 hectares of the country's landmass (Kumar et al. 2019). Northeast India, including Assam valley and adjacent hill ranges, exhibits a complex mosaic of vegetation types ranging from northern tropical wet evergreen to montane wet temperate types (Champion and Seth 1968). Located at the heart of Northeast India, the state of Assam has a different set of physiographical conditions from its surrounding regions and represents a diverse range of plant communities (Borah et al. 2020b). It has a geographical area of 7.84 million hectares which constitutes 2.39% of the country's total area. It is dominated by the Brahmaputra river which is around 2900 km in length and occupies a drainage area of about 9,35,500 sq. km (Islam and Rahmani 2004) forming several wetlands in all the corners of the state. In the present scenario agriculture, mining, municipal waste deposition, industrial waste drainage, constructions of roads, and other structures are the major threats to the wetland biodiversity of Assam as well as India.

Biswanath District of Assam, India is very diverse in wetlands as is a part of the Brahmaputra-Kaziranga flood plains. Hence the area has several un-drained depressions: ox-bow lakes, swamps, permanent rivulets, etc. These are characterized under swamp forests and the dominant plants include *Hygrorhiza aristata*, *Barringtonia acutangula*, *Phragmites karka*, etc. (Kanjilal et al. 1934-1940). A very few numbers of works have been so far conducted in Biswanath District of Assam (Sarma et al. 2009a; Borah et al. 2018; 2019a,b; 2020a,b,c,d; 2021) and a single study by Barooah and Mahanta (2006) aimed to present the wetland flora of the region. In this present study, we aim to record the whole wetland biodiversity of Biswanath, Assam including both the floral and faunal elements.

MATERIALS AND METHODS

Study area

The study was conducted in the Biswanath District of Assam, India which is spread across the foothills of Eastern Himalaya (Islam and Rahmani 2004). The district encompasses two major forested areas, Kaziranga National Park in the southern boundary as well as Behali Reserve Forest on its northern boundary. It is bounded by the hilly terrains of Arunachal Pradesh, India on the north, alluvial plains of Nagaon and Golaghat districts on the south, east by Lakhimpur district and Sonitpur district on the west. The total human population is around 6,12,400 individuals (Govt. of Assam 2011) belonging to different ethnic communities like Chutiya, Kalita, Nepali, Bengali, Munda, Bodo, Mishing, Karbi, etc. comprising the entire Assamese community (Saikia 2017). The total area of the region is about 1,100 sq. km and the elevation ranges between 65-350 m asl. (Gogoi et al. 2020). It is a part of the flood plains of the river Brahmaputra, which traverses throughout the district and the soil type is mainly alluvial (Gogoi et al. 2020). The climate of the area is a humid subtropical type with an average temperature of 6°C to 34°C (Islam and Rahmani 2004) and the average rainfall is 2000 mm (Neog and Bordoloi 2016-2017).

Data collection

A total of 27 wetland habitats have been studied (Table 1, Figure 1), from 2015-2019. They were purposely selected for the assessment of total flora and faunal species.

The plant species were collected randomly following the methods of Jain and Rao (1977). The voucher specimens were later identified using different literature (Kanjilal et al. 1934-1940; Hooker 1872-1897) and matched at ARUN and ASSAM Herbaria. The specimens will be finally deposited in the Herbarium of Goalpara College, Department of Botany, Assam for future references. The correct nomenclature is updated using POWO (2019).

For the avifaunal species, data collection was carried out by walking (about 1-1.5km/h) along the bank as well as traveling by boat (Gaston 1975; Bibby et al. 2000). All the surveys were carried out in the early morning (05:30 am-08:30 am) and early evening (03:00 pm-6:00 pm) to correlate with birds' peak activity (Fisher and Hicks 2006). Nikon ACULON (a211-10-22x50) binoculars were used and each observation took 15 to 20 minutes. Birds were counted thoroughly and it was ensured that the same birds were not counted repeatedly. They were then identified by their photographs, primary song, and sight using Inskipp and Inskipp (1991), and Gill and Wright (2006), Grimmett et al. (2011). The residential status of the birds are classified as per Grewal and Bhatia (2014) and the vernacular names of the bird species were provided following Das and Mukherjee (1974) and Datta (2013).

Fishes were collected with the help of the local fisherman who used different kinds of fishing nets, traps, and local fishing techniques (Vishwanath 2017). The specimen were identified based on morphometric and anatomical studies, using Talwar and Jhingran (1991) and Vishwanath (2017).

Reptiles and amphibians were observed by visual encounter survey (Crump and Scott 1994), randomized walk (Lambert 1984), active searching (Rolfe and McKenzie 2000), and Pitfall trap (Heyer et al. 1994). Stream transects of 50 x 2 m were laid randomly around the wetlands (Dutta et al. 2013). The specimen were later identified through Ahmed et al. (2009), Mathew and Sen (2010), Purkayastha (2013), and Saikia and Kharkongor (2017).

Table 1. Sites of data collection within Biswanath District of Assam, India

Site no.	Plots	Coordinates	Alt. (masl.)
1a	Rowmari	N 26°39'39.07"; E 92°57'11.07"	68
1b	Kari	N 26°39'08.17"; E 92°56'32.38"	67
1c	Hokoma	N 26°42'30.16"; E 92°55'37.12"	70
2a	Nagshankar	N 26°43'29.05"; E 92°59'39.46"	76
2b	Shildubi	N 26°40'34.36"; E 92°57'30.37"	67
2c	Sukanpukhuri	N 26°44'30.04"; E 92°57'47.13"	76
3a	Kodomoni	N 26°42'44.16"; E 93°07'29.03"	69
3b	Ogota	N 26°42'26.18"; E 93°07'04.77"	66
3c	Kaori	N 26°41'20.63"; E 93° 1'52.54"	68
4a	Kalidubi	N 26°45'16.6"; E 93°16'31.9"	82
4b	Dhondi	N 26°51'02.71"; E 93°42'39.81"	74
4c	Kharoi	N 26°50'46.12"; E 93°40'31.92"	76
5a	Kothaichuk	N 26°49'50.59"; E 93°32'50.26"	80
5b	Pavoigreen	N 26°48'57.06"; E 93°09'10.53"	87
5c	Biswanath Ghat	N 26°39'38.20" E 93°10'50.06"	70
6a	Behali RF	N 26°53'54.34"; E 93°15'06.41"	110
6b	Kuwori	N 26°46'18.67"; E 93°08'19.74"	83
6c	Borigaon	N 26°45'04.75"; E 92°57'41.53"	73
7a	Dhenudhara	N 26°40'20.38"; E 93°09'39.19"	80
7b	Gerekijan	N 26°44'31.00"; E 93°03'40.00"	75
7c	Chaiduar college	N 26°52'45.35"; E93°36'20.99"	80
8a	Burigang	N 26°44'34.98"; E 93°10'35.66"	78
8b	Lehugaon	N 26°45'14.26"; E93° 9'15.51"	79
8c	Botiamari	N 26°46'54.00"; E93°26'11.84"	78
9a	Bamgaon	N 26°44'25.52"; E 93° 9'53.47"	79
9b	Kalyani Temple	N 26°47'34.58"; E 93°31'26.70"	68
9c	Gangmou	N 26°45'47.28"; E 93°19'27.22"	66

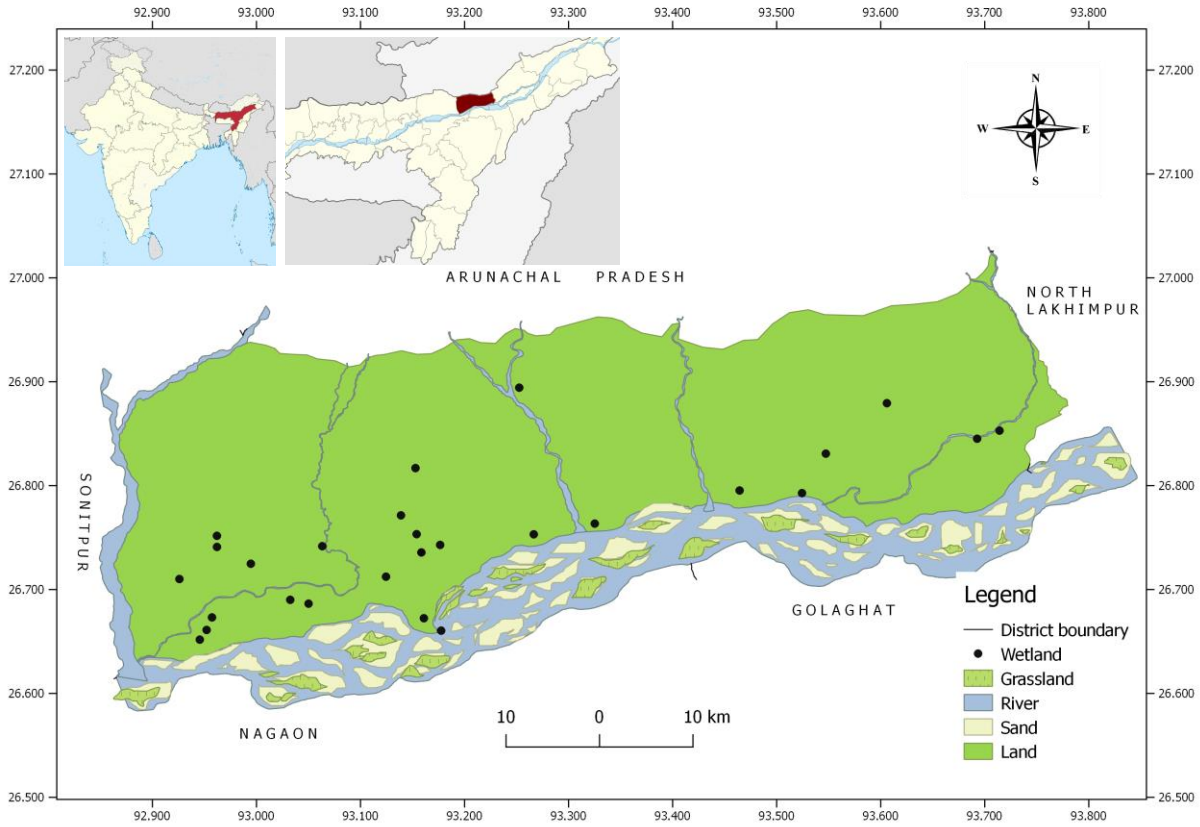

Figure 1. Wetlands of Biswanath District, Assam, India (26°36' and 27°02'N; 92°58' and 93°47'E)

Turtle species data were observed by direct sighting, visual encounter survey (VES), and active searching method (Qaiser and Sharma 2016, Basumatary and Sharma 2013). Specimens were identified based on morphometric study and with the help of Ahmed et al. (2009) and Daniel (2016).

Mammal sightings were counted by direct observation and track count techniques (Khan et al. 2007). A total of 12 observation surveys of 2 hours by foot and boat were conducted (Mason and Macdonald 1986; Reuther et al. 2002).

The threat statuses of all the taxa are as per IUCN Red List (2020).

The Shannon diversity index of the faunal species was calculated for each wetland following Shannon and Weaver (1949). The floral elements were recorded randomly and hence the ecological study was avoided.

RESULTS AND DISCUSSION

A total of 79 taxa (77 species, one variety, and one subspecies) of vascular plants have been recorded falling under 60 genera and 39 families (Table 3). Linderniaceae was the dominant family with 9 species, followed by Commelinaceae (5 species) and so on. Genera wise *Bonnaya* and *Ludwigia* were the dominant ones with 3 species each. As per IUCN 2020, 14 plants are assessed and are under the least concern category, whereas the remaining 65 species were not evaluated.

A total of 156 species of faunal elements were recorded. Out of them, 83 were water birds (Table 4), 47 were fishes (Table 5), 7 were amphibians (Table 6), 18 were reptiles (Table 7), and 2 were mammals (Table 8).

Among the 83 species of wetland bird species, 2 species are assessed as endangered (EN), 4 species as vulnerable (VU), and 10 species as near threatened (NT), and 67 species as least concern (LC) as per IUCN 2020. All these species fall under 22 families, among which most of them (19 spp.) were represented by Anatidae, followed by Ardeidae (10 spp.). Concerning the residential status of these avian taxa, 38 species were migratory birds and 45 species were residential. The number recorded in the present study is comparable to Chakdar et al. (2019) from Rajiv Gandhi Orang National Park (87 spp.) and Das and Deori (2010) from Nameri National Park (73 spp.), however less than Barua and Sharma (1999) from Kaziranga National Park (134 spp.).

Among the 47 fishes, *Wallago attu* and *Cyprinus carpio* are vulnerable; *Ompokbi maculatus*, *Chitala chitala* and *Ailia coila* are near threatened and other 42 species are assessed as least concern. These species fall under 21 families and Cyprinidae with 18 spp. was the most dominant. Many of them are important decorative ornamentals, viz. *Puntius*, *Channa*, *Mystus*, *Macrognathus*, etc., and *Channa barca* is one of the high valuable fish found in the region. All these fishes were recorded earlier from Assam (Dey and Kar 1989; Kar et al. 2007,

Vishwanath 2017), but due to overfishing during the breeding season and filling of wetlands for agriculture, these species are presently facing a high risk of extinction. The number reported in the present study is however less, compared to the number reported by Ngasepam et al. (2015) from Sone beel, one of the largest wetlands of Assam (69 spp.). The larger area of Sone beel and its several inlets contributes to the reason for its high diversity. Moreover, most of the wetlands within our study area are manmade, 12 are natural and only two of them now exist without much disturbance.

Regarding the amphibians, all the species recorded in the present study are distributed throughout different parts of Assam mainly floodplain areas (Purkayastha et al. 2011; 2020; Sanghal et al. 2014), and are assessed as least concern as per IUCN 2020.

During the survey, a total of 18 reptile species were recorded of which 10 are turtles, 7 snakes, and one lizard. *Nilssonia nigricans* is already extinct in the wild (EW), three species were endangered viz., *Chitra indica*, *Pangshura sylhetensis*, and *Geoclemys hamiltonii*, two species were vulnerable viz., *Nilssonia gangeticus* and *Nilssonia hurum*; *Cyclemys gemeli* was not evaluated and others were under least concern (IUCN 2020). All turtles were found in Nagshankar Temple tank except *Chitra indica* which was observed in Botiamari wetlands. Almost all the snakes were under least concern, except *Python bivittatus* which is vulnerable. The number of amphibians and snakes reported in our study is less than Purkayastha (2020) reporting 22 species of amphibians reported from Amchang Wildlife Sanctuary), Purkayastha (2011) (28 snake species reported from Guwahati and Sahgal (2014) reporting 25 species of snakes reported from Kaziranga National Park. Considering the number of turtles, it is higher than Manipur central valley (Qaiser and Sharma 2016), reporting 5 species, but is less than Kaziranga National Park where 17 species was recorded by Basumatary and Sharma (2013) and 12 species in Rajib Gandhi Orang National Park by Deka and Saikia (2015).

A total of 10616 individuals of faunal species were recorded from 27 wetlands. Out of these, the highest, 2455 individuals were recorded from Rowmari beel and the lowest, 29 individuals were recorded from Chaiduar college tank. The Shannon diversity index ranged from 2.19 to 3.69 with species richness varying from 10 to 129 (Table 2). The highest diversity was found in Rowmari beel and the lowest diversity was found in Chaiduar college tank.

Notes on the population of threatened species

Greater adjutant stork, Leptoptilos dubius *(EN)*

Globally less than 1000 individuals of endangered Greater adjutant storks exists and is considered as the most endangered among the 20 species of storks present in the world (Birdlife International 2020). It is endemic to Nepal, Bangladesh, Myanmar, Cambodia, and Southern Vietnam and India. The Brahmaputra valley of Northeast India supports more than 80 % (600-700 individuals) of its global population (Barman 2011). According to IUCN 2007, only two potential breeding sites in the world exist, Assam (India) and Cambodia. Boragaon dumping ground area in Guwahati, India recorded the highest number (466) of individuals in a small area (Saikia and Bhattacharya, 1989a). During our survey, one individual was observed in the Hokoma tank on 12 February 2019 near Panpur, Kaziranga National Park, and another one was recorded in Rowmari beel. Habitat loss, poisoning, cutting down of nesting trees has resulted in a breeding failure and the population is in serious decline.

Earlier records from Assam: Dibru Saikhowa National Park (Islam and Rahmani 2004; Choudhary 1997), Pani Dihing Sanctuary (Saikia 1995; Rahmani et al. 1990), Majuli river island (Saikia 1995), Misamari, Sonitpur district (Saikia 1995), Burhachapori Wildlife Sanctuary (Choudhury 2000), Manas National Park (Scott 1989), Nalbari, Darrang district (Rahmani et al. 1990; Saikia 1995), Orang National Park, Darrang district (Rahmani et al. 1990; Changkakati and Das 1991), Kaziranga National Park (Scott 1989), Chakrashila Wildlife Sanctuary, Pabitora Wildlife Sanctuary (Choudhury 2000), Deepor Beel (Saikia and Bhattacharya 1989b; Barman et al. 1995), Sonapur, Nagaon (Saikia 1995), Bordoibam Bilmukh Sanctuary (Choudhury 2000), Laokhowa Wildlife Sanctuary (Rahmani et al. 1990; Choudhury 2000), Morigaon district (Saikia 1995), Nagaon and Sivasagar district (Changkakati and Das 1991; Choudhury 1993), Jhanjimuk-Kokilamukh, Jorhat (Mahanta et al. 2019).

Pallas's fish eagle, Haliaeetus leucoryphus *(EN)*

Pallas's fish eagle is a globally vulnerable species (Birdlife International 2020). It breeds in Central Asia between the Caspian and Yellow Seas, from Kazakhstan to Mongolia, China, and South to the Himalayas, Northern India, and Bangladesh. The main breeding populations are in China, Mongolia, and South Asia. The population is decreasing in China, Pakistan, India, Nepal, Bhutan, Myanmar, and Bangladesh due to habitat loss and climate change. The total population is likely to be less than 10,000 individuals (Birdlife International 2001) and in Asia, it is estimated about 2,500-9,999 mature adults (Birdlife International 2015). Assam hosts around 882 individuals (Ebird 2020). Only one individual was observed during the present survey on a tree near Karibeel, Kaziranga National Park Sixth edition.

Table 2. Shannon_H diversity index of faunal communities in different wetlands of Biswanath, Assam, India

Wetland	1a	1b	1c	2a	2b	2c	3a	3b	3c
Shannon_H	3.69	3.29	3.00	3.12	3.68	3.40	3.35	3.38	3.11
Wetland	4a	4b	4c	5a	5b	5c	6a	6b	6c
Shannon_H	3.55	3.56	2.97	3.31	3.14	2.96	3.46	3.17	3.48
Wetland	7a	7b	7c	8a	8b	8c	9a	9b	9c
Shannon_H	3.44	3.52	2.20	2.25	2.23	2.97	2.34	3.07	2.48

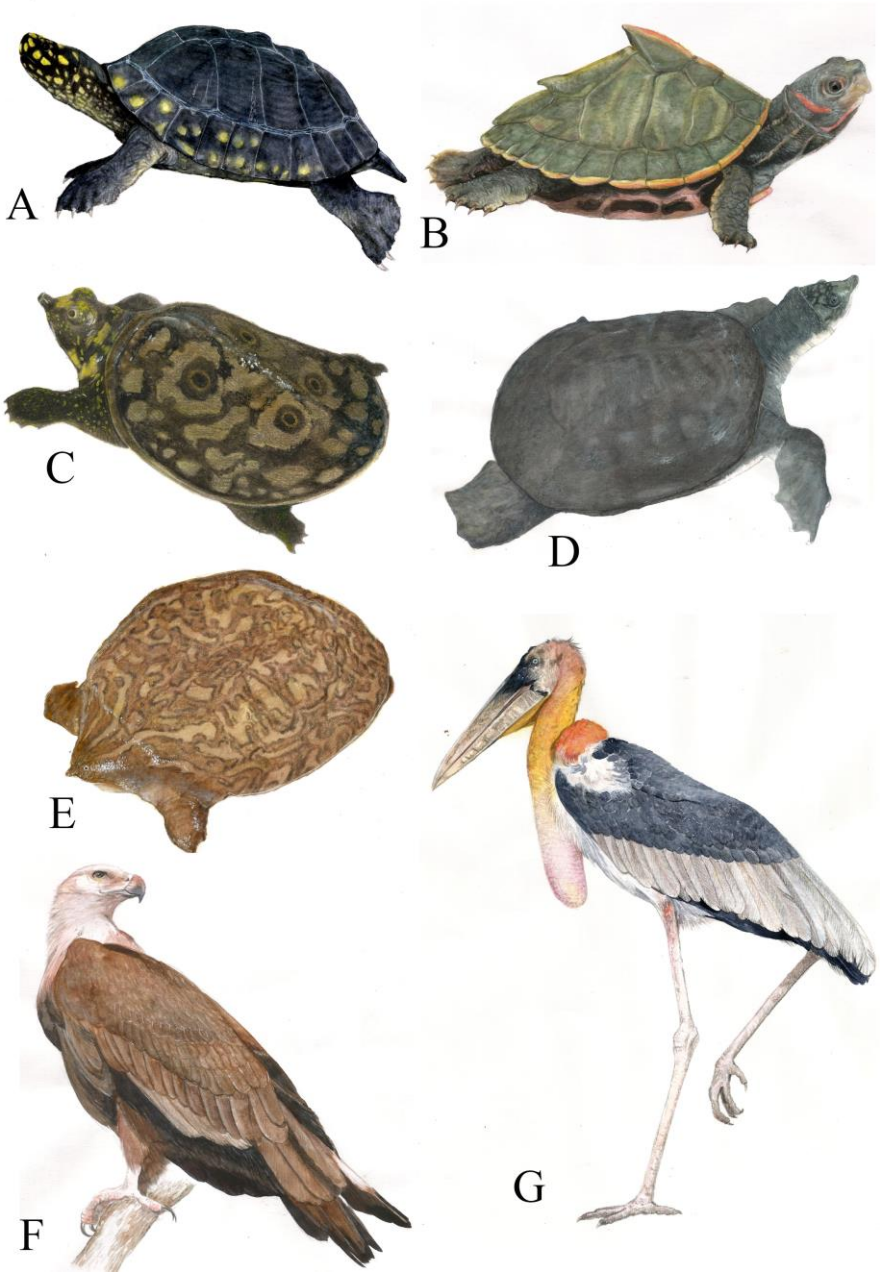

Figure 2. Illustrations of the endangered species of Biswanath, Assam, India: A. *Geoclemys hamiltonii*, B. *Pangshura sylhetensis*, C. *Nilssonia nigricans*, juvenile, D. *Nilssonia nigricans*, adult, E. *Chitra indica*, F. *Haliaeetus leucoryphus*, G. *Leptoptilos dubius*

Earlier records from Assam: Dibru-saikhowa National Park (Choudhury 2000; Islam and Rahmani 2004), Pani Dihing (Choudhury 1991; 2000), Nameri National Park (Talukdar and Das 1997), Manas National Park (Rahmani et al. 1988; Choudhury 2000), Kaziranga National Park (Samant et al. 1995; Barua and Sharma 1999), Deepor Beel (Barman et al. 1995; Choudhury 2000).

Swamp francolin, Francolinus gularis *(VU)*

Swamp francolin is distributed in the low-lying Terai belt that lies between the Himalayan foothills to the north and the Indo-Gangetic plains to the south, covering India, Bangladesh, and Nepal (Rahmani and Qamar 1993; Ali and Ripley 2007; McGowan et al. 1994, 1995; Javed et al. 1999; Shakya et al. 2001). They were recorded in 12 sites covering the entire Terai and Brahmaputra flood plains by Javed et al. (1999): 7 sites from Uttar Pradesh, 4 from Assam and one from Bihar. During our survey, two flocks were observed in wet alluvial grasslands on the bank of Rowmari-beel of Kaziranga national park and swamps of Behali Reserve Forest. Transformation of its habitat into agricultural land, hunting and trapping, and use of agricultural pesticides are the main threats to this species.

Earlier records from Assam: Kaziranga National Park (Baruah and Sharma 1999), Dibru-Saikhowa National Park (Choudhury 2006), Orang National Park (Chakdar et al. 2019), Jhanjimuk-Kokilamukh, Jorhat (Mahanta et al. 2019).

Common pochard, Aythya farina *(VU)*

Common Pochard is a rare winter visitor to Assam. The total global population is estimated to be 22,00,000-25,00,000 individuals (BirdLife International 2020) and was earlier categorized as Least Concern, but reassessed as Vulnerable (IUCN, 2020). It is very rarely sighted in Assam, only in wetlands of three protected areas, so far: Kaziranga National Park, Orang National Park, and Dibru-Saikhowa National Park. The breeding range of this species spans across the temperate zones of Eurasia, South East Russia, and North China. It is also an irregular visitor to southern India (Ali and Ripley 2007; Rasmussen and Anderton 2005; Rahmani and Islam 2008; BirdLife International 2013). We recorded 19 individuals of this species in Rowmari-beel.

Earlier records from Assam: Kaziranga National park (Baruah and Sharma 1999), Orang National Park (Chakdar et al. 2019, Talukdar and Sharma 1995), Dibru Saikhowa National Park (Choudhury 2006), Jhanjimuk-Kokilamukh, Jorhat (Mahanta et al. 2019)

Lesser adjutant stork, Leptoptilos javanicus *(VU)*

Around 6,500-8,000 mature individuals of the lesser adjutant stork are left in the world. They are distributed in Cambodia, India, Malaysia, Nepal, Indonesia, Sri Lanka, Bangladesh, Myanmar, Laos, Bhutan, Brunei, Vietnam and Thailand (BirdLife International 2013). Cutting down their nesting trees, habitat destruction and the use of fertilizers and pesticides in agricultural land are threatening the survival of this species. A total of 47 individuals were observed in different sites during the study. Many nesting sites were also found within urban-scapes and near roadsides. The preferable species for hosting nests observed in the study were *Bombax ceiba*, *Alstonia scholaris*, and *Carallia brachiata*. But occasionally nests are also observed on *Aegle marmelos* and *Mangifera indica*.

Earlier records from Assam: Biswanath District (Chaudhury 2000), Dibru Saikhowa National Park (Islam and Rahmani 2004; Saikia 1995), Dum Duma (Saikia 1995), Jamjing beel (Choudhury 1992), Pani Dihing (Saikia 1995), Nameri National Park (Choudhury 1991), Majuli Island (Saikia 1995), Dikhoumukh (Saikia 1995), Borajan (Choudhury 1995), Manas National Park (Rahmani et al. 1988; Saikia 1995), Orang National Park (Saikia 1995), Kaziranga National park (Saikia 1995; Baruah and Sharma 1999), Laokhowa Wildlife Sanctuary (Kahl 1971; Saikia 1995), Nalbari (Saikia 1995), Chakrashilla Wildlife Sanctuary, Sareswar beel (Saikia 1995), Jengdia beel, Kamrup district (Saikia 1995), Pabitora Wildlife Sanctuary (Saikia 1995), Deepor beel (Saikia and Bhattacharya 1989; Barman et al. 1995), Jhanjimuk-Kokilamukh, Jorhat (Mahanta et al. 2019).

Woolly-necked stork, Ciconiaepis copus *(VU)*

It is a widespread tropical species breeding in Asia and Africa. They build their nest generally on tall trees located near agricultural lands or wetlands (Hancock 1992; Choudhary 2013; Rahmani 1996). Nesting in mobile towers in Pune is also been reported (Vaghela et al. 2015). This species is also recorded from higher elevation areas above 3,790 m i.e. Napahai wetland, China (Burnham 2012), and from Annapurna Conservation Area, Nepal above 3,540 m (Ghale 2018). Generally found in small flocks, we observed 7 individuals in Rowmari-beel, 3 individuals in Kodomoni, and 2 individuals in Botiamari. A nesting site was also observed in Nagshankar, Biswanath which was recently felt down for road extension. As so far only a single nest was observed and it represents the direct threat humans are posing.

Earlier records from Assam: Dibru-saikhowa National Park (Choudhury 2006); Orang National Park (Chakdar et al. 2019), Kaziranga National Park (Baruah and Sharma 1999), Jhanjimuk-Kokilamukh, Jorhat (Mahanta et al. 2019), Nameri National Park (Das and Deori 2010).

Wallago catfish, Wallago attu *(VU)*

It is widely distributed in large parts of South and Southeast Asia. However, it is an example of a species with a discontinuous distribution (Roberts, 1982). The rivers of Assam: Brahmaputra, Barak, its tributaries, and many more wetlands and rivers are very good habitat for this species. We recorded this species from many wetlands namely Rowmari-beel, Kari-beel, Hokoma-beel, Shildubi-beel, Biswanath Ghat, Kodomoni-beel, Ogota-beel, Kawri-beel, Dhondi-beel, Kharoi, Kothaichuk, Pavoi green, Borigaon, Dhenudhara, Gereki-jaan, and Kalyani Temple tank.

Earlier records from Assam: Sone beel (Ngasepam et al. 2015), Kulsi River (Islam et al. 2013), an unspecified locality within Assam (Goswami et al. 2012; Goswami and Zade 2015; Baro et al. 2014; Das and Biswas 2009; Goswami et al. 2007; Talwar and Jhingran 1991; Sarmah et al. 2004).

Common carp, Cyprinus carpio *(VU)*

It is a widely distributed freshwater species found in Europe and Asia. This species was recorded from Rowmari beel, Pavoi greens, Kuwori pukhuri, and Dhondi beel.

Earlier records from Assam: Sone beel (Ngasepam et al. 2015), Kulsi River (Islam et al. 2013), an unspecified locality within Assam (Goswami et al. 2012; Goswami and Zade 2015; Baro et al. 2014; Das and Biswas 2009; Goswami et al. 2007; Talwar and Jhingran 1991; Sarmah et al. 2004).

Black softshell turtle, Nilssonia nigricans *(EW)*

The black softshell turtle is distributed throughout Asia, Africa, and New Guinea (Fritz and Peter 2007). In the year, 2002 it has been declared extinct in wild (IUCN 2002). And, presently can only be observed in some ex-situ conservation sites of the Brahmaputra basin and some of the temples of Bangladesh, such as Bayazid bostami shrine and Chittagong (Meylan 1987; Das et al. 2018). During our study, we found 34 individuals (20 mature individuals and recently 14 new hatchlings) of Black softshell turtle in Nagshankar which hosts a good population in a small pond compared to the other known localities.

Earlier records from Assam: Nagshankar temple tank (Kakati and Tamuli 2019), Mihi-beel, Kaziranga National Park (Basumatary and Sharma 2013; Sanghal 2014),

Biswanath Ghat (Praschag and Gemel 2002), Rangamatia-beel (Agaratoli), Diffolu River at Diffolumukh camp, Sapekhati beel (near Gendarmari camp) and Bhengrai nullah (near Rongamatia camp) (Ahmed and Das 2009), Kamakhya Temple Pond, Nagshankar Pond, Dibrugarh, Tinsukia, Biswanath Ghat, Nameri National Park, Nazira (Prachag and Gemel 2002).

Narrow-headed softshell turtle, Chitra indica *(EN)*

It is distributed throughout South Asia, on the banks of rivers such as Brahmaputra, Indus, Ganga, Godavari, Jamuna, Meghna, Dholeswar, Coleroon, Mahanadi, and Padma in India, Bangladesh, Pakistan and Nepal and its connected wetlands (Das 1995; Choudhury 1990; Dutta 1997; Mirza and Ali 1972; Khan 2006; Akbar et al. 2006; Khan 1987; Rashid 1991; Rashid and Swingland 1997). During our study, one individual was recorded in Botiamari entangled in a fisherman's net.

Earlier records from Assam: Bhaisamari-beel (Basumatary and Sharma 2013), Debeswari, Arimora and Agaratoli, Kaziranga National Park (Ahmed and Das 2009; Sanghal 2014), Orang National Park (Deka and Saikia 2015), Fakirganj ferry Ghat, Dhubri (Datta 1997). Dibru Saikhowa National Park (Choudhury 1995), Kaziranga NP (Bhupathy et al. 1999; Choudhury 2004), Nameri National Park (Bhupathy et al. 1999).

Assam roofed turtle, Pangshura sylhetensis *(EN)*

The Assam roofed turtle is endemic to North-eastern India and Bangladesh (Das et al. 2010). It is a very small freshwater turtle with a hard shell, facing a high risk of extinction. It prefers half-submerged logs inclined at 10-45˚ angle, and climb up to a height of 2-3 feet from the water surface (Kakati and Tamuli 2019). 7 individuals were recorded during our study.

Earlier records from Assam: Brahmaputra, Pachnoimukh, and Marisali (Deka and Saikia 2015), Arimora, Debeswari, Kaziranga National Park (Lahkar 2000; Sanghal 2014), Biswanath Ghat (Ahmed and Das 2009), Nagshankar Tank (Sarmah et al. 2009; Kakati and Tamuli 2019), Kolathua village, Sibsagar District, Garo Hills, Cachar (Moll 1987), Manas National Park (Sharma 1988), Banko Beel, Dibru Saikhowa National Park, Saikhowa Ghat, Ghilamara, Dhakuakhana, Roha beel, Ranganadi, Lakhimpur district (Choudhury 1995), Kukurmara and Chandubi (Choudhury et al. 1999).

Indian softshell turtle, Nilssonia gangeticus *(VU)*

It is an Indian endemic, distributed in the Indus, Ganga, Brahmaputra, Mahanadi, Kosi, and some other rivers across Peninsular India (Das 1995). 14 individuals were recorded in Nagshankar during our study and two individuals were recorded from Botiamari.

Earlier records from Assam: Kaziranga National Park (Basumatary and Sarma 2013; Sanghal 2014), Biswanath Ghat, Brahmaputra (Ahmed and Das 2009), Orang National Park (Deka and Saikia 2015), Nagshankar (Kakati and Tamuli 2019).

Indian peacock softshell turtle, Nilssonia hurum *(VU)*

It is a large-sized freshwater soft-shell turtle found mainly in Bangladesh, India, Nepal, and Pakistan. We recorded 17 individuals from Nagshankar.

Earlier records from Assam: Orang National Park (Deka and Saikia 2015), Mihi-beel KNP, Nagshankar (Kakati and Tamuli 2019), Arimora Bor-beel, Kaziranga National Park, Biswanath Ghat (Ahmed and Das 2009), Panigaon, Lakhimpur district (Choudhury 1995), Brahmaputra Basin, North Cachar (Dutta 1998), Kaziranga NP (Choudhury 2004), Pakke Wildlife Sanctuary (Dutta 1998), Kaziranga National Park (Sanghal 2014).

Black pond turtle, Geoclemys hamiltonii *(EN)*

The black pond turtle or Indian spotted turtle is a highly threatened freshwater turtle endemic to South Asia, Pakistan (Ganges and Indus river drainage), Northeast India (Assam), and Bangladesh (Fritz et al. 2017). We recorded a single individual in Nagshankar pond temple.

Earlier records from Assam: Orang National Park (Deka and Saikia 2015), Kaziranga National Park (Basumatary and Sharma 2013).

Burmese python, Python bivittatus *(VU)*

It is one of the largest snake species distributed across Southeast Asia (Barker and Barker 2008, 2010). It is invasive in USA (Breuer and Murphy 2009-2010). We recorded three individuals, one each in Biswanath Ghat, Nagshankar, and Behali Reserve Forest.

Earlier records from Assam: Guwahati (Purkayashta et al. 2011; 2020), Kaziranga National Park (Sanghal 2014).

Smooth-coated otter, Lutrogale perspicillata *(VU)*

It is distributed throughout South and Southeast Asia (Silva et al. 2015; Ismvael 2019). Records of it in higher elevational areas of the Himalayas are also present (Medhi et al. 2014). We recorded 5 individuals in the southern part of Rowmari-beel in two concurrent observations, 3 more individuals were also recorded in the Biswanath Ghat area of the Brahmaputra River.

Earlier records from Assam: Kaziranga National Park (Choudhury 2013; Sanghal 2014).

Ganges River Dolphin, Platanista gangetica *(EN)*

Locally known as 'Sishu' or 'Xihu' or 'Sihu' in the Brahmaputra valley and 'Susu' or 'Phoo' in Barak valley of Assam is distributed in the Ganga-Brahmaputra-Meghna river systems of India, Bangladesh, and Nepal (Choudhury 1997; Moreno 2003; Nowak 1999; 2003; Kasuya and Haque 1972; Shrestha 1989; Reeves et al. 1993). It was once commonly observed in the major tributaries of Assam. However, the siltation of these rivers and hunting led to a serious decrease in its population. We recorded 3 individuals in Biswanath Ghat.

Earlier records from Assam: Brahmaputra and Barak river basin (Biswas and Boruah 2000; Singha 2000; Wakid 2005; 2006; Biswas et al. 1997; Mazumder et al. 2014; Mohan et al. 1997).

Notes on the population of near threatened species

Black-necked stork, Ephippiorhynchus asiaticus

Black-necked stork is a widely distributed species (Rahmani 1989), ranging from Pakistan, across the Indian subcontinent to China, Indonesia, and New Guinea to Australia. In India their population has been declining and is declared almost extinct in Thailand (Lekagul and Round 1991). It is found in the extreme south of Laos (Thewlis et al. 1998; Duckworth et al. 1999). Previously it was common in Cambodia but the population has drastically decreased (BirdLife International 2001). The total population of this species in South East Asia is estimated to be 1,000 individuals (Wetland International 2003). New Guinea is another refuge for the species, which supports over 1,000 individuals (BirdLife International 2004). 187 Black-necked Stork was recorded from 59 sites in 13 states across India (Maheswaram et al. 2004). The population size is decreasing in Assam. Earlier this species was known to be common in many areas of Biswanath but in the present study, only 3 individuals were observed in Rowmari-beel, one in Kodomoni and Ogota each.

Earlier records from Assam: Dibru-saikhowa National Park (Choudhury 2006), Orang National Park (Chakdar et al. 2019), Kaziranga National Park (Baruah and Sharma 1999; Raj et al. 1989), Nameri National Park (Das and Deori 2010), Jhanjimuk-Kokilamukh, Jorhat (Mahanta et al. 2019).

Black-headed ibis, Threskiornis melanocephalus

Black-headed Ibis is native to Asia (Hancock et al. 2001; Ali and Ripley 2007; BirdLife International 2020). They migrate to Japan, Korea, and Mongolia. Only a few nesting colonies are recorded in India: Gujarat (Tiwari and Rahmani 1998), Rajasthan (Chaudhury and Koli 2018), and Kerala (Balakrishnan and Thomas 2004; Narayanan et al 2006). Nine individuals of this species were seen in agricultural fields near Rowmari beel.

Earlier records from Assam: Kaziranga National Park (Sarma and Barua 1999), Jhanjimuk-Kokilamukh, Jorhat (Mahanta et al. 2019).

Spot-billed pelican, Pelecanus philippensis

Spot-billed pelican is the most threatened species among the seven species of Pelicans. The total number of this species is about 2,500-5,000 individuals in South Asia, 3,000-5,000 individuals in South East Asia and <25 individuals in Sumatra (BirdLife International 2001, Wetlands International 2006). During the waterfowl census of 1990, a total of 2236 individuals were recorded from Assam (Das 1991). We recorded 11 individuals of this species in Rowmari beel.

Earlier records from Assam: Orang National Park (Chakdar et al. 2019), Kaziranga National Park (Sarma and Barua 1999), Dibru-Saikhowa National Park (Choudhury 2006), Jhanjimuk-Kokilamukh, Jorhat (Mahanta et al. 2019).

Oriental darter, Anhinga melanogaster

It is distributed in Southeast Asia including India. Till the year, 2000 it was a lower risk species, but in 2004 it was declared as a near-threatened species. Day by day their population is decreasing due to habitat loss and the construction of dams. The total estimated population of this species is about 22,000 mature individuals (BirdLife International 2020). We recorded 91 individuals in Rowmari beel, Kodomoni beel, Ogota beel, Dhondi beel, and Kuwri tank.

Earlier records from Assam: Orang National Park (Chakdar et al. 2019), Dibru-Saikhowa National Park (Choudhury 2006), Kaziranga National Park (Sarma and Barua 1999), Nameri National Park (Das and Deori 2010), Jhanjimuk-Kokilamukh, Jorhat (Mahanta et al. 2019).

Ferruginous pochard, Aythya nyroca

Ferruginous pochard breeding range is mainly in central and eastern Europe and South-western Asia. The total global population of this species is about 49,000 individuals and the species is considered to be globally threatened. The main four largest population is found in the West Mediterranean and North Africa (Hagemeijer and Blair 1997; Krivenko et al. 1994; Scott and Rose 1997; Snow and Perrins 1998). We recorded 88 individuals in Rowmari Beel, 16 individuals in Kodomoni beel, 4 individuals in Ogota beel, and 90 individuals in Dhondi beel.

Earlier records from Assam: Orang National Park (Chakdar et al. 2019), Kaziranga National Park (Sarma and Barua 1999), Dibru-Saikhowa National Park (Choudhury 2006), Jhanjimuk-Kokilamukh, Jorhat (Mahanta et al. 2019).

Grey-headed fish eagle, Haliaeetus icthyaetus

A total of 10,000-1,00,000 individuals is present globally and is gradually decreasing (BirdLife International 2020). The distribution of this species ranges from Nepal to Southeast Asia including Northeast India (Ferguson-Lees and Christie 2001). The main threats to this species include deforestation, the use of pesticides, and other anthropogenic activities (BirdLife International 2001). We recorded two individuals in Rowmari-beel, a single individual in Kodomoni-beel on *Bombax ceiba* with a single nest. One more was recorded in Dhondi-beel.

Earlier records from Assam: Orang National Park (Chakdar et al. 2019), Kaziranga National Park (Sarma and Barua 1999), Dibru-Saikhowa National Park (Choudhury 2006), Jhanjimuk-Kokilamukh, Jorhat (Mahanta et al.2019).

River lapwing, Vanellus duvaucelli

According to Birdlife International (2020), the total population of River lapwing is about 10000-19999. The distribution of this species ranges from Northern and Southern India, Nepal, Bhutan, Bangladesh, and Myanmar to Indochina (Ali 2002). The population size is gradually decreasing pushing it to a near-threatened species (BirdLife International, 2001). Hunting, deforestation, and the collection of its eggs from the wild are the main threats to this species. We recorded two individuals in Gerekijan wetland and two individuals in Biswanath Ghat.

Earlier records from Assam: Orang National Park (Chakdar et al. 2019), Nameri National Park (Das and Deori 2010), Dibru-Saikhowa National Park (Choudhury 2006), Kaziranga National Park (Sarma and Barua 1999), Jhanjimuk-Kokilamukh, Jorhat (Mahanta et al. 2019).

Northern lapwing, Vanellus vanellus

It is a migratory species distributed in South and North Africa, Northern India, Pakistan, China, North America, and Canada (Godfrey and Earl 1986). We recorded 21 individuals in Rowmari Beel, a single individual in Kawri Beel, and about 40-45 individuals in Botiamari.

Earlier records from Assam: Orang National Park (Chakdar et al. 2019), Nameri National Park (Das and Deori 2010), Dibru-Saikhowa National Park (Choudhury 2006), Kaziranga National Park (Sarma and Barua 1999), Jhanjimuk-Kokilamukh, Jorhat (Mahanta et al. 2019).

Great thick-knee, Esacus recurvirostris

It is distributed throughout southern Asia from India, Pakistan, Sri Lanka, and Bangladesh to Southeast Asia. We recorded a single individual in Umatumoni, Biswanath Ghat on the bank of the river Brahmaputra.

Earlier records from Assam: Orang National Park (Chakdar et al. 2019), Kaziranga National Park (Sarma and Barua 1999), Dibru-Saikhowa National Park (Choudhury 2006), Jhanjimuk-Kokilamukh, Jorhat (Mahanta et al. 2019).

River tern, Sterna aurantia

It is distributed throughout southern Asia from India, Pakistan, Sri Lanka, and Bangladesh to Southeast Asia. It is a resident breeder of Iran and the Indian Subcontinent and generally prefers river banks. We recorded eight individuals in Rowmari beel.

Earlier records from Assam: Orang National Park (Chakdar et al. 2019), Dibru-Saikhowa National Park (Choudhury 2006), Kaziranga National Park (Sarma and Baruah 1999), Nameri National Park (Das and Deori 2010), Jhanjimuk-Kokilamukh, Jorhat (Mahanta et al. 2019).

Knife fish, Chitala chitala

It is mainly found in Indian rivers and wetlands such as Indus, Ganges, Brahmaputra, and Mahanadi, etc. (Froese and Pauly 2019). This is a common fish we recorded in Rowmari-beel, Kari-beel, Shildubi, Kodomoni-beel, Kawri-beel, Kalidubi, Dhondi-beel, Pavoi greens, Kuwori pukhuri, and Kalyani temple tank.

Earlier records from Assam: Sone beel (Ngasepam et al. 2015), Kulsi River (Islam et al. 2013), an unspecified locality within Assam (Goswami et al. 2012; Goswami and Zade 2015; Baro et al. 2014; Das and Biswas 2009; Goswami et al. 2007; Talwar and Jhingran 1991; Sarmah et al. 2004).

Gangetica alia, Ailia coila

Also known as Gangetic Ailia, it is a species of catfish native to India, Bangladesh, Nepal, and Pakistan (Froese and Pauly 2019). We recorded it from Kalidubi, Dhondi-beel, and Kalyani temple tank.

Earlier records from Assam: Sone beel (Ngasepam et al. 2015), Kulsi River (Islam et al. 2013), an unspecified locality within Assam (Goswami et al. 2012; Goswami and Zade 2015; Baro et al. 2014; Das and Biswas 2009; Goswami et al. 2007; Talwar and Jhingran 1991; Sarmah et al. 2004).

Butter catfish, Ompok bimaculatus

It is widely distributed in Southeast Asia (Ferraris and Carl 2007; Froese and Pauly 2019). Earlier it was common in Assam but now their population is decreasing gradually. We recorded from 4 sites, namely Rowmari-beel, Ogota-beel, Dhondi-beel, and Biswanath Ghat.

Earlier records from Assam: Sone beel (Ngasepam et al. 2015), Kulsi River (Islam et al. 2013), an unspecified locality within Assam (Goswami et al. 2012; Goswami and Zade 2015; Baro et al. 2014; Das and Biswas 2009; Goswami et al. 2007; Talwar and Jhingran 1991; Sarmah et al. 2004).

During our study, we also observed three other species (White-winged duck, *Cairina scutulata*, EN; Falcated duck, *Anas falcata*, NT and Blyth's kingfisher, *Alcedo hercules*, NT), but as we could not gather any record shots and are based on single observations, hence are not enumerated in the checklist. Kakati and Tamuli (2019) have erroneously reported *Cyclemys gemeli* as *Cyclemys dentata* from Nagshankar Temple tank.

Table 3. List of flowering plants recorded in wetlands of Biswanath, Assam, India

Family	Taxon	IUCN Threat status	Collection number
Acanthaceae	*Hygrophila phlomoides* Nees	NE	DB 012
Acanthaceae	*Hygrophila polysperma* (Roxb.) T.Anderson	NE	DB 013
Alismataceae	*Butomopsis latifolia* (D.Don) Kunth	LC	DB 014
Alismataceae	*Sagittaria guayanensis* subsp. *lappula* (D.Don) Bogin	NE	DB 015
Amaranthaceae	*Alternanthera sessilis* (L.) R.Br. ex DC.	LC	DB 016
Amaranthaceae	*Celosia argentea* L.	NE	DB 017
Amaryllidaceae	*Crinum amoenum* Ker Gawl. ex. Roxb.	NE	DB 018
Aponogetonaceae	*Aponogeton undulatus* Roxb.	NE	DB 019
Asparagaceae	*Dracaena terniflora* Roxb.	NE	DB 020
Balsaminaceae	*Impatiens glandulifera* Royle	NE	DB 021
Boraginaceae	*Rotula aquatica* Lour.	NE	DB 022
Campanulaceae	*Lobelia zeylanica* L.	LC	DB 024

Campanulaceae	*Lobelia chinensis* Lour.	NE	DB 023
Commelinaceae	*Commelina diffusa* Burm.f.	LC	DB 026
Commelinaceae	*Commelina benghalensis* L.	NE	DB 025
Commelinaceae	*Floscopa scandens* Lour.	NE	DB 027
Commelinaceae	*Murdannia keisak* (Hassk.) Hand.-Mazz.	NE	DB 028
Commelinaceae	*Murdannia nudiflora* (L.) Brenan	NE	DB 029
Convolvulaceae	*Ipomoea aquatica* Forssk.	LC	DB 031
Convolvulaceae	*Merremia hirta* (L.) Merr	NE	DB 030
Cyperaceae	*Schoenoplectiella mucronata* (L.) J.Jung & H.K.Choi	NE	DB 032
Eriocaulaceae	*Eriocaulon brownianum* Mart.	LC	DB 033
Eriocaulaceae	*Eriocaulon nepalense* J.D.Prescott ex Bong.	NE	DB 034
Hydrocharitaceae	*Nechamandra alternifolia* (Roxb. ex Wight) Thwaites	LC	DB 037
Hydrocharitaceae	*Ottelia alismoides* (L.) Pers.	LC	DB 038
Hydrocharitaceae	*Blyxa aubertii* Rich.	NE	DB 035
Hydrocharitaceae	*Hydrilla verticillata* (L.f.) Royle	NE	DB 036
Hydroleaceae	*Hydrolea zeylanica* (L.) Vahl	NE	DB 039
Lamiaceae	*Pogostemon auricularius* (L.) Hassk.	NE	DB 040
Lamiaceae	*Pogostemon stellatus* (Lour.) Kuntze	NE	DB 041
Lauraceae	*Litsea khasyana* Meisn.	NE	DB 042
Lecythidaceae	*Barringtonia acutangula* (L.) Gaertn.	NE	DB 043
Lentibulariaceae	*Utricularia aurea* Lour.	NE	DB 044
Lentibulariaceae	*Utricularia bifida* L.	NE	DB 045
Linderniaceae	*Bonnaya antipoda* (L.) Druce	NE	DB 046
Linderniaceae	*Bonnaya ciliata* (Colsm.) Spreng.	NE	DB 047
Linderniaceae	*Bonnaya ruellioides* (Colsm.) Spreng.	NE	DB 048
Linderniaceae	*Lindernia hyssopioides* (L.) Haines	NE	DB 049
Linderniaceae	*Lindernia rotundifolia* (L.) Alston	NE	DB 050
Linderniaceae	*Torenia bicolor* Dalzell	NE	DB 051
Linderniaceae	*Torenia crustacea* (L.) Cham. & Schltdl.	NE	DB 052
Linderniaceae	*Vandellia anagallis* (Burm.f.) T.Yamaz.	NE	DB 053
Linderniaceae	*Vandellia viscosa* (Hornem.) Merr.	NE	DB 054
Lythraceae	*Ammannia baccifera* L.	LC	DB 055
Lythraceae	*Trapa natans* var. *bispinosa* (Roxb.) Makino	LC	DB 058
Lythraceae	*Lagerstroemia speciosa* (L.) Pers.	NE	DB 056
Lythraceae	*Rotala rotundifolia* (Buch.-Ham. ex Roxb.) Koehne	NE	DB 057
Malvaceae	*Hibiscus fragrans* Roxb.	NE	DB 059
Menyanthaceae	*Nymphoides hydrophylla* (Lour.) Kuntze	NE	DB 060
Menyanthaceae	*Nymphoides indica* (L.) Kuntze	NE	DB 061
Nelumbonaceae	*Nelumbo nucifera* Gaertn.	NE	DB 062
Nelumbonaceae	*Euryale ferox* Salisb.	NE	DB 063
Nelumbonaceae	*Nymphaea nouchali* Burm.f.	NE	DB 064
Onagraceae	*Ludwigia adscendens* (L.) H.Hara	NE	DB 065
Onagraceae	*Ludwigia octovalvis* (Jacq.) P.H.Raven	NE	DB 066
Onagraceae	*Ludwigia perennis* L.	NE	DB 067
Phyllanthaceae	*Phyllanthus assamicus* Müll.Arg.	NE	DB 068
Phyllanthaceae	*Phyllanthus reticulatus* Poir.	NE	DB 069
Plantaginaceae	*Dopatrium junceum* (Roxb.) Buch.-Ham. ex Benth.	LC	DB 070
Plantaginaceae	*Limnophila chinensis* (Osbeck) Merr.	NE	DB 071
Plantaginaceae	*Limnophila sessiliflora* (Vahl) Blume	NE	DB 072
Plantaginaceae	*Mecardonia procumbens* (Mill.) Small	NE	DB 073
Poaceae	*Hygroryza aristata* (Retz.) Nees ex Wight & Arn.	NE	DB 074
Poaceae	*Hymenachne amplexicaulis* (Rudge) Nees	NE	DB 075
Polygonaceae	*Persicaria strigosa* (R.Br.) Nakai	LC	DB 077
Polygonaceae	*Persicaria posumbu* (Buch.-Ham. ex D.Don) H.Gross	NE	DB 076
Polygonaceae	*Rumex dentatus* L.	NE	DB 078
Pontederiaceae	*Pontederia hastata* L.	NE	DB 079
Pontederiaceae	*Pontederia vaginalis* Burm.f.	NE	DB 080
Potamogetonaceae	*Potamogeton nodosus* Poir.	NE	DB 081
Primulaceae	*Ardisia icara* Wall. ex DC.	NE	DB 082
Ranunculaceae	*Ranunculus sceleratus* L.	NE	DB 083
Rosaceae	*Rosa sericea* Lindl.	NE	DB 084
Rubiaceae	*Dentella repens* (L.) J.R.Forst. & G.Forst.	LC	DB 085
Rubiaceae	*Oldenlandia corymbosa* L.	NE	DB 086
Sphenocleaceae	*Sphenoclea zeylanica* Gaertn.	NE	DB 087
Verbenaceae	*Phyla nodiflora* (L.) Greene	LC	DB 088
Xyridaceae	*Xyris indica* L.	NE	DB 089
Zingiberaceae	*Alpinia nigra* (Gaertn.) Burtt	NE	DB 090

Table 4. List of birds found in wetlands of Biswanath, Assam, India.

Family	English name/Vernacular name	Scientific name	Residential status	Threat status	Abundance (Location)
Anatidae	Fulvous whistling duck/Bor sorali	*Dendrocygna bicolor* (Vieillot , 1748)	r	LC	O (1a, 3a, 4a)
Anatidae	Common Shelduck/Boga Sakoi sokuwa	*Tadorna tadorna* (Linnaeus, 1758)	w	LC	S (1b)
Anatidae	Eurasian Wigeon/Kheri hah	*Anas penelope* (Linnaeus, 1758)	W	LC	S (1a)
Anatidae	Northern Shoveler/Khontiya Hah	*Anas clypeata* (Linnaeus, 1758)	W	LC	S (1a)
Anatidae	Indian Spot-billed Duck/Futuki hah	*Anas poecilorhyncha* (Forster, 1781)	R	LC	O (1a, 2b, 3a, 3c, 4a)
Anatidae	Gargeny/Kajolbulia hah	*Anas querquedula* (Linnaeus, 1758)	W	LC	O (1a, 3a, 3b, 4b, 8c)
Anatidae	Mallard/Amrolia Hah	*Anas platyrhynchos* (Linnaeus, 1758)	rW	LC	U (1a, 2b, 3a, 3c, 4a, 2c)
Anatidae	Tufted Duck/Tikoni hah	*Aythya fuligula* (Linnaeus, 1758)	W	LC	S (1a)
Anatidae	Common Pochard/Godhakoli Hah	*Aythya ferina* (Linnaeus, 1758)	W	VU	S (1a)
Anatidae	Northern Pintail/Junga Neji hah	*Anas acuta* (Linnaeus, 1758)	W	LC	U (1a, 2b, 4b)
Anatidae	Ruddy Shelduck/Sakoi-Sokuwa	*Tadorna ferruginea* (Pallas, 1764)	RW	LC	O (1a, 1b, 2b, 2c, 3a, 3c, 4a, 4b, 5c, 6c, 8c, 9c)
Anatidae	Ferruginous pochard/Borkali Hah	*Aythya nyroca* (Guldenstadt, 1770)	w	NT	U (1a, 3a, 4a, 4b)
Anatidae	Gray leg Goose/Deu-raj hah	*Anser anser* (Linnaeus, 1758)	W	LC	S (1a, 3a, 4a, 4b)
Anatidae	Bar-headed Goose/Dhritraj	*Anser indicus* (Latham, 1790)	rw	LC	U (1a, 3a, 4a, 4b, 6c, 8c,9c)
Anatidae	Cotton pygmy-goose/Kiki hah	*Nettapus coromandalianus* (Gmelin, 1789)	r	LC	S (1a, 3a, 4a, 4b, 5a)
Anatidae	Lesser whistling duck/Sorali hah	*Dendrocygna javanica* (Horsfield, 1821)	R	LC	C (1a, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 6c, 7a, 7b, 8a, 8c, 9a, 9b, 9c)
Anatidae	Red crested pochard/Ronga-muri Hah	*Netta rufina* (Pallas, 1773)	w	LC	S (1a, 3c)
Anatidae	Gadwall/Mugi Hah	*Anas strepera* (Linnaeus, 1758)	W	LC	O (1a, 3c, 4b)
Anatidae	Common Teal/Ghila hah	*Anas crecca* (Linnaeus, 1758)	W	LC	O (1a, 1b, 3c, 3b, 4a, 4b, 4c, 5a)
Podicipedidae	Great crested grebe/Bor Dubi	*Podiceps cristatus* (Linnaeus, 1758)	rw	LC	S (1a, 5c)
Podicipedidae	Little Grebe/Pani dubi	*Tachybaptus ruficollis* (Pallas, 1764)	R	LC	U (1a, 1b, 3b, 4a, 4b, 5a, 6c)
Ciconiidae	Lesser Adjutant Stork/Bortukula	*Leptoptilos javanicus* (Horsfield, 1821)	r	VU	O (1a, 1c, 3a, 3b, 3c, 4a, 5b, 5c, 6b, 6c, 8a, 9a)
Ciconiidae	Greater adjutant stork/Hargila	*Leptoptilos dubius* (Gmelin, 1789)	r	EN	S (1a, 1c)
Ciconiidae	Black stork/Kalsor	*Ciconia nigra* (Linnaeus, 1758)	w	LC	S (1a)
Ciconiidae	Asian Openbill Stork/Samuk vonga	*Anastomus oscitans* (Boddaert, 1783)	R	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b,8a, 8b, 8c,9a,9b,9c)
Ciconiidae	Woolly-necked Stork/Konuwa	*Ciconia episcopus* (Boddaert, 1783)	R	VU	O (1a, 3a, 8c, 9a)
Ciconiidae	Black-necked Stork/Telia sareng	*Ephippiorhynchus asiaticus* (Latham, 1790)	r	NT	S (1a, 3a, 4a)
Threskiornithidae	Black-headed ibis/Kola akuhi bog	*Threskiornis melanocephalus* (Latham, 1790)	R	NT	S (1a)
Threskiornithidae	Glossy ibis/Itaguriya akuhi bog	*Plegadis falcinellus* (Linnaeus, 1766)	RW	LC	S (1a, 4b)
Recurvirostridae	Black-winged stilt/Dighol thengia soha	*Himantopus himantopus* (Linnaeus, 1758)	RW	LC	S (1a)

Ardeidae	Black-crowned night heron/Wak sorai	*Nycticorax nycticorax* (Linnaeus, 1758)	R	LC	U (1a, 5a)
Ardeidae	Grey Heron/Halkheda	*Ardea cinerea* (Linnaeus, 1758)	RW	LC	O (1a, 2c, 3a, 4a, 4b, 5b, 7b)
Ardeidae	Purple Heron/Azan	*Ardea purpurea* (Linnaeus, 1766)	R	LC	O (1a, 3a, 4a, 4b,5b)
Ardeidae	Intermediate Egret/Maju bog	*Mesophoyx intermedia* (Wagler, 1827)	R	LC	C (1a, 1c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 7b, 8a, 8b, 8c, 9a, 9b, 9c)
Ardeidae	Great Egret/Bor bog	*casmerodius albus* (Linnaeus, 1758)	RW	LC	O (1a, 1b, 3a, 4a, 4b)
Ardeidae	Cinnamon Bittern/Itaguriya sorai	*Ixobrycgus cinnamomeus* (Gmelin, 1789)	r	LC	U (1a, 3a)
Ardeidae	Indian Pond Heron/Konamusuri	*Ardeola grayii* (Sykes, 1832)	R	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 7c, 8a, 8b, 8c, 9a, 9b, 9c)
Ardeidae	Striated Heron/Soru musori	*Butorides striatus* (Linnaeus, 1758)	r	LC	U (1a, 3a, 4a, 4b, 5c, 6a)
Ardeidae	Cattle Egret/Gu Bog	*Bubulcus ibis* (Linnaeus, 1758)	R	LC	C (1b, 1c, 2b, 3a,3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6b, 6c, 7a, 7b, 7c,8a, 8b, 8c, 9a, 9b, 9c)
Ardeidae	Little Egret/Teteri bog	*Egretta garzetta* (Linnaeus, 1766)	R	LC	C (1a, 1b, 2b, 3a, 4b, 5c,7b, 8a, 8b, 8c, 9a, 9b, 9c)
Phalacrocoracidae	Little Cormorant/Pani Kawri	*Microcarbo niger* (Vieillot, 1817)	R	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 8a, 8b, 8c, 9a, 9b, 9c)
Phalacrocoracidae	Indian Cormorant/Koilangi	*Phalacrocorax fuscicollis* (Stephens, 1826)	R	LC	S (1a, 4b, 6b)
Phalacrocoracidae	Great Cormorant/Doikola	*Phalacrocorax carbo* (Linnaeus, 1758)	RW	LC	O (1a, 3a, 4a, 4b, 6b)
Pelecanidae	Spot-billed pelican/Vela sorai	*Pelecanus philippensis* (Gmelin, 1789)	R	NT	S (1a)
Anhingidae	Oriental darter/Moniyori	*Anhinga melanogaster* (Pennant, 1769)	R	NT	O (1a, 3a, 3b, 4a, 4b, 6b)
Hirundinidae	Barn swallow/Teltupi	*Hirundo rustica* (Linnaeus, 1758)	RW	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6b, 6c, 7a, 7b8b, 8c, 9a, 9b, 9c)
Accipitridae	Pallas's fish eagle/Bor ukoh	*Haliaeetus leucoryphus (*Pallas, 1771)	r	EN	S (1 b)
Accipitridae	Grey-headed fish eagle/Ukoh	*Haliaeetus icthyaetus* (Horsfield, 1821)	r	NT	U (1a, 3a, 4b)
Accipitridae	Osprey/Kuruwa	*Pandion haliaetus* (Linnaeus, 1758)	rw	LC	O (1a, 3a, 4a, 4b)
Charadriidae	River lapwing/Balighura	*Vanellus duvaucelli* (Lesson, 1826)	R	NT	U (5c, 7b,)
Charadriidae	Red-wattled lapwing/Hotitiya	*Vanellus indicus* (Boddaert, 1783)	R	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 8a)
Charadriidae	Grey-headed lapwing/Dolghura	*Vanellus cinereus* (Blyth, 1842)	w	LC	U (1a, 3a, 4a, 4b, 4c, 6a, 6b, 7b)
Charadriidae	Northern Lapwing/Silghura	*Vanellus vanellus* (Linnaeus, 1758)	w	NT	S (1a, 4b, 8c)
Charadriidae	Little ringed plover/Loriyoli	*Charadrius dubius* (Scopoli, 1786)	RW	LC	O (1a, 3b, 5c, 7b, 8c)
Burhinidae	Great thick-knee/Dangor silkotora	*Esacus recurvirostris* (Cuvier, 1829)	r	NT	S (5c)
Burhinidae	Indian thick-knee/Silkotora	*Burhinus indicus* (Salvadori, 1865)	R	LC	S (1b)
Jacanidae	Bronze-winged jacana/Dolpunga	*Metopidius indicus* (Latham, 1790)	R	LC	C (1a, 1b, 1c, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6b, 6c, 7a, 7b 8a, 8c, 9a)
Jacanidae	Pheasant-tailed jacana/Dolmora	*Hydrophasianus chirurgus* (Scopoli, 1786)	R	LC	S (1a, 3a)
Rostratulidae	Common snipe/Balituka	*Gallinago gallinago* (Linnaeus, 1758)	rW	LC	S (1a, 3a, 6a)
Rostratulidae	Greater painted snipe/Rongsongia bali khusora	*Rostratula benghalensis (Linnaeus, 1758)*	W	LC	S (6a)

Scolopacidae	Green Sandpiper/Bali Boguwa	*Tringa ochropus* (Linnaeus, 1758)	W	LC	S (1a, 6a)
Scolopacidae	Common Greenshank/Pat thengi	*Tringa nebularia* (Gunnerus, 1767)	W	LC	U (1a, 3a, 4a, 4b)
Scolopacidae	Little stint/Chereka sorai	*Calidris minuta* (Leisler, 1812)	W	LC	U (1a, 2a,3a, 6a)
Scolopacidae	Temminck's stint/Not found	*Calidris temminckii* (Leisler, 1812)	W	LC	U (2a, 6a)
Scolopacidae	Common Sandpiper/Bali khusora	*Actitis hypoleucos* (Linnaeus, 1758)	sW	LC	U (1a, 4b)
Laridae	Black-headed gull/Kalfut sagor siloni, Ram paro	*Chroicocephalus ridibundus* (Linnaeus, 1766)	R	LC	S (1a, 3a)
Rallidae	River tern/Gonga-siloni	*Sterna aurantia* (Gray, 1831)	R	NT	S (1a, 3a, 4a,4b)
Rallidae	Water Rail/Dolsora	*Rallus aquaticus* (Linnaeus, 1758)	rw	LC	S (1a, 4b, 7b)
Rallidae	White-breasted waterhen/Dauk	*Amaurornis phoenicurus* (Pennant, 1769)	R	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6b, 6c, 7a, 7b, 8a, 8b, 8c, 9a, 9b, 9c)
Rallidae	Purple Swamphen/Kam sorai	*Porphyrio porphyrio* (Linnaeus, 1758)	R	LC	S (4a)
Phasianidae	Swamp Francolin/ Hoikoli	*Francolinsus gularis* (Temminck, 1815)	r	VU	S (1a, 6a)
Rallidae	Eurasian coot/Nol Dhekor	*Fulica atra* (Linnaeus, 1758)	RW	LC	S (1a)
Rallidae	Common Moorhen/Desi kura dhekor	*Gallinula chloropus* (Linnaeus, 1758)	R	LC	O (1a, 1c)
Muscicapidae	Black-backed forktail/Ketepa tip	*Enicurus immaculatus* (Hodgson, 1836)	r	LC	O (1a, 6a)
Motacillidae	White wagtail/Boga Balimahi	*Motacilla alba* (Linnaeus, 1758)	rW	LC	C (1a, 1b, 1c, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6b, 6c, 7a, 7b, 8a, 8b, 8c, 9a, 9b, 9c)
Motacillidae	Cristine wagtail/Balimahi	*Motacilla citreola* (Pallas, 1776)	rW	LC	C (1a, 1b, 1c, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5c, 6b, 7b, 8c, , 9c)
Alcedinidae	White-breasted Kingfisher/Boga bukuwa masruka	*Halcyon smyrnensis* (Linnaeus, 1758)	R	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 8a, 8b, 8c, 9a, 9b. 9c)
Alcedinidae	Blue-eared kingfisher/Nila masruka	*Alcedo meninting* (Horsfield, 1821)	r	LC	S (1b)
Alcedinidae	Lesser Pied Kingfisher/Pokhora masruka	*Ceryle rudis* (Linnaeus, 1758)	R	LC	U (1a, 3a,3b, 8c)
Alcedinidae	Stork-billed Kingfisher/Bor thutia masruka	*Pelargopsis capensis* (Linnaeus, 1766)	R	LC	U (1a, 2a, 2b, 3a, 4a, 6a, 7b)
Alcedinidae	Ruddy Kingfisher/Rongosuwa Masruka	*Halcyon coromanda* (Latham, 1790)	r	LC	U (6a)
Alcedinidae	Common Kingfisher/Masruka	*Acedo atthis* (Linnaeus, 1758)	R	LC	O (1a, 2b, 3a, 3b, 3c, 4a, 4b, 6a, 7b)

Table 5. List of fishes found in wetlands of Biswanath, Assam, India

Family	English name/Vernacular name	Scientific name	Threat status	Occurrence
Cyprinidae	Kuria labeo/Kurhi	*Labeo gonius* (Hamilton, 1822)	LC	C (1a, 1c, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 5c, 6b, 6c, 7a, 7b)
Cyprinidae	Bata/Kuriha	*Labeo bata* (Hamilton, 1822)	LC	C (1a, 2b, 3b, 4b, 5c)
Cyprinidae	Black rohu/Mali	*Labeo calbasu* (Hamilton, 1822)	LC	O (1a, 1c, 2b, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 6c, 7b)
Cyprinidae	Rohu/Row	*Labeo rohita* (Hamilton, 1822)	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 6b, 6c, 7a, 7b, 8c, 9b)
Cyprinidae	Catla/Bahu	*Catla catla* (Hamilton, 1822)	LC	C (1a, 1b, 1c, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 6b, 6c, 7a, 7b, 8c, 9b)
Cyprinidae	Spotfin swamp barb/Puthi	*Puntius sophore* (Hamilton, 1822)	LC	C (1a, 1c, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 6b, 6c, 7a, 7b, 8c, 9b)
Cyprinidae	Ticto barb/Chenaputhi	*Puntius tico* (Hamilton, 1822)	LC	O (1a, 1c, 3a, 3b, 4a, 4b. 5b, 7b)
Cyprinidae	Swamp barb/Sela puthi	*Puntius chola* (Hamilton, 1822)	LC	C (1a, 1c, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 5c, 6b, 6c, 7a, 7b)
Cyprinidae	Java barb/Java Puthi	*Puntius javanica* (Bleeker, 1850)	LC	O (1c, 2c, 3a, 3b, 4a, 5a, 5b, 7a)
Cyprinidae	Olive barb/Cheni puthi	*Puntius sarana* (Hamilton, 1822)	LC	C (1a, 1c,2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 6b, 6c, 7a, 7b, 8c, 9b)
Cyprinidae	Mrigal carp/Mirika	*Cirrhinus mrigala* (Bloch, 1795)	LC	C (1a, 1c, 2a ,2b, 2c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 6b, 6c, 7a, 7b, 8c, 9b)
Cyprinidae	Indian flying barb/Darikana	*Esomus danricus* (Hamilton, 1822)	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 8c, 9b)
Cyprinidae	Cabdio morar/Boliora	*Aspidoparia morar* (Hamilton, 1822)	LC	O (5c)
Cyprinidae	Reba carp/Lachim bhangun	*Cirrhinus reba* (Hamilton, 1822)	LC	O (2a, 5b, 6b, 6c)
Cyprinidae	Common carp/Common Carp	*Cyprinus carpio* (Linnaeus, 1758)	VU	C (2a, 5b, 5c, 6b, 6c)
Cyprinidae	Large razorbelly minnow/Chela	*Salmostoma bacaila* (Hamilton, 1822)	LC	C (2a, 5b, 6b, 6c)
Cyprinidae	Queen loach/Botuk	*Botia dario* (Hamilton, 1822)	LC	C (1a, 1c, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 6b, 6c, 7a, 7b, 8c, 9b)
Cyprinidae	Mola carplet/Moa	*Amblypharyngodon mola* (Hamilton, 1822)	LC	C (1a, 1c, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 5c, 6b, 6c, 7a, 7b)
Anabantidae	Climbing Perch/kawoi	*Anabas testudineus* (Bloch, 1792)	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 8c, 9b)
Channidae	Snakehead species/Goroi	*Channa punctata* (Bloch, 1793)	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 8c, 9b)
Channidae	Great snakehead/Sal	*Channa marulius* (Hamilton, 1822)	LC	O (1a, 2b, 3a, 3b, 4a, 4b, 6a)
Channidae	Striped snakehead/Sol	*Channa striatus* (Bloch, 1793)	LC	O (1a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c,6a, 6c, 7a)
Bagridae	Tengara catfish/Dangor Singora	*Mystus tengara* (Hamilton, 1822)	LC	C (1a, 1b, 1c, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 6b, 6c, 7a, 7b)
Bagridae	Gangetic mystus/Ganga singora	*Mystus cavasius* (Hamilton, 1822)	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b)
Bagridae	Striped dwarf catfish/Soru Singora	*Mystus vittatus* (Bloch, 1794)	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 8c, 9b)
Siluridae	Helicopter catfish or wallago catfish/Borali	*Wallago attu* (Bloch & Schneider, 1801)	VU	U (1a, 1b, 1c, 2b, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6c, 7a, 7b, 8c, 9b)
Siluridae	Butter catfish/Pabho	*Ompok bimaculatus* (Bloch, 1794))	NT	U (1a, 3b, 4b, 5c)
Pangasiidae	Basa/Bosa	*Pagasius bocourti* (Sauvage, 1880)	LC	O (1a, 5c)
Heteropneustidae	Fossil cat/Singi	*Heteropneustes fossolis* (Bloch, 1794)	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c)
Notopteridae	Indian Knifefish/Chital	*Chitala chitala* (Hamilton, 1822)	NT	O (1a, 1b, 2b, 2c, 3a, 3c, 4a, 4b, 5b, 6c, 8c, 9b)
Notopteridae	Bronze featherback/Kandhuli	*Notopterus notopterus* (Pallas, 1769)	LC	C (1a, 1b, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 6b, 6c, 7a,7b)
Clupeidae	Indian river shad/Koroti	*Gudusia chapra* (Hamilton, 1822)	LC	O (1a, 1c, 3a, 3b, 4a, 4b. 5b, 7b, 9c)
Synbranchidae	Swamp eels/Kuchia	*Monopterus cuchia* (Lacepede, 1800)	LC	C (1a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6c, 7a, 7b)
Synbranchidae	Barred spiny eel/Tora	*Macrognathus puncalus* (Hamilton, 1822)	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b)
Mastacembelidae	One-stripe spiny eel/Tura	*Macrognathus aral* (Bloch & Schneider, 1801)	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 6a, 6b, 6c, 7a, 7b)
Mastacembelidae	Zig-zag eel/Bami	*Mastacembelus armatus* (Lacepede, 1800)	LC	O (1a, 1b, 2b, 3a, 3b, 4a, 4b, 4c, 6a , 7b)
Nandidae	Gangetic leaffish/Gedgedi	*Nandus nandus* (Hamilton, 1822)	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 6a, 6b, 6c, 7a, 7b, 8c, 9b)
Botiidae	Guntea loach/Botia	*Lepidocephalus guntea* (Hamilton, 1822)	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 6a, 6b, 6c, 7a, 7b)
Schilbeidae	Gangetic alia/Kajuli	*Ailia coila* (Hamilton, 1822)	NT	U (4a, 4b, 5b)
Clariidae	Walking catfish/Magur	*Clarias batrachus* (Linnaeus, 1758)	LC	O (1a, 1b, 1c, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 6a, 6b, 6c, 7a, 7b, 8c, 9b)
Ambassidae	Chanda beculis/Chanda	*Parambassis baculis* (Hamilton, 1822)	LC	C (1a, 1b, 1c, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 6a, 6b, 6c, 7a, 7b, 8c, 9b)
Ambassidae	Elongate glassy perchlet/Chanda	*Chanda nama* (Hamilton, 1822)	LC	C (1a, 1b, 1c, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 6a, 6b, 6c, 7a, 7b, 8c, 9b)
Badidae	Blue badis/Nabat	*Badis badis* (Hamilton, 1822)	LC	C (2b, 4a, 4b, 7b)
Gobiidae	Tank Gobi/Patitmutura	*Glossogobius giuris* (Hamilton, 1822)	LC	U (1a, 2b, 2c, 3a, 3b, 4a,4b, 4c, 6a, 6c, 7b, 8c, 9b)
Osphronemidae	Striped gourami/Kholiana	*Colisa fasciatus* (Bloch & Schneider, 1801)	LC	O (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 5a, 5b, 6a, 6b, 6c, 7a, 7b, 8c, 9b)
Tetraodontidae	Ocellated pufferfish/Gongatup	*Tetraodon cutcutia* (Hamilton, 1822)	LC	O (1a, 2b, 3a, 3b, 4a, 4b)
Belonidae	Freshwater garfish/Kokila	*Xenentodon cancila* (Hamilton, 1822)	LC	C (1a, 1c, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b,5c , 6b, 6c, 7a, 7b)

Table 6. List of amphibians found in wetlands of Biswanath, Assam, India

Family	English name/Vernacular name	Scientific name	Threat status	Occurrence
Dicroglossidae	Indian bullfrog/Bamun vekula	*Hoplobatrachus tigerinus* (Daudin, 1803)	LC	O (1a, 3a, 4b, 4c, 6a, 8c)
Dicroglossidae	Pierre's cricket frog	*Zakerana pierrei* (Dubois, 1975)	LC	S (1a, 6a)
Dicroglossidae	Terai cricket frog	*Zakerana teraiensis* (Dubois, 1984)	LC	O (1a, 6a, 5c, 6b, 8c, 9b)
Dicroglossidae	Long-legged cricket frog	*Zakerana syhadrensis* (Annandale, 1919)	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b 6c, 7a, 7b, 7c, 8a, 8b, 8c, 9b)
Dicroglossidae	Indian skipper frog/Pani beng	*Euphlyctis cyanophlyctis* (Schneider, 1799)	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b)
Bufonidae	Common Indian Toad/Suk vekuli	*Duttaphrynus melanostictus* (Schneider, 1799)	LC	C (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c, 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b 6c, 7a, 7b, 7c, 8a, 8b, 8c, 9a, 9b, 9c)
Rhacophoridae	Four lined tree frog/Pat beng	*Polypedates leucomystax* (Gravenhorst, 1829)	LC	S (1a, 3a, 5c, 6a, 7a)

Table 7. List of reptiles found in wetlands of Biswanath, Assam, India

Family	English name/Vernacular name	Scientific name	Threat status	Occurrence
Varanidae	Asian water Monitor Lizard/Pani gui	*Varanus salvator* (Laurenti, 1768)	LC	S (1a, 6a)
Typhlopidae	Brahminy blind snake/Soru dola sap	*Indotyphlops braminus* (Daudin, 1803)	LC	O (1a, 1b, 1c, 2b, 2c, 3a, 3b, 4a, 4c, 5a, 5b, 5c, 6a, 7a, 7b, 8a, 8c, 9b)
Typhlopidae	Large blind Snake/dangor dola sap	*Argyrophis diardii* (Schlegel, 1839)	LC	U (3a, 4b, 5c)
Colubridae	Checkered keelback/Dhura sap	*Xenochrophis schnurrenbergeri* (Schneider, 1799)	LC	C (1a, 1c, 2b, 3a, 3b, 4a, 4c, 5a, 5c, 6c, 7b, 9b)
Colubridae	Red-necked keelback/Gum sap	*Rhabdophis subminiatus* (Schlegel, 1837)	LC	O (1a, 6a, 5c, 8b)
Colubridae	Striped Keelback	*Amphiesma stolatum* (Linnaeus, 1758)	LC	U (1a, 3a, 5a, 6a, 7b)
Pythonidae	Indian Python/Ajogor	*Python bivittatus* (Kuhl, 1820)	VU	U (2a, 5c, 6a)
Elapidae	Banded krait	*Bungarus fasciatus* (Schneider, 1801)	LC	S (1a, 5a, 6a, 8c)
Trionychidae	Black softshell turtle/Bormuriya kasso	*Nilssonia nigricans* (Anderson, 1875)	EW	S (2a, 7a)
Trionychidae	Indian peacock softshell turtle/Bor kasso	*Nilssonia hurum* (Gray, 1831)	VU	S (2a)
Trionychidae	Indian softshell turtle/Laomura kasso	*Nilssonia gangeticus* (Cuvier, 1825)	VU	U (2a, 4b)
Trionychidae	Indian flap shell turtle/Bagh dura	*Lissenys punctata* (Lacepede, 1788)	LC	U (2a, 7a)
Trionychidae	Assam leaf turtle/Kola shil dura	*Cyclemys gemeli* (Fritz, Guicking, Auer, Sommer, Wink & Hundsdörfer, 2008)	NE	S (2a)
Geoemydidae	Assam roofed turtle/Asomi dura	*Pangshura sylhetensis* (Jerdon, 1870)	EN	S (2a)
Geoemydidae	Indian roofed turtle/Futuki saliki dura	*Pangshura tecta* (Gray, 1831)	LC	S (2a)
Geoemydidae	Indian tent turtle/Saliki dura	*Pangshura tentoria* (Gray, 1834)	LC	U (1a, 2a)
Geoemydidae	Black pond turtle/Futuki Dura	*Geoclemys hamiltonii* (Gray 1830)	EN	S (2a)
Geoemydidae	Narrow-headed softshell turtle/ Baghia kasso	*Chitra indica* (Gray, 1831)	EN	S (8c)

Table 8. List of mammals found in wetlands of Biswanath, Assam, India

Family	English name/Vernacular name	Scientific name	Threat status	Occurrence
Mustelidae	Smooth-coated otter/Uud	*Lutrogale perspicillata* (Hilaire, 1826)	VU	S (1a, 5c)
Platanistidae	Ganges River Dolphin/Sihu	*Platanista gangetica* (Lebeck, 1801); (Roxburgh, 1801)	EN	S (5c)

In conclusion, Biswanath District of Assam, India hosts some of the ideal habitats for safeguarding the present biodiversity, the state holds. The reason behind is because the south boundary of the district is a part of the Kaziranga National Park, which forms a vast network of floodplains (grasslands and moist deciduous forests) hosting a vast range of habitats, and similarly the north of the district is covered by the foothills of Eastern Himalaya which spans across a long stretch of semi-evergreen forests. Apart from that, the major tributaries (Borgang and Buroi) of the river Brahmaputra have silted a vast expanse of lands in its boundaries which are converted into grasslands and wetlands, providing ample habitat for several dependent species. Moreover, the habitat heterogeneity, as well as the climate adds to the reasons. But the increasing human pressure has impacted severely the survival of the left habitats and in turn to the species. Agricultural expansion, illegal settlements, filling of lowlands, overfishing, conversion into fisheries, exploitation of the other resources, are the most important threats to the remaining wetlands.

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